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# Urban Transportation Abstracts

Summer 1984  
Volume 3 Number 1

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Urban Mass Transportation Research Information Service  
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# FOREWORD

This volume, which contains 960 abstracts of journal articles, research reports, and other information sources, along with 255 summaries of ongoing research activities, covers material accessioned by the Urban Mass Transportation Research Information Service (UMTRIS) between October 1983 and April 1984.

*Urban Transportation Abstracts*, published semiannually, contains material added to the UMTRIS magnetic-tape file during a 6-month interval prior to its publication. All issues of *Abstracts* should be retained since each contains only newly acquired abstract citations; certain of the ongoing research summaries are republished because they continue to be reported until the research projects they describe have been completed or terminated. Ongoing summaries are published only in the Summer issues; Winter issues contain only abstracts.

UMTRIS was developed within the National Research Council, Transportation Research Board (TRB), under contract to the Urban Mass Transportation Administration (UMTA), U.S. Department of Transportation. The UMTRIS computerized data system incorporates information on planning, designing, maintaining, operating, managing, and financing of all modes of public transit, including bus, trolley bus, light and heavy rail transit, commuter rail, advanced guideway systems, taxi and vanpool services, ferries, and local air services. The information is selected because it is seen as useful to operators, designers, researchers, planners, and government agencies at all levels. Sources are worldwide, although the majority of citations are of U.S. origin.

The concepts used by UMTRIS are similar to those of the other TRB modal operations—Highway Research Information Service, Railroad Research Information Service, Maritime Research Information Service, and Air Transport Research Information Service. Collectively, these operations plus UMTRIS are designated the Transportation Research Information Services (TRIS).

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## Using Urban Transportation Abstracts

This volume is divided into three major sections

- Abstracts of documents,
- Summaries of ongoing research,
- Indexes by source, author, and subject.

If you are interested in reviewing reports of completed research and other published documents, turn to the section,

Abstracts of Reports and Journal Articles, beginning on page 1. The material in this section is arranged in the UMTRIS categories (i.e., Rail Vehicle Technology, Fares and Pricing, Paratransit, Land Use). The category designation and its identifying number are listed in the Contents and appear at the top of each page of the pertinent section.

If you are interested in ongoing research projects, turn to the section, Summaries of Ongoing Research, beginning on page 168. It is important to remember that often there are no reports available; only when the heading References is followed by one or more citations is there a possibility of getting some published results from an ongoing research activity. The summaries are arranged by UMTRIS category, and the designation and appropriate number appear at the top of each page. An A after the numerical designation serves to identify the ongoing projects.

If you can identify your interest by a very specific subject term (i.e., Trolley Bus, New Austrian Tunneling Method, Automatic Fare Collection, Handicapped Persons), turn to the Retrieval Term Index starting on page 242. Each term in this index is followed by one or more document record numbers, each of which consists of the two-digit category designation and the six-digit TRIS accession number that identifies the individual document record within that category. Any listing in italics indicates that the citation is a research summary and appears in the A section. In either the Abstracts or Summaries section, the citations are arranged in order of ascending accession numbers within any category.

If you are looking for abstracts of articles or reports produced by a specific author or summaries of projects being conducted by a particular investigator, turn to the Author Index, page 232, and look for the individual's surname in the alphabetized listing. Again the document record number is used to find the citation in the Abstracts or Summaries section.

If you are interested in abstracts of articles or reports that appeared in a particular publication or were the work of a specific publisher, or if you are interested in summaries of research projects being conducted or funded by a specific organization, turn to the Source Index, page 219. Again, use the document record number to find the appropriate citation in the Abstracts or Summaries section.

Although the Term Index gives a general idea of the scope of the UMTRIS indexing system, information is available on many other terms that do not appear in this specific edition. A complete subject term listing is planned for future publication.

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The UMTRIS file is maintained on magnetic tape and is available for literature searches of information related to specific inquiries. The key to searching is UMTRIS categories, appropriate subject terms, dates, performing agencies, or

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The fee schedule for UMTRIS title searches reflects the primary support for the service from UMTA and the non-profit nature of all National Research Council information services. The charge for computer retrieval from the UMTRIS file is \$50 per request plus \$0.25 per citation after screening by UMTRIS. A written authorization or purchase order is required before the retrieval is made. Contact UMTRIS

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desired. When ordering from the National Technical Information Service, be sure to give the NTIS accession number as well as title and other information. A loan and photocopy service for many of the articles and papers cited is operated by six transportation libraries as explained on page viii. Documents published outside the United States are usually written in the language of the country of origin as indicated at the end of the abstract. If a translation is desired, consult the National Translations Center listed below, which maintains a registry of translations. If the document has never been translated, contact translation services listed in the yellow pages of the telephone book in metropolitan areas.

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# ABBREVIATIONS

**AAR** Association of American Railroads  
**AIAA** American Institute of Aeronautics and Astronautics  
**AREA** American Railway Engineering Association  
**ASCE** American Society of Civil Engineers  
**CIGGT** Canadian Institute of Guided Ground Transport  
**CNR** Canadian National Railways  
**DOT** U.S. Department of Transportation  
**DOTL** U.S. Department of Transportation Library,  
Washington, D.C.  
**ECMT** European Conference of Ministers of Transport  
**EI** Engineering Index  
**ESL** Engineering Societies Library  
**FHWA** Federal Highway Administration,  
**Fig** Figures  
**FRA** Federal Railroad Administration  
**FY** Fiscal Year  
**GMRL** General Motors Research Laboratories  
**GPO** U.S. Government Printing Office  
**HRIS** Highway Research Information Service, Transportation  
Research Board  
**HSRI** Highway Safety Research Institute  
**HUD** U.S. Department of Housing and Urban Development  
**IEEE** Institute of Electrical and Electronics Engineers  
**IPC** IPC Transport Press, Ltd.  
**IRCA** International Railway Congress Association  
**IRF** International Road Federation  
**IRRD** International Road Research Documentation  
**ITS** Institute of Transportation Studies  
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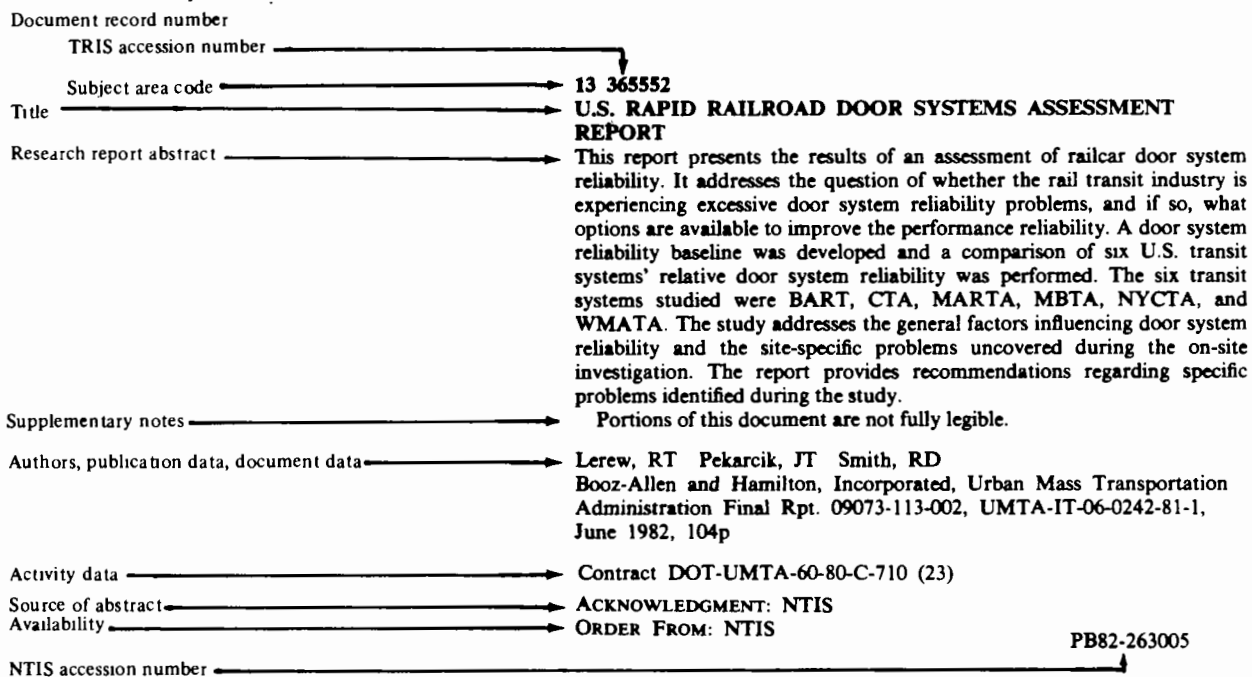
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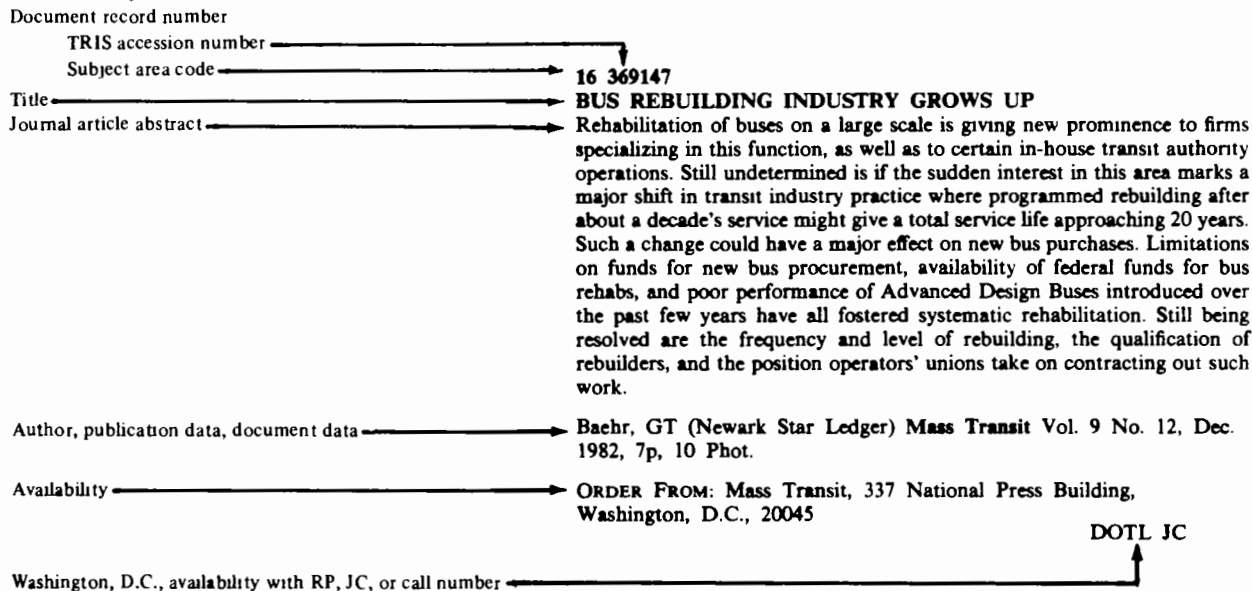
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search Summaries. Within each category the citations are published in rising accession number order, although these numbers usually will not be consecutive. Examples of a research report abstract and journal article abstracts from U.S. and non-U.S. sources are illustrated, along with a summary of an ongoing research project. In each case the important data elements are indicated.

## Abstract of a research report



## Abstract of a U.S. journal article



**Abstract of a non-U.S. journal article**

Document record number  
 TRIS accession number  
 Subject area code

16 369865

Translated title → MAINTENANCE OF MICROELECTRONIC INSTALLATIONS IN RAIL VEHICLES BY AID OF SELF-DIAGNOSIS  
 [INSTANDHALTUNG MIKROELEKTRONISCHER EINRICHTUNGEN IN SCHIENENFAHRZEUGEN MIT INTERSTUETZUNG DURCH EIGENDIAGNOSE]

Title in original language →

Journal article abstract → Microelectronic self-diagnosis offers new possibilities for the maintenance of complex electronic installations. After some basics on microelectronics, a description is given of practical applications for the diagnosis and maintenance of electronics.

Language of full-text article → [German]

Author, publication data, document data → Schultes, G Stamm, J *Elektrische Bahnen* Vol. 79 No. 9, Sept. 1981, pp 318-325

Source of abstract → ACKNOWLEDGMENT: EI

Availability → ORDER FROM: ESL

Washington, D.C., availability with RP, JC, or call number → DOTL JC

The summaries of ongoing research describe research activities currently in progress or recently completed. Each summary indicates who is performing the project, who is funding it, and how the research goal is to be attained. A summary is not a document surrogate; that is, there may not

be a full report published on the project. The summaries are in the format shown below, although each one may not contain all the elements given in this sample. The document record numbers and the order listing are the same for both summaries and abstracts.

**Summary of ongoing research**

Document record number  
 TRIS accession number  
 Subject area code

17 372987

Project title → HOMOPOLAR LINEAR SYNCHRONOUS MOTORS (HLSM) INVESTIGATION

Project summary → Objective: to carry out an assessment of the HLSM as a potential alternative drive to the linear induction motor (LIM) for an intermediate capacity transit system (ICTS) scope: 1) conduct comprehensive review of the state-of-knowledge of HLSM's and assess analytic approaches; 2) define a design specification for the HLSM based on ICTS LIM propulsion requirements; 3) develop analytical techniques to assess motor design performance; 4) conduct design study and evaluate performance achievements of proposed design; Project Summary: 5) evaluate control schemes to optimize performance; 6) make preliminary design of test motor; 7) investigate manufacturing capabilities and estimate cost of motor; and 8) conduct an HLSM system evaluation as a replacement to the LIM system in the ICTS application.

Agency performing the work → PERFORMING AGENCY: Canadian Institute of Guided Ground Transport, PRO-096

Project investigators → INVESTIGATOR: Eastham, AR Tel (613) 547-5777 Dawson, DG Atherton, D Slemon, G

Project sponsor → SPONSORING AGENCY: Transportation Development Center

Contract monitor → Contract OSD82-00047

Project data → STATUS:Active NOTICE DATE:May 1983  
 START DATE:June 1982  
 COMPLETION DATE:Sept. 1983 Total Funds:\$106,355

Source of this summary → ACKNOWLEDGMENT: CIGGT

## Abstracts of Reports and Journal Articles

**11 380124****THE INFLUX CONTINUES**

In less than a decade the number of foreign-based bus manufacturers participating in the 40-ft and up bus market in the U.S. has gone from 2 to 10. While recent changes extended Buy America provisions in the federal mass transportation capital assistance program, foreign builders are finding ways to comply with the requirements.

**Metro** Vol. 79 No. 6, Oct. 1983, 5p, 1 Phot.

ORDER FROM: Bobit Publishing Company, 2500 Artesia Boulevard, Redondo Beach, California, 90278

**11 380125****TAKE MY SEAT, PLEASE**

Assurance of comfort and safety in seating for all types of transit vehicles is achieved by design and testing. Tests applied by a major manufacturer are described; general design features of other makers are also listed. Seats are tested dynamically and statically. There are impact and vibration tests, along with checks on flammability and smoke production.

**Metro** Vol. 79 No. 6, Oct. 1983, 6p, 8 Phot.

ORDER FROM: Bobit Publishing Company, 2500 Artesia Boulevard, Redondo Beach, California, 90278

**11 380145****VEHICLE DESIGN, ACCEPTANCE TESTING, AND MAINTENANCE SUPPORT SERVICES: RESOURCE PAPER**

The author traces the history of bus technology, noting that the 1959 GMC New Look model marked the end of major mechanical innovation in transit buses; starting with NL emphasis has been on improved environment for drivers and passengers. Then the entry of the federal government into capital funding during the NL period made first cost the overwhelming determinant of bus suppliers. Next federal sponsorship of the Transbus program produced models with increased passenger comfort that were marked by high maintenance costs. In 1975 GMC formally introduced its RTS model with some Transbus features, followed by the Flexible 870 designed in much the same way. Attempts to reconcile specifications for these two Advanced Design Bus models produced the so-called White Book. Both ADBs are heavier, more costly and less reliable than their predecessors. Poor performance of ADBs has resulted in changed transit bus procurement. Foreign builders have entered the market and major remanufacturing programs for NL buses undertaken. The author sees the need for enhanced maintenance information systems, detailed specifications that will assure reliable, efficient buses, and adequate testing. Competition ultimately will give proper equipment.

This paper appeared in Transportation Research Board Special Report 198: Bus Maintenance Improvement; Proceedings of the Bus Maintenance Improvement Workshop, April 14-16, 1982, St. Louis, Missouri.

Buckel, HH (Booz-Allen and Hamilton, Incorporated) **Transportation Research Board Special Report** No. 198, 1983, pp 47-51, 6 Fig., 1 Tab.

ORDER FROM: TRB Publications Off

**11 380146****VEHICLE DESIGN, ACCEPTANCE TESTING, AND MAINTENANCE SUPPORT SERVICES: WORKSHOP REPORT**

The author reports that changes in bus design have caused serious maintenance problems. Increased sophistication requires higher levels of preventive maintenance, increases difficulty in diagnosing failures, and requires time-consuming repairs. There are deficiencies in vehicle design, some being the subject of UMTA-funded studies and others the target of retrofit programs. The workshop group attempted to identify solutions of these design problems, including the following: Improved reliability and maintainability through specifications and design; guidelines for writing specifications; development of prequalification tests for components; identification and upgrading of problem components; pursue latent defects, particularly during warranty period; improve quality control; increased manufacturer technical support; use of life-cycle costing procedures; utilize fuel-economy test measurements.

This paper appeared in Transportation Research Board Special Report 198: Bus Maintenance Improvement; Proceedings of the Bus Maintenance Improvement Workshop, April 14-16, 1982, St. Louis, Missouri.

**Transportation Research Board Special Report** No. 198, 1983, pp 51-52

ORDER FROM: TRB Publications Off

**11 380184****EVALUATION OF RETARDERS FOR TRANSIT BUSES**

The increased weight, higher speeds and use of softer brake-lining materials have resulted in Advanced Design buses (ADSs) achieving lower brake-lining life than the earlier New Look Buses. A vehicle retarder, when actuated, provides an auxiliary and independent braking system for absorbing a portion of the kinetic energy of a decelerating bus. By sharing braking with the service brake system, the retarder results in cooler brakes and increased lining life. Michigan DOT tested 3 types of retarders (engine brake, hydraulic and electric) on buses of the transit systems in Detroit, Grand Rapids and Lansing where they were operated on equivalent routes with buses not so equipped. Measurement of lining life and data on maintenance were compiled. It was shown that the engine brake retarder increased brake lining life by up to 1.65 times and the hydraulic and electric retarders achieved 4 to 6 times better lining life. Assuming a 12-year bus life, retrofits would provide net savings of \$19,000 to \$40,000 per bus. Availability would also be increased. Retarders are adaptable to the ADBs and do provide substantial brake maintenance savings.

Boctor, K

Michigan Department of Transportation, Urban Mass Transportation Administration Intrm Rpt. UMTA-MI-06-0025-83-1, June 1983, v.p., Figs., Tabs.

ORDER FROM: TSC

**11 380185****UPDATED RELIABILITY EVALUATION OF V730 TRANSMISSION**

The Detroit Diesel Allison V730 automatic, 3-speed transit bus transmission has had a generally unfavorable performance since its introduction in 1976. A preliminary study by TSC of problems encountered and the effectiveness of corrective measures was described in a 1982 UMTA Technology Sharing report. Since then, a reasonable amount of operating time has been accumulated on units incorporating a number of corrective

design modifications. Data indicates a general and significant improvement in reliability. Southern California Rapid Transit District has data showing a high proportion of the transmissions yet have to sustain their first failure even after an average of 75,000 miles. This is in contrast to the premature onset of failures in the early transmissions discussed in the 1982 report. The extended data and the analysis are included.

Seekell, F

Transportation Systems Center, Urban Mass Transportation Administration DOT-TSC-UMTA-83-33, July 1983, v.p., 4 Fig., 2 Tab.

ORDER FROM: TSC

#### 11 380198

##### FUEL CELL SYSTEMS FOR VEHICULAR APPLICATIONS

The phosphoric acid fuel cell is used as the base line in these evaluations. Two cell sizes (15 and 60 kW) and two fuel options (methanol and propane) are included. Four vehicle types, the city bus, highway bus, delivery van, and general-purpose consumer car are selected for evaluation. Typical drive cycles and economics for these vehicles are compiled, and comparisons are made between the fuel-cell vehicle and current internal-combustion and diesel-engine vehicles. The conclusions of these evaluations are briefly related. Then, the initial results of two aspects of the fuel-cell-powered vehicle evaluation program ongoing at LASL are described. The first part of the program presents the results of detailed computer simulations to illustrate a number of the important system-design considerations in configuring a fuel cell/battery electric vehicle. The next program describes a fuel-cell-powered golf cart currently being used as an engineering test bed.

SAE Automotive Engineering Congress and Exposition, Detroit, Michigan, 25 February 1980.

Lynn, DK McCormick, JB Bobbett, RE Kerwin, WJ Derouin, C Los Alamos Scientific Laboratory, Department of Energy CONF-800202-2, 1980, 30p Contract W-7405-ENG-36

ORDER FROM: NTIS

#### 11 380214

##### USING THE TRACK AS A ROAD [NUTZUNG DER SCHIENE ALS STRASSE]

Buses cater for 50% of short-distance passenger traffic, but their advantages (i.e. flexibility and economy) decrease when they have to share available space with private cars. Hence the development of an automatically-guided bus operating on its own right of way. A test line on which tramways and buses can be worked simultaneously, has been built for the purpose. To offset the damping effect of a rail track on a rigid road, a system has been devised whereby the running plates are laid directly on sleepers. [German]

Feldhaus, K-H *Verkehr und Technik* Vol. 36 No. 5, May 1983, pp 157-163, 14 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: Schmidt (Erich) Verlag, Herforder Strasse 10, 4800 Bielefeld, West Germany

#### 11 380791

##### WE DRIVE THE O-BAHN

The South Australian O-Bahn guided busway project was recently examined by *Truck and Bus Transportation* magazine. The journal's SA correspondent provides technical details of the busway components and the vehicles designed for O-Bahn operation. Comments are offered in respect of the busway characteristics, vehicle design, noise level and riding qualities, safety features and likely public reaction towards the project, particularly in respect of attracting ridership to the system.

Hammond, I *Truck and Bus Transportation* Apr. 1983, n.p.

ACKNOWLEDGMENT: ATLAS Bulletin

ORDER FROM: Shennen Publishing and Publicity Company, 64 Kippax Street, Surry Hills, New South Wales 2010, Australia

#### 11 380792

##### WARNING ON O-BAHN WHEELS

The vulnerability of buses fitted with O-Bahn equipment has recently been aired in Adelaide. The warnings issued to date cover both guideway and on-street running.

*Truck and Bus Transportation* Apr. 1983, p 114

ACKNOWLEDGMENT: ATLAS Bulletin

ORDER FROM: Shennen Publishing and Publicity Company, 64 Kippax Street, Surry Hills, New South Wales 2010, Australia

#### 11 380793

##### WORLD'S LONGEST O-BAHN FOR ADELAIDE

The first Mercedes-Benz bus for Adelaide's new O-Bahn system, the North-East Guided Busway, was unveiled in August 1982 by the South Australian Minister of Transport. When the Adelaide project becomes operational in 1986, it will be the world's second and longest O-Bahn Guided Bus System. Ninety buses are proposed for the guided busway, which will be capable of operating speeds of up to 100 kms hour. Information is provided on the design and construction of the proposed North-East Busway.

Schmidt, FH *Highway Engineering in Australia* Vol. 14 No. 4, Aug. 1982, n.p.

ACKNOWLEDGMENT: ATLAS Bulletin

ORDER FROM: Editorial and Publishing Consultants Pty Ltd, 29 First Avenue, Klemzig, South Australia 5087, Australia

#### 11 380833

##### LAYOUT OF A BUS IN RURAL AREAS FOR WHEELCHAIR USERS [INRICHTING VAN DE STREEKBUS VOOR ROLSTOELGEBRUIKERS]

In the Netherlands there are approximately 50000 disabled persons using wheelchairs having much difficulty in a society which is not instituted for such persons. Disabled persons should be treated in an equivalent way to other persons. The adaptation of a bus can lead to greater mobility and therefore to a better integration of the wheelchair user in the society. There are many kinds of wheelchairs. Design and size differ much mutually. The layout of a bus for wheelchairs is twofold (1) the location of the place for the wheelchair (2) the structure of the place for the wheelchair. Most wheelchair places are next to the entrance. The main point is the need for lifting equipment. An interview was held on the wishes and needs of wheelchair users. Thereafter a study was made at a bus factory to learn the technical point of view. Recommendations are presented for the layout of a bus in rural areas in which wheelchairs can be transported. Technical problems concerning the anchorage, entrance, location, etc., are considered. (TRRL) [Dutch]

Ruygers, J

Delft University of Technology Monograph 1983, 304p, Figs., Tabs., Photos., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 270653), Institute for Road Safety Research SWOV

ORDER FROM: Delft University of Technology, Netherlands, Tussenafdeling Industrieel Ontwerpen, Oude Delft 39A, Delft, Netherlands

#### 11 380855

##### TROLLEYBUS: TECHNICAL SPECIFICATIONS [TROLEIBUS]

The paper describes basic specifications of the vehicle, such as number of passengers, proportions, performance and subsystems. It shows details of the body, traction, transmission, rear axle, steering and suspension. It analyses the friction brake, independent system, secondary electric system and the remote control system. (TRRL) [Portuguese]

Companhia Municipal de Transportes Coletivos Mar. 1979, 127p, 23 Fig., 1 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 270706)

ORDER FROM: Companhia Municipal de Transportes Coletivos, Rua 13 de Maio, 1376, Sao Paulo, Sao Paulo, Brazil

#### 11 380875

##### DESIGN AND CONSTRUCTION GUIDE SERIES-BUS STOPS

In many cases the damaging effect of a bus on the bus stop pavement is significantly more than that of all traffic on the rest of the pavement. Heavy

vehicles start and stop from a similar point each time, consistent loading occurs close to the kerb and oil leakage damages bitumen based surfaces. Design guides are given for the construction of a concrete surface and for an interlocking concrete block pavement. Many situations will require the upgrading of an existing construction but the subgrade should have no hard spots. A sub-base is often the simplest way of providing uniform support and dealing with problems associated with the drainage beneath the slab. Some 200 mm thickness of concrete pavement of 25 mpa minimum strength at the time of opening with 5 to 6 per cent air entrainment is recommended. Transverse dowelled joints should be provided at 5 to 6 M centres. The full depth reconstruction of any flexible pavement adjoining the concrete slab should be carefully carried out. It is suggested that normal design methods for unbound granular pavements are used with interlocking concrete blocks assuming that the layer of blocks is equivalent to twice the thickness of the basecourse and the bedding sand is equivalent to the basecourse. (TRRL)

**New Zealand Concrete Construction** Vol. 27 May 1983, pp 25-26, 2 Fig., 1 Phot., 5 Ref.

**ACKNOWLEDGMENT:** TRRL (IRRD 271177)  
**ORDER FROM:** Concrete Publications, Securities House, 126 the Terrace, P.O. Box 3644, Wellington, New Zealand

**11 380879**  
**STATIC AND DYNAMIC TESTS OF WHEELCHAIR RESTRAINTS FOR USE IN PUBLIC SERVICE VEHICLES**

To make public transport more accessible to the wheelchair disabled the Department of Transport has issued code of practice and special provision for the carriage of wheelchairs on public service vehicles. The report considers the occupant protection aspects of the code. Accident data highlights the need to restrain wheelchairs during normal driving as well as in impacts which are most likely to be frontal. Some failures during the static tests of three different designs of wheelchair restraints demonstrated the need for a minimum strength standard. The test force levels given in the code of practice err on the side of safety and with experience may be reduced. The static test recommended by the code is for use in type approval testing and must not be used in equipment that is to continue in service. The test trolley will require modification for the testing of combined wheelchair/occupant restraints. Two designs of restraint were dynamically tested. Increasing the deceleration pulse above the psv 10 g level, emphasised rather than changed the mode of collapse of the wheelchair and at the higher g' levels resulted in failure of the combined restraint. (Author/TRRL)

Petty, SF Chatfield, AS  
 Transport and Road Research Laboratory, (0305-1293) LR 1087, 1983, 8p, 4 Fig., 1 Tab., 8 Ref.

**ACKNOWLEDGMENT:** TRRL (IRRD 271615)  
**ORDER FROM:** TRRL

**11 380881**  
**DESIGN TRENDS OF ARTICULATED BUSES**

The trend towards articulated buses has been steadily increasing in recent years in order to cope with the ever growing demand for public transport capacity. This paper presents a comparison of the three most widespread types of articulated bus: the conventional concept—horizontal under-floor axial engine at the front end with middle axle powered (type a); a concept with a high degree of unification—rear engine with third axle powered—the so-called "pusher" bus (type b); and a compromise concept—rear engine with middle axle powered (type c). The pusher concept appears to be the best for modern vehicle design from various viewpoints. Investigations into the vehicle dynamics of articulated buses have begun. (TRRL)

Vlk, F (Technical University of Brno, Czechoslovakia) **International Journal of Vehicle Design** Vol. 4 No. 6, Nov. 1983, pp 646-658, 11 Fig., 9 Ref.

**ACKNOWLEDGMENT:** TRRL (IRRD 271633)  
**ORDER FROM:** ESL

**11 381036**  
**INVESTIGATION OF THE APPLICABILITY OF A STORED HYDRAULIC ENERGY PROPULSION SYSTEM TO A CONVENTIONAL BUS**

The objective of this investigation was to determine the feasibility of using stored hydraulic energy propulsion (SHEP) technology in current transit buses, and to present an evaluation of the fuel savings and economic cost/benefits of the SHEP systems that are currently in the concept and hardware stages of development for transit coaches. The analysis included a determination of the current status of SHEP systems proposed or developed anywhere in the world. The costs and benefits resulting from the operation of the proposed systems were analyzed from actual and computer projected data by Booz, Allen using their transit coach computer simulation model. This report includes a description of the computer simulation model and an extensive list of reference pertinent to the report subject, as well as numerous charts depicting transmission systems, drive systems, and other hydraulic stored energy projection systems. This report presents the findings of an investigation of the applicability of using state-of-the-art hydraulic accumulator technology to regenerate braking energy in current transit buses. Two prototype systems, specifically applied to transit coaches were found to be currently under development in Europe: 1) Hydrobus II developed by the M.A.N. Corporation of Germany, and 2) Hybrid-Bus developed by the Technical University of Denmark. Two other systems were found to be applicable to transit coaches: 1) Inertial Storage Transmission System developed by Advanced Energy Systems of Portland, Oregon, and 2) A-Bus concept by Energy Research & Generation Inc., of Oakland, California.

Booz-Allen and Hamilton, Incorporated, Urban Mass Transportation Administration Final Rpt. UMTA-OR-06-0007-83-1, Sept. 1983, 129p

**ORDER FROM:** NTIS PB84-115021

**11 381446**  
**100 YEARS OF THE TROLLEYBUS [100 JAHRE OBUS]**

A detailed evaluation of the development of the trolleybus examines the advantages and disadvantages of this mode of urban public transport. A revival of interest in trolleybus development has followed new designs of electric traction and electronic control equipment, the threat to availability of hydrocarbon fuel supplies, and the flexibility of trolleybus transport. A number of developments in trolleybus design are discussed including the duo-bus trolleybus which incorporates two separate drive systems, the Daimler-Benz articulated trolleybus with electronic thyristor steering, the MAN/Siemans electrobus, and the O-Bahn Trolley-Tranin. The O-Bahn system, developed by Daimler-Benz, which relies on rail guidance and can be adapted for diesel and electric traction, is to be installed in Adelaide, South Australia. The paper was originally published in German in Strassbahn magazine, 1983. P230-235.

Pabst, M  
 Transport and Road Research Laboratory Library Translation, Sept. 1983, 12p, 5 Phot., 31 Ref.

**ACKNOWLEDGMENT:** TRRL (IRRD 272596)  
**ORDER FROM:** TRRL

**11 381458**  
**RECIFE MODERNISES ITS TROLLEYBUS SYSTEM**

An account is given of the bus system in Recife, a large city in Brazil where buses account for 60% of passenger movement, taxis 15% and cars 25%, priority being given to public transport. Thirty three private companies operate 1400 motor buses and a major contribution is made by trolley buses using the country's ample supplies of hydro-electricity. The history of the trolley bus system is described and an outline is given of proposals to upgrade the system. This will provide segregated trolley bus lanes adjacent to the median strip of a three lane dual carriageway with various arrangements for pedestrian access. Indications are given of passenger capacities and the use of feeder buses is described. It is suggested that trolley buses are 1.3 times more efficient than motor buses and a description is given of a standard trolley bus developed for the system.

Scott-Hellewell, D **Surveyor** Vol. 162 No. 4763, Oct. 1983, pp 25-26, 1 Fig., 1 Phot.

**ACKNOWLEDGMENT:** TRRL (IRRD 272906)  
**ORDER FROM:** Business Press International Limited, Surrey House, 1 Throwley Way, Sutton, Surrey SM1 4QQ, England

11 381544

**PERFORMANCE TESTING OF EVS IN THE EPRI/TVA EV PROGRAM**

Performance testing has been completed on four electric vehicles: the Grumman-Olson Kubvan, SCT Electric (VW) Pickup, Jet Industries Electrica, and VW Electrotransporter Bus. The tests performed included vehicle dc energy consumption and driving range at constant speeds and on the SAE J227a C cycle, on-road driving range, hill climbing, maximum acceleration, top speed, and braking performance. Descriptions of the vehicles tested and comparisons of major performance parameters on all four vehicles are presented. This testing was performed at the TVA Electric Vehicle Test Facility.

Driggans, RL

Tennessee Valley Authority TVA/OP/EDT-83/20, 1983, 12p

ORDER FROM: NTIS DE83902498

11 381584

**VEHICLE CATALOG: DEVELOPED FOR THE FISCAL YEAR 1983 UMTA (URBAN MASS TRANSPORTATION) SECTION 16 (B) (2) PROGRAM**

This publication contains information which can be used by applicants for an UMTA Section 16(b) (2) Capital Assistance Grant to help in the selection of the vehicles and ancillary equipment needed for the agency's transportation program. The catalog includes guidance for the selection of the proper vehicle; a discussion on preventative maintenance; detailed information, with illustrations and example floor plans, for the types and sizes of vehicles available in the Ohio program; and a listing, with discussions, of all ancillary equipment available to be added to the selected vehicle.

Meacham, DG Wood, WD James, HS

Ohio Department of Transportation, Urban Mass Transportation Administration Annual Rpt ODOT-BPT-008, Apr. 1983, 244p  
Contract DOT-UMTA-OH-09-8008

ORDER FROM: NTIS PB83-256883

11 381886

**RECENT ACTIVITIES OF THE APTA BUS TECHNOLOGY LIAISON BOARD**

The American Public Transit Association (APTA) supports the Bus Technology Liaison Board (BTLB) under contract to the Urban Mass Transportation Administration (UMTA) of the U.S. Department of Transportation. The function of the Board is to provide the transit industry's viewpoint and advice in the form of reviews and evaluations of UMTA's bus and paratransit technology projects. Recent activities of the BTLB related to product improvements, regulations, and procurement policies in the urban transit bus industry are examined.

West Coast International Meeting Vancouver, British Columbia, August 8-11, 1983.

Cihak, FJ Jones, PD (American Public Transit Association) SAE  
Technical Paper Series SAE 831187, HS-035 946, 1983, 3p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration

ORDER FROM: Society of Automotive Engineers, Incorporated, 400 Commonwealth Drive, Warrendale, Pennsylvania, 15096

11 381910

**EXTENDING ENGINE LIFE AND REDUCING MAINTENANCE THROUGH THE USE OF A MOBILE OIL REFINER**

The by-pass oil refiner, which removes both solid and liquid contaminants, has shown itself to be very effective in substantially extending the life of an engine. In twelve years of piloting and testing with school bus fleets, this author found the refiner to keep oil cleaner than either a full-flow or diesel by-pass oil filter can and, in doing so, eliminate the necessity of interval oil changes. Its use constitutes a major maintenance change: extended oil use results in a processing of oil and engine which can be accomplished in no other way. The purpose of this paper is to present an overview of twelve years of field observation and experience with the by-pass oil refiner. The concept presented demonstrates the ability of the refiner to deliver improved engine life with reduced levels of maintenance.

International Off-Highway Meeting and Exposition Milwaukee, Wisconsin, September 12-15, 1983.

York, ME (York Refiner Division) SAE Technical Paper Series SAE 831317, HS-036 054, 1983, 9p, 19 Fig.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration

ORDER FROM: Society of Automotive Engineers, Incorporated, 400 Commonwealth Drive, Warrendale, Pennsylvania, 15096

11 382230

**AUTOMATED PASSENGER COUNTING SYSTEMS. SYNOPSIS OF WORKING GROUP MEETING**

The mechanics of automated passenger counting on transit buses and the accuracy of these systems are discussed. Count data needs to be time coded and distance/location information is necessary for effectively correlating data to specific bus stops or other key locations. To check accuracy of automated data, results were compared with that from the typical on-board ride-checker. Ride checkers performed generally better than APC's. It was shown that ride checkers are more accurate on boardings than alightings; that standee loads obstruct checkers from recording departures through the center door. Checkers' accuracy also varies from day to day, and between individuals. APC's do not suffer from human variability. There are mechanical problems, with the automatic devices, particularly the sensor equipment.

Transportation Systems Center March 23-25, 1982.

Poirier, PJ Hobbs, VJ

Transportation Systems Center, Urban Mass Transportation Administration DOT-TSC-UMTA-83-23, May 1983, 45p, 4 Fig., 10 Tab., 1 App.

ORDER FROM: UMTA

11 382231

**AIR STARTERS FOR TRANSIT BUSES**

This study was conducted to familiarize transit agencies with the potential benefits gained by utilizing air starting systems as an alternative to electrical starting systems. The potential benefits include improved starting reliability under hot and cold weather conditions and cost savings in electrical system maintenance.

Yu, C McCurdy, N

Transportation Systems Center, Erdoel and Kohle[Erdgas][Petrochemie] DOT-TSC-UMTA-83-21, May 1983, 10p, 2 Fig.

ORDER FROM: UMTA

11 382266

**ELECTRIC VEHICLES: LESSONS AND THE LEGACY**

Some topics discussed are the following: the collapse of the electric vehicle industry; the controversy over the demonstration program; the accomplishment of the basic mission of the program; government intervention; operating data sought by fleet users; continued international interest; and continued research on batteries.

Greenberg, G (Electric Vehicle/Battery Technology) Energy Vol. 8 No. 4, 1983, pp 6-8

ACKNOWLEDGMENT: EI

ORDER FROM: ESL

11 382267

**COLD WEATHER TRANSIT TECHNOLOGY PROGRAM. VOLUME 8: BUS WHEEL HOUSING DEICING PROJECT**

The Cold Weather Transit Technology (CWTT) Program was initiated to develop new and effective methods for assuring the dependable operation of transit systems in severe cold, ice, and snow. The CWTT program is being implemented by UMTA through a grant to the University of Notre Dame with the Vought Corporation as the principal contractor. Bus operations in the winter tend to collect ice and slush within the bus wheel housings due to wheel splash. This buildup of ice eventually contacts the steering wheels and linkages, thereby limiting or preventing safe operation of the bus. The objective of this task was to evaluate the effectiveness of a wheel housing deicer on an existing bus transit system. This report presents the design and development of a bus wheel housing deicer system and its evaluation during the winters of 1981-1982 and 1982-1983. This task was conducted in 3 phases: 1) a survey was conducted of bus systems to quantify the wheel housing icing problems and to identify a particular bus model and property



location for the performance of the deicer evaluation; 2) an analysis was made of various devices to determine the most applicable wheel housing deicing method for evaluation; and 3) operational evaluation involved designing, fabricating, and installing a deicer system in the steered wheel housing areas of an existing bus and comparing its operation with an unmodified bus operating in same winter environment.

Payne, JN Lawson, SJ, Jr Barrilleaux, HP  
Vought Corporation, Urban Mass Transportation Administration Final Rpt. UMTA-IN-06-0009-83-8, Nov. 1983, 51p

ORDER FROM: NTIS PB84-137462

**11 382281**

**LISTING OF NEW BUS TECHNOLOGY APPLICATIONS**

The New Bus Equipment Introduction program is designed to demonstrate innovative features on transit buses and encourage the adoption of innovative features that enhance productivity. New bus demonstrations and purchases have been catalogued for the last four years based on news releases in transit journals and discussions with UMTA capital grants personnel. The more innovative purchases and demonstrations are listed at the conclusion of this report. Criteria used for listing equipment purchases and demonstrations are: articulated bus, new manufacturer, unusual body style, and unusual power source. Some innovative features now entering the American bus market are: 6 cylinder turbo-charged engines (Blue Bird and Grumman); articulated small buses (Chance); gas turbine engines (GMC); air cooled engines (IVECO); double-deck bodies (Neoplan); climate-specific equipment (Orion); and dual-powered buses (Renault). This report presents the findings of research on bus purchases and demonstrations by transit systems in the U.S. involving innovative vehicles or equipment. Purchases and demonstrations have been catalogued for the last four years. The purchases included in this report show innovative equipment and new manufacturers in the American market. The trend toward mass bus purchases through consortia and a heightened interest in vehicles built by non-traditional manufacturers are shown. The report demonstrated that there is strong interest among transit systems for vehicles that can meet the requirements imposed by local conditions.

Glasser, HS  
SAFE Journal, Urban Mass Transportation Administration,  
(TSC/DTS-64) Final Rpt. UMTA-MA-06-0126-83-4, DOT-TSC-UMTA-83-29, Dec. 1983, 36p Contract DTRS557-81-C-00053  
ORDER FROM: NTIS PB84-149988

**11 382318**

**THE ELECTRIFYING FUTURE OF TRANSIT**

The resurgence of the trolley bus throughout the world is discussed. While in recent years 13 trolley bus systems were scrapped, 23 others were created or substantially expanded. The long-term prospects for liquid fuels were one factor. The article also discusses finance, operating and maintenance costs, performance, service life, and reduced power requirements through changes in electrical power conditioning equipment. As an alternative to complete trolley installations, there is interest in vehicles capable of operation off the trolley by use of batteries or a diesel engine. In a separate article, the present status of battery buses is discussed. The limit of power storage capacity in current batteries precludes the use of such electric buses on regular transit routes. Some buses are recharged with a diesel engine, or by differing methods of transferring electric energy to the vehicle.

Goldsack, PJ *Mass Transit* Vol. 11 No. 2, Feb. 1984, 5p, 1 Phot.

ORDER FROM: Mass Transit, 337 National Press Building, Washington, D.C., 20045

**11 382322**

**METHANOL AS AN ALTERNATE FUEL—DETROIT DIESEL ALLISON REVEALS RECENT RESEARCH**

California has been testing methanol as a fuel for automobile engines and, more recently, for buses. Golden Gate Transit is operating two buses on the fuel, one with a spark-ignition engine and the other having the first compression ignition (diesel) engine to be methanol fueled. Detroit Diesel Allison has developed its DDEC electronic control for the two-cycle 6V-92TA engine which operates as a pure diesel except for glow-plug starting. The cooling effect of methyl alcohol vaporization means the engine blower must be bypassed when burning methanol. Metering and mixing of fresh air and exhaust gases is achieved by an electrical/pneumatic control which

senses engine, accessory and vehicle operating modes. To burn methanol in any Detroit Diesel engine, it is reported only necessary to readjust electronic engine calibration, properly control blower bypass and change injector tips.

*Bus Ride* Vol. 19 No. 8, Jan. 1984, pp 60-62, 2 Phot.

ORDER FROM: Friendship Publications, Incorporated, West 2627 Providence, P.O. Box 1472, Spokane, Washington, 99210

**11 382583**

**BUS GUIDANCE TECHNOLOGY: A REVIEW OF CURRENT DEVELOPMENT**

This report provides a review of on-going developments in bus guidance technology. It describes in detail the design, testing and implementation of guided bus systems in West Germany and Sweden, as well as developments that are beginning to take place in Australia and Great Britain. The report also summarizes North American interest in the concept to date. Two primary types of bus guidance technology are discussed—mechanical and electronic. Based on experience in Europe, the study concludes that both are technologically feasible, although electronic guidance has not yet proven itself as acceptable to drivers and passengers and faces substantial attitudinal and institutional barriers. Nevertheless, there are applications that suggest that the use of one or the other. Because of its advantages over light rail or bus operation, guided bus is likely to become an important mode in the future. The continuing developments in Europe and Australia, as well as in Seattle, will provide valuable data for evaluating the future applicability of the concept.

Ruprecht, LS Englisher, LS  
Multisystems, Incorporated, Urban Mass Transportation Administration Final Rpt. UMTA-IT-06-0247-84-1, Dec. 1983  
Contract DTUM-60-81-C-71073  
ORDER FROM: NTIS PB84-170497

**11 382588**

**EUROPEAN BUS BUILDERS SET SIGHTS ON NEW PEAKS AHEAD**

While European bus makers are increasingly becoming involved in the U.S. market, they are looking to the developing nations for real growth. As Third World countries develop bus body building capacity, Europe's manufacturers will team with them to supply chassis and engines. Kit form shipments are already a substantial part of the bus export business. The article concludes with an extensive summary of European builders and describes their penetration of the bus export market.

Goldsack, PJ *Mass Transit* Vol. 10 No. 12, Dec. 1983, 7p, 1 Phot.

ORDER FROM: Mass Transit, 337 National Press Building, Washington, D.C., 20045

**11 382589**

**JOINT VENTURES—MULTINATIONAL COMPANIES CHANGING SHAPE OF U.S. BUS BUSINESS**

The "Buy America" provisions of funding legislation have seen Canadian and European builders teaming with U.S. firms to supply buses to U.S. transit systems. While formerly two U.S. builders dominated their domestic market, recent years have seen these changes: (1) Multinational corporations have established substantial bus manufacturing capacity in the U.S. and are increasing their market share, possibly as a preliminary to becoming major suppliers of trucks; (2) The U.S. market has become stagnant and represents mainly replacements, rather than expansion; (3) U.S. manufacturers had relied on high-volume sales of standard vehicles and may have to resort to international manufacturing to offset high labor costs; (4) Smaller U.S. facilities of non-U.S. firms tend to serve specialized and regional markets. Pessimists in the industry are concerned that U.S. capacity for producing buses has increased 25% without any prospect of more sales. A summary of the status of the U.S. and joint-venture producers follows.

Young, D *Mass Transit* Vol. 10 No. 12, Dec. 1983, pp 12-15

ORDER FROM: Mass Transit, 337 National Press Building, Washington, D.C., 20045

11 382603

**STUDY ON A DRIVE WITH SYNCHRONOUS ENGINE FOR ELECTRIC POWERED VEHICLES**

An a.-c. driving unit destined for use in an electric powered vehicle is studied consisting of a synchronous engine, a converter with load independent current in the indirect circuit and a battery. Three specially developed simulation programs are used to analyse the driving unit with special regard to operational behaviour, utilization, overload capacity and power loss. The first part deals with the utilization possibilities of the synchronous drive in a vehicle based on the capacity demands of road traffic. In the second part a control method is developed which makes it possible to operate the actuator and the inverter synchronously in an adequate way. In the third part a control method for the speed range above the type point is developed and investigated for quasi-stationary operation. Given an interconnected d.c.-chopper converter with indirect circuit control this method uses the inverted rectifier for control. [German]

U.S. Sales only. Portions are illegible in microfiche products.

Fuchs, W

Technical University of Aachen, West Germany Thesis NP-3770408, June 1981, 184p

ORDER FROM: NTIS DE83770408

11 382723

**STATIC ANALYSIS OF COMMERCIAL VEHICLE FRAMES: A HYBRID-FINITE ELEMENT AND ANALYTICAL-METHOD**

Vertical as well as horizontal and torsional static and dynamic loads act on chassis frames. The torsional behaviour of most commercial vehicle frames is dominated by warping torsions, because warping is inhibited in the joints where the cross-members are attached to the side-members. This paper presents a hybrid method of analysis, which combines finite element idealization of the joint areas with analytically derived beam elements for the cross-member and side-member sections. The beam element includes warping torsion force displacement relationships. The flexibility of the joints is included together with the compatibility of their displacements. The method gives close agreement with experimental results. (Author/TRRL)

Beerman, HJ (Technical University Of Braunschweig, W Germany) *International Journal of Vehicle Design* Vol. 5 No. 1-2, Jan. 1984, pp 26-52, 23 Fig., 1 Tab., 20 Refs.

ACKNOWLEDGMENT: TRRL (IRRD 273772)

ORDER FROM: ESL

11 382725

**THE DESIGN OF BUS AND TRUCK STRUCTURES FOR PASSENGER AND CREW SAFETY**

The current legal situation in Europe is reviewed, with a description of the work leading up to the proposed ECE regulation on the strength of the superstructure of buses. Emphasis is given to the fact that this will be the first regulation of its kind that can be met by a calculation method. Correlation of full scale test, component tests and theory is demonstrated. A discussion of computer programs available to calculate the collapse properties of truck and bus structures is followed by examples of the proven accuracy of the CRASHD finite element program. The examples include buses, truck cabs and agricultural tractor cabs. Finally, examples of accident simulation are reported where both the motion of the vehicle and the structural deformation are included. (Author/TRRL)

Tidbury, GH (Cranfield Institute of Technology) *International Journal of Vehicle Design* Vol. 5 No. 1-2, Jan. 1984, pp 67-85, 20 Fig., 9 Phot., 23 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273774)

ORDER FROM: ESL

11 382728

**A LINEAR STUDY OF THE TRANSIENT AND STEADY TURNING BEHAVIOUR OF ARTICULATED BUSES**

A linear mathematical model has been developed for studying the directional responses to step steering input of two types of articulated buses. The following concepts are discussed: Vehicle A with rear engine and non-steered trailing axle powered and Vehicle B with rear engine, steered trailing axle and middle axle powered. The articulated bus is treated as a linear dynamic system with three degrees of freedom. Directional

responses of the yaw rates of the two vehicle units, the sideslip angle of the front section and the articulation angle between the front and rear sections to step steer angle inputs have to be determined in order to evaluate the manoeuvrability of the vehicle system. Results of the series of sample calculations are presented with the objective of indicating the manner in which directional response characteristics are influenced by various vehicle design parameters, such as loading condition, position of centre of mass, location of turntable centre, mass and yaw moment of inertia of vehicle units, and tyre cornering stiffness, the calculations also show that the directional dynamics of this type of vehicle are substantially affected by the vehicle velocity and damping between the sections of the articulated bus. (Author/TRRL)

Vlk, F (Technical University Of Brno, Czechoslovakia) *International Journal of Vehicle Design* Vol. 5 No. 1-2, Jan. 1984, pp 171-196, 29 Fig., 12 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273777)

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11 382731

**DESIGN ANALYSIS FOR HEAVY DUTY VEHICLES-TODAY AND TOMORROW**

The paper discusses methods used by one heavy-duty vehicle manufacturer in the use of design analysis in product development processes. Special characteristics of heavy-duty vehicles are examined including sections on design analysis technology, loads and criteria, and project management. The discussion on design analysis technology covers the two main areas of stress analysis and dynamic analysis, and details ways in which such techniques are used to develop designs for truck and bus structures and also their analysis using finite element techniques combined with computer graphics modelling systems. It is concluded that design analysis technology will in the future provide more accurate analytical representations of heavy-duty vehicles and, with the implementation of computer-aided engineering (cae), will aid the development of high-quality products at low costs. (Author/TRRL)

Harris, MN Nawrocki, PE (General Motors Corporation) *International Journal of Vehicle Design* Vol. 5 No. 1-2, Jan. 1984, pp 104-114, 3 Fig., 12 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272780)

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11 382732

**A DESIGN PROCEDURE FOR THE OPTIMIZATION OF VEHICLE SUSPENSIONS**

The optimal design of passive suspensions in a nonlinear programming formulation is considered, based upon statistical analysis of vehicle vibrations and dynamic loads. The method of monotonicity analysis is employed in the optimization study which results in a special-purpose design algorithm. The simplicity of the computations allows fast and inexpensive post-optimal parametric study and development of design charts that give the optimal quantities for any given inputs. (Author/TRRL)

Xiao-pei, P Heng-lung PE Papalambros, P (Michigan University, Ann Arbor) *International Journal of Vehicle Design* Vol. 5 No. 1-2, Jan. 1984, pp 129-142, 7 Fig., 1 Tab., 14 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273781)

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11 382764

**OPERATIONAL DEMONSTRATION OF DUAL-MODE-BUSES IN THE CITY OF ESSEN**

In the city centre of Essen buses have to operate with a lot of hindrances caused by traffic congestions etc. The aim of a research project funded by the German minister of research and technology is to use existing tunnels for streetcars in Essen for dual-mode-buses (Spurbusse). Since 1979 the Essener Verkehrs-AG is working together with the related industry and consulting companies on planning and realisation of this project in different steps. The first phase is a track for guided buses of 1.3 km length (Fulerumer Strasse) where 25 guided buses are in daily operation since September 1980. The second phase is a combined track for guided buses with dual propulsion (electrical on mains and a diesel engine) and streetcars of 900 M length (Wittenbergstrasse). Operation with the guided diesel

buses and two dual-mode prototypes will start in 1983. On this surface-level track the conditions of the future tunnel operation are simulated, especially relating the track, the overhead lines, and the combined operation. The third phase will be the combined dual-mode bus/streetcar operation in the existing tunnel (starting probably 1985/86). There are some components of the dual-mode bus system, for which special planning, research, development and testing has to be done in the Essen project:- mechanical guidance for buses;- safety system for combined streetcar/guided bus-operation;- combined public transport way for streetcar and guided bus;- overhead network;- dual propulsion prototype buses;- combined streetcar/guided bus-switch. If this research project succeeds, the mass transit of Essen will have an attractive bus system, which- can operate with diesel engine in the outskirts;- can operate as a trolleybus with very good environmental conditions;- can use separated tracks with automatic guidance equipment;- can use the same tracks with the rail system, even in tunnels;- can provide good transfer conditions with the light-rail system. (Author/TRRL)

Public Transport Planning and Operation. Proceedings of Seminar L held at the PTRC 11th Summer Annual Meeting.

Boegner, J (Essener Verkehrs-Ag) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1983**, pp 197-202

ACKNOWLEDGMENT: TRRL (IRRD 273509)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**11 382780**  
**ENERGETIC OPTIMIZATION OF PROPULSION SYSTEMS FOR ELECTRIC VEHICLES [ENERGETISCHE OPTIMALISERING VAN AANDRIJFSYSTEMEN VOOR ELEKTRISCHE VOERTUIGEN]**

Various studies showed that a separately-excited DC motor provides the best combination of efficiency, performance, production cost and system reliability for a near-term electric vehicle. The research described in this thesis concerns investigations into propulsion systems suitable for electric vehicles. Preliminary investigations into the energetical aspects of electric vehicles have proved that- particularly in the case of regenerative braking- the characteristics of the propulsion system strongly influence the energy consumption. Starting from the separately-excited DC motor various drive trains are described. Simulation results for different drive trains are discussed. The main conclusions drawn from these studies can be summarized as follows: (1) from an energetical point of view a propulsion train using a variable gear ratio in general has to be preferred to a drive system with a fixed gear ratio; (2) the high operational comfort of the power train with the modified automatic gearbox is paid for with a relatively high energy consumption in comparison with the drive train using a manual gearbox; (3) the operating range appears to depend on both peak power requirement and average energy used per kilometre; so power train matching with respect to the peak power demand is strongly recommended; (4) this simulation program allows an accurate comparison of vehicle drive trains, while component deficiencies are clearly demonstrated. (Author/TRRL) [Dutch]

Dissertatiedrukkerij Wibro Thesis 1983, n.p., Figs., Tabs., Photos., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 273440), Institute for Road Safety Research SWOV  
ORDER FROM: Dissertatiedrukkerij Wibro, Zeenaaidplantsoen 2, Helmond, Netherlands

**11 384598**  
**THE RIJKURVE SIMULATION MODEL [HET SIMULATIEMODEL RIJKURVE]**

Description of a computer model which calculates and draws up the path which is covered in a certain manoeuvre by any given vehicle at any speed. Using this model one can calculate not only the appropriate size of bus-stops etc, but also whether buses and other large vehicles will be able to negotiate roads and curves. In addition, which is important in (re) designing residential areas: It is possible to estimate the optimal size and shape of speed-reducing elements. (TRRL) [Dutch]

Verkeerskunde Vol. 34 No. 11, Nov. 1983, pp 544-547, 7 Fig., 11 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273669), Institute for Road Safety Research SWOV  
ORDER FROM: Royal Dutch Touring Club ANWB, Wassenaarseweg 220, P.O. Box 93200, The Hague, Netherlands

**11 384627**  
**LIGHT WEIGHT AND COMPACT ELECTRIC TRACTION EQUIPMENT FOR REGIONAL TRAFFIC VEHICLES [GEWICHTS-UND RAUMSPARENDE ELEKTRISCHE ANTRIEBSAUSRUESTUNG FUER NAHVERKEHRSFAHRZEUGE]**

The Essen Transport company uses regional railway tunnels passing through the town centre for bus traffic as well. For this purpose it has developed guided bimodal buses which have both a diesel engine and electric traction equipment. [German]

Klotz, H Kratz, G **Verkehr und Technik** Vol. 36 No. 9, Sept. 1983, pp 354-357, 10 Phot., 5 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Schmidt (Erich) Verlag, Herforder Strasse 10, 4800 Bielefeld, West Germany

**11 384635**  
**DUAL-MODE-BUS IN ESSEN**

A trial and demonstration network is being developed in Essen for the operation of bimodal buses and of buses guided on their own right of way— with a view to running a mixed tram and bus system on the same tracks. Buses are diesel powered and run on their own right of way in regional traffic, and as trolley-buses on normal tracks in town centres. Mixed operation of bimodal buses running in tunnels is envisaged from 1985.

Teubner, W Boegner, J **Verkehr und Technik** Vol. 36 No. 9, Sept. 1983, pp 318-327, 11 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Schmidt (ERICH) Verlag, Herforder Strasse 10, 4800 Bielefeld, West Germany

**11 384661**  
**16(B)(2) VEHICLE PROCUREMENT STUDY**

This study was intended to determine what types of vehicle are most appropriate for various types of 16(b) (2) projects in Illinois and to develop technical specifications and other requisite bid documents to be used by the Illinois DOT in future 16(b)(2) procurements. The study included an analysis of the Division's past 16(b)(2) vehicle procurement activities, operators' experiences with the vehicles purchased under previous grants and the vehicle specifications used. Bid documents and vehicle specifications developed under this study are available under separate cover as appendices.

Ketola, HN Varker, FA Balog, JN  
Ketron, Incorporated, Illinois Department of Transportation, Urban Mass Transportation Administration Final Rpt. PT83034, Oct. 1983, v.p., Figs., Tabs., 2 Ref., 3 App. Contract IL-09-8005  
ORDER FROM: Ketron, Incorporated, One Broadway, Cambridge, Massachusetts, 02142

**11 384903**  
**AIR CONDITIONING MODIFICATIONS TO AMG BUSES**

This report presents the documentation and evaluation of air conditioning system modifications devised by Miami (Florida) Metrobus and Los Angeles SCRTD for the AM General Model B bus. The objective of these modifications was to reduce the frequency of bus air conditioning and related system failures. Major modifications included both relocation of, and replacement and relocation of, the A/C condenser, installation of new condenser fans and an additional alternator, and replacement of certain other air conditioning system components. The documentation of the air conditioning modifications discusses the extent of air conditioning related problems encountered in the operation of AMG buses and lists the agencies' goals and objectives in devising solutions to these problems. Narrative descriptions along with photographs, parts lists, procedures and costs for the modifications are given, with sufficient detail to permit other transit authorities having similar problems to implement these changes to their coaches should they desire to do so. The evaluation of the air conditioning modifications focuses primarily on system reliability. Data for the evaluation was extracted from existing maintenance and other records

at Metrobus and SCRTD. These included road call reports, daily service reports, and bus repair history records.

Delpidio, DJ Perez, D  
Transportation Systems Center, Urban Mass Transportation  
Administration, (TSC/DTS-63) Final Rpt. UMTA-MA-06-0120-83-4,  
DOT-TSC-UMTA-83-55, Dec. 1983, 82p

ORDER FROM: NTIS PB84-164292

#### 11 385272 VEHICLES AND PROPULSION SYSTEMS

This chapter attempts to answer the question "should a trolley bus be able to operate at all away from the electrification and, if so, to what extent?" Different users, as well as manufactures, have developed different answers. Some of them are highlighted in a consideration of modern propulsion systems, of specific off-wire operations, and of procurement, maintenance and design.

This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Transportation Research Board Special Report No. 200, 1983, pp 41-44, 3 Phot.

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#### 11 385273 FREON-COOLED CHOPPERS FOR TROLLEY BUS APPLICATIONS

This paper describes the characteristics of Alstom-Atlantique's choppers: all the main components of the choppers are placed inside a freon-filled container. The liquid cooling system efficiently protects those components against aggressive external elements while maintaining the semiconductors at a more constant average temperature.

This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Soffer, J Transportation Research Board Special Report No. 200, 1983, pp 44-46, 2 Fig.

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#### 11 385274 A LOOK AT CHOPPER SYSTEMS

This paper reviews the 2-phase armature chopper, which is used on the trolley fleets in Seattle and Philadelphia.

This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Swartz, G Transportation Research Board Special Report No. 200, 1983, pp 47-48

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#### 11 385275 ADVANCED TECHNOLOGY FOR TROLLEY BUS SYSTEMS

This paper reviews Westinghouse's research in trolley bus technology: chopper propulsion, microprocessor developments, automatic requiring, a.c. drive propulsion, off-wire propulsion and maintenance.

This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored in UMTA.

Matty, TC Transportation Research Board Special Report No. 200, 1983, pp 48-50, 3 Fig.

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#### 11 385276 OFF-WIRE OPERATION

Off-wire propulsion can fill several needs, including the short-term need to avoid delays when stuck on an insulator, or to get around a defective switch or broken wire. It can be achieved with batteries, reciprocating engines, and with flywheels.

This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Parkinson, TE Transportation Research Board Special Report No. 200, 1983, pp 50-51

ORDER FROM: TRB Publications Off

#### 11 385277 MODERN TROLLEY BUS OVERHEAD CONTACT LINES

Kummler and Matter, in Switzerland, have developed a fully elastic overhead contact line that meets the requirements of rapid transit for electric vehicles and eliminates the disadvantages of the old, rigid suspension system.

This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Steffani, G de (Kummler and Matter, Switzerland) Transportation Research Board Special Report No. 200, 1983, pp 53-54, 2 Fig.

ORDER FROM: TRB Publications Off

#### 11 385278 SUPERVISORY CONTROL SYSTEMS

In this paper, SEPTA'S experience with the one-on-one SCADA system is reviewed. To date this experience has been positive. SEPTA will shortly put into operation a dual-redundant computer-based single-master type system. This new system will handle not only substation control, but will also have the capability for single system supervision and fixed facility supervision.

This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Margo, TE Transportation Research Board Special Report No. 200, 1983, pp 54-56, 3 Fig.

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#### 11 385279 REBUILDING SEATTLE'S TROLLEY OVERHEAD SYSTEM

Some of the lessons learned and experiences in the rebuilding and the expansion of the Seattle trolley system are described.

This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Maxin, S Transportation Research Board Special Report No. 200, 1983, pp 56-58

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#### 11 385280 WHAT THE FUTURE HOLDS

In those cities that have trolley buses, public perception and support are favorable for improving and expending the system. Trolley buses are not a panacea to urban transit ills, but there are applications that appear economically and operationally attractive. Economic, environmental, operational, and technological considerations must be examined for each application.

This paper appeared in TRB Special Report 200, the Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

# Bus & Paratransit Vehicle Technology

11

Transportation Research Board Special Report No. 200, 1983, pp 59-60

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12 380160

**EVALUATION OF A BUS PREEMPTION STRATEGY BY USE OF COMPUTER SIMULATION**

The effects of implementing a bus preemption strategy on an arterial corridor (Monument Avenue) in Richmond, Virginia, were studied. The Urban Traffic Control System/Bus priority System microscopic traffic simulation model was used to simulate the bus preemption system operation for various bus flow rates and bus stop locations. A benefit-cost analysis found bus preemption to be unjustified for the network. A comparison of benefit-cost ratios for the individual intersections showed a parabolic shape in the corridor. The benefits of bus preemption were found to be limited by the preemption algorithm structure and the bus stop location. A far-side bus stop was found to minimize the negative effects of bus preemption on automobile travel delay. The results were related to the control algorithm studied, and it was recommended that a more sophisticated control algorithm be developed for simulation studies and that similar studies be performed for other control algorithms.

This paper appeared in Transportation Research Record No. 906, Urban Traffic Systems.

Benevelli, DA (JHK and Associates); Radwan, AE (Virginia Polytechnic Institute & State University); Hurley, JW, Jr (Memphis State University) *Transportation Research Record* No. 906, 1983, pp 60-67, 8 Fig., 13 Ref.

ORDER FROM: TRB Publications Off DOTL JC

12 380898

**BUS CONTROL: A REVIEW OF PRESENT KNOWLEDGE**

This paper attempts to review present knowledge of bus control gained from past practical experiences of its operation, and quantitative studies of particular cases. Details are given of the three types of control system available to bus operators: roadside inspector systems, centralised systems relying primarily on the use of radio-telephones, and centralised systems relying on the use of radio-telephones in conjunction with some form of automatic vehicle monitoring. The main purpose of control is to minimise total passenger waiting time. The methods used to achieve this will differ for low and high frequency routes. There are two distinct means by which a controller can achieve his objectives: manipulatory and supervisory control. Before and after surveys used on actual bus routes and simulation studies are used to estimate the benefits derived from improved control. Social and financial criteria are utilised to assess whether expenditure is justified on high frequency routes. No quantitative assessments have been carried out within the British Isles of the value of control on low frequency routes. For the covering abstract of the seminar see IRRD 271562. (TRRL)

Proceedings of the Ninth Annual Seminar on Public Transport Operations Research, July 6-8, 1977.

Finnamore, AJ Jackson, RL (Transport and Road Research Laboratory) Leeds University, England, *TUDIES* July 1977, pp 41-52, 4 Tab., 10 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 271563)

ORDER FROM: Leeds University, England, Operational Research Unit, Centre for Computer Studies, Leeds LS2 9JT, West Yorkshire, England

12 381418

**QUEENS VILLAGE: A QUANTUM JUMP IN BUS CONTROL/COMMUNICATIONS (NEW YORK CITY)**

Implemented in April 1979, the Radio-Data-Locator System automatically monitors each bus in the Queens Village Depot fleet (New York City Transit Authority). Two-way radio frequency channels, each operating on a pair of 470 MHz frequencies, link a solid-state voice radio and piggyback data package onboard the bus to transmitters strategically located on signposts along the 12 local and express routes. The signposts, from which a location code number is continually transmitted at low power on a VHF frequency, are linked to the East New York Bus Command Center computer via the radio. As the radio transmits, vehicle identity (four-digit bus serial number representing route and run number) and location are automatically displayed (video display terminal) for the Command Center dispatcher. Through its program and memory and an elapsed time generator in the bus data package, the computer uses an average speed to update the real-time bus location between signposts. Polling any of the 230 fleet buses every 90 sec., the computer monitors route, schedule adherence,

and mechanical sensor alarms. Buses can be called selectively, in groups, or on an all-call basis, for voice communications. The computer also promptly develops hardcopy reports (e.g. on major headway and schedule deviations). With the Radio-Data-Locator System, there has been a marked reduction in passenger complaints.

Conference held in Dearborn, Michigan, 15-17 September 1980. Also published in HS-030 396 (IEEE-80CH1601-4; SAE-SP-90), "Convergence 80. IEEE Vehicular Technology Society Annual Conference (30th), International Conference on Transportation Electronics Proceedings," Utica, Michigan, 1980.

Dornfeld, S (New York City Transit Authority) Institute of Electrical & Electronics Engrs, Inc, Society of Automotive Engineers, Incorporated IEEE-80CH1601-4, HS-030 442, 1980, 7p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration

ORDER FROM: Institute of Electrical & Electronics Engrs, Inc, Service Center, 445 Hoes Lane, Piscataway, New Jersey, 08854

12 381419

**TORONTO TRANSIT COMMISSION COMMUNICATIONS AND INFORMATION SYSTEM. EVALUATION OF OPERATIONAL TESTS**

Components and pilot testing of the Toronto Transit Commission's (TTC) bus communications/monitoring/control system are described. Developed in conjunction with the Ontario Ministry of Transportation and Communications, the Communications and Information System (CIS) provides for emergency assistance, route supervision, schedule development, performance reporting, passenger information, and traffic signal prioritization. The CIS equipment used currently and in testing consists of a two-way voice and digital radio, mobile terminal, and vehicle location and passenger counting devices; two control consoles and associated displays and computers at the Wilson Division Control Centre; and a passenger information display at the Wilson Subway Station. Operational tests were conducted in Oct-Dec 1979 on the Wilson Division's 100 bus fleet operating on six TTC routes. Capabilities were measured using before-and-after surveys and interviews with controllers, inspectors, and operators. A 3% to 5% improvement in service efficiency was found and the system was considered cost/effective. The CIS is now being expanded to the TTC's total surface fleet of 1600 vehicles, including buses, trolleys, and streetcars.

Conference held in Dearborn, Michigan, 15-17 September 1980. Also published in HS-030 396 (IEEE-80CH1601-4; SAE-SP-90), "Convergence 80. IEEE Vehicular Technology Society Annual Conference (30th), International Conference on Transportation Electronics Proceedings," Utica, Michigan, 1980.

Catton, FD Berney, LG (Toronto Transit Commission) Institute of Electrical & Electronics Engrs, Inc, Society of Automotive Engineers, Incorporated IEEE-80CH1601-4, HS-030 443, 1980, 5p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration

ORDER FROM: Institute of Electrical & Electronics Engrs, Inc, Service Center, 445 Hoes Lane, Piscataway, New Jersey, 08854

12 381420

**LOW-COST AVM (AUTOMATIC VEHICLE MONITORING) THROUGH MULTI-USER COST SHARING**

The status of Automatic Vehicle Monitoring (AVM) in terms of locales and user types is indicated. The features of four operational Gould signpost AVM systems are summarized: Southern California Rapid Transit District bus transit/paratransit Department of Transportation sponsored); Huntington Beach Police; Quebec-Cartier Mine (open-cut); and Detroit, solid waste haulage. The economy of multi-user sharing of AVM system elements is discussed. Cost savings in each of the three subsystem areas (location, communications, and data processing) are examined. The most promising candidate for multi-user AVM sharing is the location subsystem (i.e. the equipment and technology used to locate vehicles in their operating area). The "single transmission" location technique allows the communications system to be compatible with event-driven, synchronous or asynchronous polling, shared-channel, or dedicated-radio systems. Four essential elements to AVM success are listed: system simplicity, transferability throughout the U.S., ease of expandability, and cost sharing.

Conference held in Dearborn, Michigan, 15-17 September 1980. Also published in HS-030 396 (IEEE-80CH1601-4; SAE-SP-90), "Convergence 80. IEEE Vehicular Technology Society Annual Conference (30th), International Conference on Transportation Electronics Proceedings," Utica, Michigan, 1980.

Gruver, GW (Gould Information Identification Incorporated)  
Institute of Electrical & Electronics Engrs, Inc, Society of Automotive Engineers, Incorporated IEEE-80CH1601-4, HS-030 444, 1980, 4p, 5 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration  
ORDER FROM: Institute of Electrical & Electronics Engrs, Inc, Service Center, 445 Hoes Lane, Piscataway, New Jersey, 08854

**12 381421**  
**THE IMPACT OF ELECTRONICS ON THE PRODUCTIVITY OF PUBLIC TRANSIT SYSTEMS**

The electronics technology is described which was used by the General Motors Urban Transportation Laboratory (UTL) in developing the Transit Information System (TIS). The TIS is a digital data system for monitoring, controlling and providing productivity data on the operations of urban transit fleets. A two-way FM-UHF radio system, operating within the 450 MHz to 470 MHz band, is used for voice/digital communications and data gathering. The two broad areas of TIS information (real-time and off-line) are distinguished, and the use of TIS in monitoring land use changes and in an internal management process is examined. Three projects of the UTL in Cincinnati are described to illustrate the potential and pitfalls of Automatic Vehicle Monitoring (AVM) in public transit systems. Several uses of AVM/TIS technology are outlined: real-time dynamic dispatching, emergency alarm location, headway control, and calculation of transit performance indicators.

Conference held in Dearborn, Michigan, 15-17 September 1980. Also published in HS-030 396 (IEEE-80CH1601-4; SAE-SP-90), "Convergence 80. IEEE Vehicular Technology Society Annual Conference (30th), International Conference on Transportation Electronics Proceedings," Utica, Michigan, 1980.

Tyson, HB Kowalski, TW (General Motors Corporation)  
Institute of Electrical & Electronics Engrs, Inc, Society of Automotive Engineers, Incorporated IEEE-80CH1601-4, HS-030 445, 1980, 5p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration  
ORDER FROM: Institute of Electrical & Electronics Engrs, Inc, Service Center, 445 Hoes Lane, Piscataway, New Jersey, 08854

**12 381422**  
**AUTOMATIC VEHICLE MONITORING—PAST, PRESENT AND FUTURE**

Automatic Vehicle Monitoring (AVM) enables a central dispatcher to know the location and status of each vehicle and to control these vehicles to optimize fleet performance. Occupant security and vehicle and employee productivity are enhanced. Any size fleet can benefit if the costs per vehicle are suitably low. With multi-user systems, the "fixed end" costs can be amortized over a large number of vehicles. Early AVM use has primarily been in transit operations, such as the Chicago Transit Authority bus emergency location system and General Motors' transit management information system in use in Cincinnati. AVM systems are being used by the police departments of St. Louis, Dallas, and Huntington Beach (Calif.), primarily for increased patrol effectiveness and officer safety. Although AVM offers improved productivity, little data exist to support its cost/effectiveness. More data on present AVM systems are needed to allow public officials to justify expenditures for implementing such systems.

Conference held in Dearborn, Michigan, 15-17 September 1980. Also published in HS-030 396 (IEEE-80CH1601-4; SAE-SP-90), "Convergence 80. IEEE Vehicular Technology Society Annual Conference (30th), International Conference on Transportation Electronics Proceedings," Utica, Michigan, 1980.

Symes, DJ (Urban Mass Transportation Administration)  
Institute of Electrical & Electronics Engrs, Inc, Society of Automotive Engineers, Incorporated IEEE-80CH1601-4, HS-030 446, 1980, 2p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration  
ORDER FROM: Institute of Electrical & Electronics Engrs, Inc, Service Center, 445 Hoes Lane, Piscataway, New Jersey, 08854

**12 381462**  
**BUSWAYS IN RESIDENTIAL AREAS**

Disadvantages of busway such as traffic risks arising from buses entering an area free from other motor vehicles or from unauthorised traffic on the busway, noise, pollution and land claimed from other activities are discussed and means of counteracting them suggested. Some kind of barrier must be selected in order to prevent the unauthorized traffic. Permanent barriers are preferable. Further, participation of authorities and the general public in busway planning is dealt with. The advantages and disadvantages of a busway implemented in a residential area in the city of Helsingborg are presented. (TRRL)

Wallin, B Lundberg, J  
Kollektivtrafikberedningen Monograph 1983, 5p, 7 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 271651), National Swedish Road & Traffic Research Institute  
ORDER FROM: Kollektivtrafikberedningen, P.O. Box 1339, Solna, Sweden

**12 381463**  
**IMPROVED BUS TRAFFIC IN RESIDENTIAL AREAS. IMPLEMENTATION OF BUSWAYS [FOERBAETTRAD BUSSTRAFIK I BEFINTLIGA OMRAADEN]**

The aim of this report is to outline the effects of busways in residential areas. The point of view of the authorities and the possibility of financing busways are discussed. The public participation and attitudes are also dealt with. The advantages and disadvantages of a busway implemented in a residential area in the city of Helsingborg are discussed. Operating costs are studied as well as influence on journey time, safety, noise and land use. (TRRL) [Swedish]

Kollektivtrafikberedningen, (0280-123X) Monograph KTB Rapport 1983:7, 1983, 35p, Figs., 11 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 271652), National Swedish Road & Traffic Research Institute  
ORDER FROM: Kollektivtrafikberedningen, P.O. Box 1339, Solna, Sweden

**12 381464**  
**MAPS OF CAR AND BUS TRAFFIC FLOWS IN STOCKHOLM [TRAFIKFLOEDESKARTOR OEVER BIL- OCH BUSSTRAFIKEN I STOCKHOLM]**

Maps of car and bus traffic flows in Stockholm based on traffic counts are presented. The purpose is to replace these maps with new ones every five years. Maps showing the traffic flow on ramps are also available. (TRRL) [Swedish]

Lagstroem, P  
Stockholms Gatukontor, Trafikbyraan Monograph Rapport 85, 1983, 13p, 12 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 271661), National Swedish Road & Traffic Research Institute  
ORDER FROM: Stockholms Gatukontor, Trafikbyraan, Stockholm, Sweden

**12 381474**  
**BUS SELECTIVE DETECTION IN SWANSEA**

A report is presented of the bus priority scheme developed for Swansea by the West Glamorgan county council, using selective detection of buses at traffic signals. A survey of the scheme carried out by the TRRL was based on the inbound part of the system shortly after installation, which showed sections that were particularly disbeneficial to traffic other than buses. This report gives details of the modifications made to reduce these disbenefits and also details the bus time savings made on the outbound routes. The modifications have improved operations with relatively little net disbenefit with time savings being shown on both the inbound and outbound routes. The savings have enabled the bus company to re-route most of the city centre services without the penalty of additional buses or crews. (TRRL)

Collier, JC  
Department of Transport, England Monograph 1980, 20p, Figs., Tabs.

ACKNOWLEDGMENT: TRRL (IRRD 272759)  
ORDER FROM: Department of Transport, England, Traffic Advisory Unit, 2 Marsham Street, London SW1P 3EB, England

**12 382690**  
**BUS PRIORITY IN LONDON-TECHNIQUES FOR THE 1980'S**  
In the late 1970's about 150 bus lanes and other bus priority schemes were in operation in London. It was felt by many that this was close to the maximum acceptable and necessary to assist buses. Since May 1981, however, a new programme of bus priority schemes has been developed, which is expected at least to double the number of schemes in operation and to deal with many locations where previous attempts at bus priority had been unsuccessful. There are a number of factors which have assisted in developing this new programme:-(I) by far the most important technique in the new programme is that of "queue management", using the facilities of urban traffic control (utc) or other control arrangements, to relocate queues on to sections of road where bus priority is possible (or where there are no buses). This being used in sectors approaching natural barriers such as a river and along routes. (II) use is being made of a wider range of traffic management devices. (III) there is increased congestion following the collapse of the "cheap" fares policy. (IV) bus lanes are being introduced where the flow of buses is less than 35 buses/hour (the standard set in 1977), but where bus delays are considerable. (V) the pilot scheme for bus priority by selective detection in Hounslow is being extended. These factors are discussed in further detail and some specific schemes are described. (Author/TRRL)

Traffic Operation and Management. Proceedings of Seminar K held at the PTRC Summer Annual Meeting, University of Sussex, England, 4-7 July 1983.

King, GN (Greater London Council) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P240, 1983, pp 81-93, 4 Fig., 8 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 273516)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**12 382715**  
**CAPACITY AT A SIGNAL-CONTROLLED JUNCTION WHERE THERE IS PRIORITY FOR BUSES**  
A discussion of the benefits of bus priority schemes shows the importance of providing adequate capacity for all streams of traffic. The analysis of capacity at a signal-controlled road junction is extended to cases where stages may be truncated or omitted in some cycles. The problem of finding signal settings which, when implemented with priority, emulate some which are known to provide a given level of capacity when implemented without priority is considered. Two commonly used rules to give priority by selective vehicle detection are analysed in detail and a third is considered briefly to illustrate the flexibility of the methods used. The range of conditions under which these priority methods can be implemented without causing any loss of capacity is quantified. If an additional rule is implemented to prevent priority from being granted too frequently, then this range covers most practical operating conditions. In cases outside this range, consequent losses of capacity can be estimated. A numerical example based upon a real bus priority experiment is provided. (Author/TRRL)

Heydecker, BG (University College, London) **Transportation Research. Part B: Methodological** Vol. 17B No. 5, Oct. 1983, pp 341-357, 4 Fig., 4 Tab., 21 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273581)  
ORDER FROM: ESL

**12 382791**  
**BUSES LOOP THE LOOP: BUS PRIORITY SYSTEM AT TRAFFIC LIGHTS**  
Brief details are given of a system which links a loop detector with a BBC computer, giving buses priority at traffic lights. The system, developed by a team of West Yorkshire traffic engineers, is being used in a pilot scheme costing 5000 pounds. (Author/TRRL)

*New Scientist* Vol. 100 No. 1381, Oct. 1983, p 267, 1 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 273935)  
ORDER FROM: IPC Magazines Limited, King's Reach tower, Stamford Street, London SE1 9LS, England

**12 382809**  
**AURAL COMMUNICATION AND TV SURVEILLANCE SYSTEMS AT BUS TERMINALS [SISTEMI ZA GOVORNO KOMUNICIRANJE I TV OSMATRANJE U AUTOBUSKOJ STANICI]**  
This paper considers aural communication and TV surveillance systems at large bus terminals, their design and complex technological aspects. (TRRL) [Serbian]  
Zbornik, 4th Jugoslovanski Simpazij o Elektroniki v Prometu.

Jovanovic, TD Bojkovic, SZ (Saobracajni Fakultet, Beograd) *Elektrotehnska Zveza Slovenije* Oct. 1982, p D/2-1/9, 3 Fig., 2 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273830)  
ORDER FROM: Elektrotehnska Zveza Slkovenije, Titova 50, Ljubljana, Slovenia, Yugoslavia

**12 382811**  
**TRAFFIC CONTROL AT BUS TERMINAL BASED ON AUTOMATIC BUS IDENTIFICATION [UPRAVLJANJE SAOBRACAJEM U AUTOBUSKOJ STANICI PUTEM AUTOMATSKE IDENTIFIKACIJE AUTOBUSA]**  
The most significant increase in the number of passengers during the last decades happened in the bus sector. The intercity bus traffic is mostly connected with urban centres where space is limited and traffic demands cannot be met adequately. When designing bus terminals attention must be paid to the adequate control of the bus terminal system consisting of buses, passengers, crews and other subsystems in order to achieve a given capacity and level of service. In this paper a solution to bus traffic control, based on automatic bus identification, is presented. The organisation of the information control system is given together with the algorithms for the control of passenger and crew information. The basic characteristics of the electronic equipment used in this information control system are presented. (TRRL) [Serbian]  
Zbornik, 4th Jugoslovanski Simpozij o Elektroniki v Prometu.

Lazic, DM Jovanovic, TD (Saobracajni Fakultet, Beograd) *Elektrotehnska Zveza Slovenije* Oct. 1982, p D/1-1/7, 6 Fig., 4 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273829)  
ORDER FROM: Elektrotehnska Zveza Slovenije, Titova 50, Ljubljana, Slovenia, Yugoslavia

**12 382821**  
**PUTTING A STOP TO SPEEDING**  
Recent accidents have renewed public concern of coach speeds on motorways and the interest in the possible application of electronic speed limiting devices. The author suggests that high speeds are not the sole factor in the occurrence of the accidents and examines other arguments, including economy, for the use of speed limiting devices. The author describes the operating principles of three different types of speed limiter, the Econocruise, the Lucas Kienzle Top Speed Limiter and the Romatic Varispeed. These devices are capable of keeping speeds within plus or minus one mile/h making it possible to achieve a slightly faster average speed without infringing the law. All have an intermediate speed facility allowing the selection of one or more speeds lower than the pre-set tamper proof top speed control. In the Econocruise, an electronic controller picks up signals from an inductive sensor on the transmission, or from the tachograph, and as speed approaches the selected maximum a valve block intervenes in the air throttle contact. Push-pull motion is used to control the fuel injection pump as the set maximum speed is approached in the Lucas Kienzle and a solenoid valve allows pressure from a hydraulic pump to actuate a cylinder unit in the accelerator linkage in the Romatic device. (TRRL)

Townsin, A *Coaching Journal and Bus Review* Vol. 51 No. 12, Oct. 1983, 3p, 1 Fig., 1 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 273182)  
ORDER FROM: Travel and Transport Limited, 122 Newgate Street, London EC1A 7AD, England



**12 382824**

**BUS-ACTUATED TRAFFIC SIGNALS-SIMULATION STUDY OF PRIORITY AT THREE-STAGE JUNCTIONS**

One method of giving buses priority at traffic signals is known as selective detection (SD): buses are detected in a mixed traffic stream and allowed to extend an existing green signal or to recall a green signal earlier than normal. A computer simulation model has been used to study junctions with three traffic stages or with two traffic stages and a pedestrian stage. A range of bus and other vehicle flows were simulated. Although buses could be given substantial benefits (up to 30 seconds in some circumstances), other vehicle journey times were increased, sometimes very substantially. The most suitable method of applying SD priority in a particular situation depends on the selection criterion adopted (eg minimisation of total passenger journey time). Such a criterion may well require a limitation to be placed upon the extra journey time of other traffic, which in turn may prevent the full bus benefit from being realised. Detailed results are given and tables are presented suggesting appropriate priority methods for the cases studied and associated bus benefits. It is concluded that SD priority is useful for a wide range of conditions. An analytic method for estimating bus benefits is also described and estimates are tabulated. (Author/TRRL)

Cooper, BR

Transport and Road Research Laboratory, (0305-1293) LR 1089, 1983, 50p, 11 Fig., 13 Tab., 5 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273234)

ORDER FROM: TRRL

**12 384616**

**RADIO COMMUNICATION SYSTEMS FOR PUBLIC TRANSPORT COMPANIES [RADIOKOMMUNIKATION FOER KOLLEKTIVTRAFIKENS LAENSBOLAG. UTVAERDERING AV TRE SYSTEM I DRIFT]**

The radio communication systems employed by three county bus companies have been examined and compared to provide data for other bus companies which plan to introduce such systems. There are technical and organisational differences between these three systems, due to differences in conditions, philosophies and values placed on functions. The cost of mobile units is the same, about 3000 Kroner. All systems incorporate the following functions: assistance to drivers, requests for duplicate buses, direct contact between information centre and vehicle, contact between vehicles. One system can be connected to an alarm centre and has test facilities on mobile units, while another has attack alarm, standard messages and a queue system for incoming calls. One of the systems has nobody on duty out of office hours. The systems are used, on average, twice weekly per bus. Most calls occur during rush hours. Interviews regarding operational experiences show that (1) agreement concerning service is essential, especially for the central station; (2) the system should provide facility for traffic leader to make contact immediately; (3) direct calls between buses should be possible; (4) attack alarms should be incorporated; (5) staff should be given repeated training in the use of the system. (TRRL) [Swedish]

Kollektivtrafikberedningen KTB Rapport 1983:13, 1983, 32p, 3 Fig., 3 Tab., Apps.

ACKNOWLEDGMENT: TRRL (IRRD 274410), National Swedish Road & Traffic Research Institute

ORDER FROM: Kollektivtrafikberedningen, P.O. Box 1339, Solna, Sweden

**13 380127**  
**TRACTION MOTOR FAILURES PROMPT TASK FORCE STUDY**

After Chicago Transit Authority experienced crippling traction motor failures on its rapid transit cars during a heavy 1979 snow, it sparked organization of an APTA task force to recommend solutions for the problem which was found to be endemic on North American transit. The high failure rate seems to be due primarily to the demand for exceptional performance from small, lightweight motors. Lack of forced ventilation is often involved. Coupled with the rugged duty cycle is widespread use of dynamic braking which imposes high voltages on motors. Placing transit trackage along urban expressways exposes motors to ingestion of road salt. A series of severe winters, aging car fleets, reduced maintenance programs, and retirement of skilled maintainers have contributed. Motor manufacturers would also like operating properties to limit the number of dead cars in a train; specify how acceleration, dynamic braking and coasting are to be used; restrict switching by single cars; and anticipate future changes that could affect car duty cycles. Three topics are being studied by separate subcommittees: Specification for new motors, maintenance, and standards for rebuilding existing motors.

Young, D (Chicago Tribune) *Mass Transit* Vol. 10 No. 11, Nov. 1983, 5p, 3 Phot.

ORDER FROM: Mass Transit, 337 National Press Building, Washington, D.C., 20045

**13 380190**  
**TECHNICAL AND ECONOMIC ANALYSIS OF A RAPID-TRANSIT BATTERY-STORAGE SUBSTATION PROJECT. FINAL REPORT**

This final report evaluates the technical and economic viability of deploying battery storage in New York City subway traction substations. Rapid transit systems, which experience daily peak periods of travel, accommodate the demands by operating numerous multicar trains at closely spaced intervals. This activity results in two daily peaks in the demand for electric power that the transit system imposes upon the supplying electric utility. Reductions in the magnitude of this peak electric power required from the supplying utility can be accomplished by the storage of electric energy on the transit system side of the electric utility/transit interface. To be viable economically the dollar worth of the demand reduction must be sufficiently large to offset the battery storage system initial capital outlay and recurring operating and maintenance costs. The method used to evaluate the merit of deploying battery storage in the transit system was to establish a dollar value for the reduced demand, postulate a system to accomplish these savings, and subtract the life-cycle cost of this system from the savings on the basis of a net present value. This technique was implemented and the results evaluated for different amounts of battery deployment. Battery storage was found to be both technically feasible and economically attractive. It was concluded that the results of the study warranted construction of the pilot plant described in detail in the report.

Prouty, TP  
 AiResearch Manufacturing Company, Department of Energy  
 DOE/ET/25411-T2, Apr. 1983, 150p Contract AC02-79ET25411  
 ORDER FROM: NTIS

**13 380191**  
**REVIEW OF ECONOMIC AND TECHNICAL ANALYSIS AND IDENTIFICATION OF IMPORTANT FACTORS FOR IMPLEMENTATION OF THE CONSTRUCTION PHASE FOR THE RAPID-TRANSIT BATTERY-STORAGE PROJECT. FINAL REPORT**

This study is part of the Rapid-Transit Battery-Storage Project which has determined the technical and economic feasibility of using a battery storage system to reduce the peak electric demand of the New York City Transit Authority (NYCTA). This study provided support to New York State Research and Development Authority (NYSERDA) in three ways, i.e., the economic and technical analyses performed by the systems manager, the Garrett Corp., were reviewed; the obstacles to the construction phase of the project were determined, including permits needed and the environmental effects of the project; and a computer simulation of part of the transit system was made to determine instantaneous substation currents. The technical and economic review was based on previous experience with transit systems and specifically the NYCTA system and in system economics and rates. Environmental effects were determined by reviewing

reports on battery storage. The computer simulation was based on new schedule data from NYCTA and on data previously obtained from NYCTA.

Gibbs and Hill, Incorporated, Department of Energy DOE/ET/25411-T1, 1981, 54p Contract AC02-79ET25411  
 ORDER FROM: NTIS

**13 380192**  
**WHEEL/RAIL FORCE MEASUREMENT AT THE WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY. PHASE 2, VOLUME 1. ANALYSIS REPORT**

In support of the Office of Rail and Construction Technology of the Urban Mass Transportation Administration, the Transportation Systems Center (TSC) is conducting analytical and experimental studies to relate transit truck design characteristics, wheel/rail forces, and wheel/rail wear rates, in order to provide options for reducing the wear rates of wheels and rails experienced by transit properties and minimizing system life cycle costs of vehicle and track components, while maintaining or improving equipment performance.

See also Volume 2, PB83-245480.

Elkins, JA  
 Analytic Sciences Corporation, Transportation Systems Center, Urban Mass Transportation Administration Final Rpt. DOT-TSC-UMTA-82-28, UMTA-MA-06-0025-83-1, June 1983, 81p Contract DTRS-57-80-C-00062

ORDER FROM: NTIS PB83-245472

**13 380193**  
**WHEEL/RAIL FORCE MEASUREMENT AT THE WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY. PHASE 2, VOLUME 2. TEST REPORT**

In support of the Office of Rail and Construction Technology of the Urban Mass Transportation Administration, the Transportation Systems Center (TSC) is conducting analytical and experimental studies to relate transit truck design characteristics, wheel/rail forces, and wheel/rail wear rates, in order to provide options for reducing the wear rates of wheels and rails experienced by transit properties and minimizing system life cycle costs of vehicle and track components, while maintaining or improving equipment performance. As part of this work, TSC planned and implemented an expanded Phase II measurements program in order to obtain onboard wheel/rail force measurements over a representative range of the Washington Metropolitan Area Transit Authority's (WMATA's) operation conditions; obtain data to quantify the load environment of direct fixation fasteners and evaluate the influence of changes in fastener characteristics on performance; evaluate the influence of taper and suspension modification on high speed stability; and assess the feasibility of a retrofit to the WMATA truck to improve curving performance. These tests were conducted in the Fall of 1981.

See also Volume 1, PB83-245472.

Boyd, PJ Zaiko, JP Jordan, WL  
 ENSCO, Incorporated, Transportation Systems Center, Urban Mass Transportation Administration Final Rpt. DOT-TSC-UMTA-83-1, UMTA-MA-06-0025-83-2, June 1983, 93p Contract DTRF-53-80-C-00002

ORDER FROM: NTIS PB83-245480

**13 380205**  
**COLD WEATHER TRANSIT TECHNOLOGY PROGRAM. VOLUME 13: MICROWAVE COUPLING TO ICE/METAL STRUCTURES**

This report is one of a series of reports associated with the Urban Mass Transportation Administration's Cold Weather Transit Technology (CWTT) program that is being implemented through a grant to the University of Notre Dame with the Vought Corporation as the principal contractor. Originally, the program was directed to solutions for automated guideway transit (AGT) system cold weather problems in support of the Downtown People Mover (DPM) program. However, the program has been redirected to focus on obtaining solutions for cold weather problems of existing transit systems. The objective of the CWTT program is to develop new and more effective solutions for cold weather problems experienced by urban mass transportation systems. The report presents laboratory investigation results on the absorption of microwave energy by ice-rail bond interface for typical rail either in use or projected for use by

urban mass transportation systems. This volume describes the research carried out to evaluate rail deicing techniques using microwave energy. The microwave deicing investigation was made to determine the limitations, advantages, disadvantages and material requirements for a prototype and an operational system. The investigation involves insitu and dynamic laboratory measurement of rail microwave energy absorption, temperature rise, ice absorption and microwave cavity requirements. The authors state that further experimental investigations into the development of microwave deicing should employ infrared and thermoptic technologies as means of temperature measurement.

Kwor, RYC Larkin, M Ajmera, PK  
Notre Dame University, Urban Mass Transportation Administration  
Final Rpt. UMTAIN-06-0009-83-13, May 1983, 72p

ORDER FROM: NTIS PB83-263178

**13 380211**

**A FLYWHEEL ACCUMULATOR AS A PROPULSION ELEMENT FOR RAILWAY VEHICLES [SCHWUNGRADSPEICHER ALS ANTRIEBSELEMENT FUER SCHIENENFAHRZEUGE]**

Designed as an energy regenerator accumulator, flywheels are used to recover vehicle braking energy and re-use it for propulsion. An exhaustive study was made on a combined recuperation flywheel/diesel engine. The proportion of recoverable energy has been assessed as well as the conditions warranting use of the system. A computer program was developed to simulate the functioning of a hybrid or conventional propulsion vehicle, and compare travel times and fuel consumption. [German]

Biermann, JW Schraut, W *Eisenbahntechnische Rundschau* Vol. 32 No. 1-2, 1983, pp 99-104, 11 Phot., 9 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

**13 380215**

**COMPUTERIZED STUDY INTO THE OVERHEATING OF VEHICLE WHEELS ON SHOE-BRAKED COMMUTER STOCK [TUSKOS FEKRENDSZERU ELOVAROSI JARMUVEK HOTECHNIKAI VIZSGALATA SZAMITOGEPPEL]**

Commuter traffic poses some of the most difficult operating problems for railway vehicles. Whenever different brake-shoe models are used, a study should be made into the wheel's overheating conditions to prevent tyre loosening. A program has been developed to solve this problem; it is applicable both for rolling stock design and for suburban-traffic planning.

Ferencz, Z *Jarmuvek, Mezogazdasagi Gepek* Vol. 29 No. 11, Nov. 1982, pp 429-436, 1 Tab., 8 Phot., 5 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Lapkiado Vallalat, Lenin korut 9-11, 1073 Budapest 7, Hungary

**13 380217**

**QUESTION B 106. PERMISSIBLE LOADING OF EXTERNAL PARTS OF PASSENGER COACHES**

For the dimensioning and design of the fastening systems of the external components of passenger coaches, certain load assumptions have to be made. At the moment such guidelines are available only on a national scale. This report classifies the components and component assemblies found on the outside of passenger coaches and defines the types of loading to which they may be exposed. The extent of the loadings is also reported. For the more important loadings, reference values are given and certain safety factors recommended.

International Union of Railways ORE B 106/RP 3, Sept. 1982, 55p, 8 Tab., 18 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: UIC

**13 380225**

**MODERN METRO TRACK**

Designing and building rail track are not so very different in a metropolitan railway and on an interurban line, even though the traffic pattern, infrastructure and environmental constraints are extremely dissimilar.

Ballasted track, which is continuously being perfected, is still used on a massive scale by Metro systems. However, because of the constant need to improve antivibration performances and reduce maintenance costs, the method of track-laying on concrete with two resilient layers—and even on floating slabs—is being adopted on a general basis. In this respect, coaching stock with rubber-tyred wheels today represents the optimum solution for Metro systems. French rail-based systems constitute a broad cross-section of these different solutions, ranging from the most classical to the most modern.

Jougla, J-P *Revue Generale des Chemins de Fer* Vol. 102 July 1983, pp 444-446

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

**13 380227**

**BENCH TESTING OF BOGIE FRAMES**

The increased speed of rail traffic has made it necessary to reduce vehicle weights in order to prevent damage to the track, but this has also had the effect of raising stresses in vehicle components, especially bogies. The problem is exacerbated by the longer distance now being covered by some traffic. These weight reductions have only been possible after ensuring that there is no risk of bogie-frame deterioration under operating conditions; test methods have therefore been devised to check whether permanent deformation or fatigue cracks could occur in the frame. Three types of testing are performed: static bench-tests, fatigue tests and running trials. The main purpose of this article is to describe a static test method developed by the Vitry-sur-Seine Test Centre. The importance of "correlating" these tests with fatigue tests and running trials is emphasized. The final section discusses current and future research which should improve testing methods and consequently enhance bogie design.

Leluan, A *French Railway Review* Vol. 1 No. 3, Aug. 1983, pp 233-240

ACKNOWLEDGMENT: British Railways  
ORDER FROM: North Oxford Academic Publishing Limited, 242 Banbury Road, Oxford OX2 7DR, England

**13 380228**

**METHOD OF MEASURING AND PREDETERMINING THE LEVEL OF ACOUSTIC COMFORT IN PASSENGER COACHES**

The acoustic comfort of passenger coaches is determined from noise level readings taken at various points inside and outside the moving train. Although running trials of this type form an essential part of the stock acceptance procedure, they are inconvenient and expensive in terms of acoustic research. For this reason the Vitry Test Centre has developed a method of simulating the noise produced by the running gear of a moving train, using a specially designed hall with reverberant pit. The first section of the article describes how noise of the required intensity and spectral characteristics is produced and measured. This allows experimentation and testing of various structural design modifications in order to identify weak points and determine the real effectiveness of individual components. The second section examines more specifically how air-borne or structure-borne noise enters the vehicle and outlines a method predetermining the overall internal noise level. Given the present state-of-the-art of vehicle design and the materials available for their construction, this method provides the limiting values of acoustic comfort likely to be achieved in passenger coaches running at a given speed.

Reybardy, J *French Railway Review* Vol. 1 No. 3, Aug. 1983, pp 251-260

ACKNOWLEDGMENT: British Railways  
ORDER FROM: North Oxford Academic Publishing Limited, 242 Banbury Road, Oxford OX2 7DR, England

**13 380229**

**TRIAL RUNNING OF THE CLASS 628. 1/928.1 DIESEL RAILCAR**

At the turn of the year 1981/82 five SPNV-VT 627 and three PSNV-VT 628/VS 928 diesel railcars went into regular service in the Kempten area. The design is a development of the successful railcars of 1972/73. Here the author describes the results of a year's trial running with the new vehicles. They are the result of a thorough-going cost/use analysis for both the control-car and power-car versions. The aim was not to obtain an

extremely cheap vehicle, but one which would be economical over its entire life. A comparison of the running costs with those of the obsolescent rail buses and with those of the basic vehicles of 1974 show that the new SPNV-VT railcars have only 71 per cent of the costs of the three-unit rail buses, assuming a distance run of 100,000 km/year. The new vehicles will thus improve the economic performance in local rail services where there is sufficient traffic potential, and will also show the modern railway look on short-distance services. [German]

Gloeckle, H *Eisenbahntechnische Rundschau* Vol. 32 No. 7-8, July 1983, 5p

ACKNOWLEDGMENT: British Railways  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

**13 380231**  
**ELECTRIFICATION OF AN URBAN TRANSIT SYSTEM**

When planning for an electrified urban transit system the first step consists of defining a number of basic criteria such as the supply voltage level, current collection method, and structure of the electrical network to be set up. As regards the major options to be taken, the authors examine the parameters to be taken into account, the selection criteria, the constraints of different origin, and evaluate the specific importance attached to each of them by virtue of the nature of the transport mode and its infrastructure. Lastly and quite apart from the constraints inherent in the necessary limitation of noise levels and vibratory phenomena, they examine the electric interferences that can be caused by an electrified line in a dense urban environment, and indicate current trends in the sphere of prevention and protection.

Delattre, D *Revue Generale des Chemins de Fer* Vol. 102 July 1983, pp 430-436

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

**13 380234**  
**A TRUCK WITH INDEPENDENT WHEELS [CARRELLO A RUOTE INDIPENDENTI]**

In the framework of the Final Transport Plan, the Fiat Research Centre proposed the study and implementation on a trial basis of a body-shell and trucks with independent wheels. In the report, the Research Officer illustrates the design philosophy of the truck with independent wheels, self-steering in curves with a high flexibility single-suspension working in accordance with the three main axes of inertia. [Italian]

Panagin, R *Ingegneria Ferroviaria* No. 10, Oct. 1982, pp 651-664, 3 Fig., 1 Tab., 9 Phot., 3 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: ESL DOTL JC

**13 380235**  
**MODERN TRUCKS FOR UNDERGROUND TRAINS [MODERNI CARRELLI PER METROPOLITANE]**

Special attention is paid to basic technical problems for the study of a railway bogie, i.e. running safety and comfort, and reliability in general. [Italian]

Masi, A Calamai, R *Vie e Trasporti* No. 498-499, Jan. 1983, pp 21-43, 27 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Casa Editrice la Fiaccola, Via Ravizza 62, Milan, Italy

**13 380236**  
**STATISTICAL METHODS AND RAILWAY DYNAMICS [METODI STATISTICI E DINAMICA FERROVIARIA]**

Unwanted movements of railway vehicles are caused by track irregularities, which are randomly distributed. Consequently, statistical type methods are necessary either for the preparation of experimental results or for design. After a survey of the main statistical functions, this article describes the calculation processes and illustrates them by means of a simplified model with three degrees of freedom which makes it possible to emphasize the importance of track quality on the dynamic behaviour of vehicles. [Italian]

Bonadero, A *Ingegneria Ferroviaria* No. 11, Nov. 1982, pp 721-741, 28 Phot., 20 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: ESL DOTL JC

**13 380238**  
**PRESENT STATE OF TECHNICAL DEVELOPMENT OF DIRECT TRACK LAYING AND ITS APPLICATIONS [STAND DER TECHNOLOGISCHEN ENTWICKLUNGEN ZU FESTEN FAHRBAHNEN UND DEREN ANWENDUNG]**

After a general survey of the type of unballasted track developed the world over, the author presents the experience gained over 10 years with the Rhedo track system which, when correctly calculated and laid, can indeed replace conventional unballasted track. [German]

Eisenmann, J Duwe, B *Eisenbahningenieur* Vol. 34 No. 3, Mar. 1983, pp 97-104, 1 Tab., 13 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Tetzlaff-Verlag GmbH, Havelstrasse 9, Postfach 4006, 6100 Darmstadt 1, West Germany

**13 380244**  
**THE DYNAMICS OF ACTIVE WHEELSETS WITH RUBBER SUSPENDED IN RAILWAY VEHICLES WITH NOSE-SUSPENDED MOTORS [DIE DYNAMIK ANGETRIEBENER GUMMIGEFEDERTER RADSATZTE VON SCHIENENFAHRZEUGEN MIT TATZLAGERANTRIEBEN]**

This article deals with dynamic reactions produced by a sprung wheel in a speed range of 20-200 km/h. Research concerns an active wheelset driven by a nose-suspended motor and running on damped rails. The results agree with those obtained by British Railways and Soviet Railways. It would appear that dynamic reaction can be reduced by 50% by using a sprung wheel instead of the rigid wheelset because of a dephasing effect which occurs between the forces of inertia in the rings and the dynamic forces of the power unit. This is a result of great significance for the design of high-speed vehicles. [German]

Golubenko, A Krettek, O *Glaser's Annalen ZEV* Vol. 107 No. 4, 1983, pp 120-128, 5 Tab., 7 Phot., 7 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: ESL DOTL JC

**13 380249**  
**THREE-DIMENSIONAL TESTING AND MODELING OF BALLAST**

A series of triaxial tests was performed on two sizes of a railroad ballast under different stress paths and with a constant (initial) field density. The results permit development of nonlinear elastic and plasticity constitutive models. The commonly used resilient modulus model and a variable moduli model were developed as simplified characterization. The behavior of the ballast was found to be dependent on the state of stress, stress paths and particle size.

Janardhanam, R (North Carolina University); Desai, CS *Journal of Geotechnical Engineering* Vol. 109 No. 6, June 1983, pp 783-796, 18 Ref.

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**13 380250**  
**THERMAL SHORT-CIRCUIT CAPACITY OF OVERHEAD CONTACT SYSTEMS [DIE THERMISCHE KURZSCHLUSSFESTIGKEIT VON OBERLEITUNGS-KETTENWERKEN]**

In the evaluation of the maximum permissible short-circuit currents, which do not lead to thermal overload of parts of the overhead contact system the behaviour of the short-circuit current has to be considered. It is influenced by the transient process as well as the unsteady current distribution within the overhead contact system due to different heating of aparcular conductors of the overhead contact system. A program for a digital computer represents these connections. [German]

Kleinschmidt, Horst (Stuttgart University, West Germany); Boegle, Dieter *Elektrische Bahnen* Vol. 81 No. 3, Mar. 1983, pp 66-70

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**13 380251**  
**EFFECTS OF CIRCUIT PARAMETERS ON THE DISTURBING CURRENT OF CONVERTER FED TRACTIVE UNITS [EINFLUESSE VON SCHALTUNGSPARAMETERN AUF DEN STORSTROM STROMRICHTERGESPEISTER TRIEBFAHRZEUGE]**

The slope steepnesses are decisive for the disturbing current within the line current flow, which is caused by converter fed tractive units. For the sector-controlled single-phase bridge circuit the commutating inductance, the smoothing inductance and the dimensioning of the quenching installation influence the disturbing current. Due to the self-commutation a greater disturbing current occurs as compared with only line commutated circuits. This disturbing current is reduced by filtering circuits. [German]

Beckers, VW (RWTH, Aachen, West Germany); Gaul, H Mueller-Hellman, A *Elektrische Bahnen* Vol. 81 No. 3, Mar. 1983, pp 72-77, 9 Ref.

ACKNOWLEDGMENT: EI  
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**13 380252**  
**COMPARISON OF THE CHARACTERISTICS OF TRAIN OPERATION IN RAPID TRANSIT FROM THE JAPANESE POINT OF VIEW CONCERNING THE APPLICATION OF DIFFERENT DRIVES [VERGLEICH DER KENNDATEN DES ZUGBETRIEBES IM NAHVERKEHR BEI ANWENDUNG UNTERSCHIEDLICHER ANTRIEBSSYSTEME AUS JAPANISCHER SICHT]**

The correlation between train operation (average speed, energy consumption and so on) and the characteristics of the drive system is of importance for the selection of the drive. The authors compare the three-phase current drive with the dc drive with chopper control as well as with rheostatic control for rapid short-distance trains. For the dc drive they refer to earlier studies of the Japanese committee "Operating characteristics of electric railways". The correlations of the three-phase current drive are derived. It is shown for short intervals between two stops that the dc operation with chopper is optimal, for greater intervals between two stops the three-phase current drive offers greater advantages. [German]

Masada, E (Tokyo University, Japan); Sattler, PK *Elektrische Bahnen* Vol. 81 No. 3, Mar. 1983, pp 78-84, 5 Ref.

ACKNOWLEDGMENT: EI  
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**13 380253**  
**PROSPECT OF FUTURE DRIVE TECHNIQUES IN THE FIELD OF ELECTRIC TRACTION [EIN AUSBLICK AUF ZUKUNFTIGE ANTRIEBSTECHNIKEN IN DER ELEKTRISCHEN TRAKTION]**

In recent years, such new power semiconductors such as the reverse conducting thyristor, the gate-turn-off thyristor, the static-induction-transistor and the field controlled thyristor have made their appearance in the electronic market. These new components lead to partially new or simplified solutions for choppers or inverters. A description is given of the function of the new elements, of some restrictions which should be observed at utilization and of the effects on circuits. [German]

See also Vol. 81 No. 2 pp 42-44, February 1983 issue of *Elektrische Bahnen*.

Schroeder, D (Kaiserslautern University, West Germany) *Elektrische Bahnen* Vol. 81 No. 1, Jan. 1983, pp 11-17, 12 Ref.

ACKNOWLEDGMENT: EI  
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**13 380254**

**SOME CONSIDERATIONS ON DEVELOPMENTS IN THE FIELD OF ELECTRIC TRACTION AT THE NETHERLAND RAILWAYS [EINIGE BETRACHTUNGEN UEBER ENTWICKLUNGEN AUF DEM GEBIET DER ELEKTRISCHEN ZUGFOERDERUNG BEI DEN NIEDERLAENDISCHEN EISENBAHNEN]**

At present the Netherland Railways (NS) modernize their rolling stock. The electric locomotive series 1600 has been already equipped with chopper control. A solid state inverter is used in the modern intercity passenger cars. Further development is characterized by the utilization of three-phase current drive technique, energy savings by flywheel and application of microprocessors. A description is given of the tractive unit installations of the automatic train-running control. By methods of the theory of electric networks, the NS have developed a computing program which makes it possible to calculate the currents and the voltage of the overhead system, the distribution of current within the overhead system network, power and energy to be supplied by the substations and short-circuit currents. [German]

See also Vol. 81 No. 2 pp 45-53, February 1983 issue of *Elektrische Bahnen*.

Tuyten, E (NV Nederlandse Spoorwegen, Utrecht, Netherlands); Gielissen, T Frints, P Berger, L Venemans, D *Elektrische Bahnen* Vol. 81 No. 1, Jan. 1983, pp 22-27, 2 Ref.

ACKNOWLEDGMENT: EI  
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**13 380255**

**ELECTRIC INSTALLATIONS IN MODERN PASSENGER COACHES OF COMMUTER AND LONG DISTANCE TRAFFIC 43 82 [ELEKTRISCHE EINRICHTUNGEN IN MODERNEN REISEZUGWAGEN DES NAH UND FERNVERKEHRS]**

Modern passenger coaches are standardized for the four current systems 1000 v/16-2/3 Hz ac, 1500 v/50 Hz ac, 1500 v-dc, and 3000 v-dc. The electric energy is delivered by the bus-bar of the train. A description is given of the circuitry of single voltage and multivoltage coaches. The hv devices of modern passenger coaches comprise hv contactors, electric radiators, transformers, electronic dial system and grouping equipment, and four-system energy supply block. The hv devices are the vehicle battery, a solid-state battery charge, central switch board, lighting, blower inverter and loudspeaker installation. [German]

See also Vol. 81 No. 3 pp 85-88, March 1983 issue of *Elektrische Bahnen*.

Fischer, W (AEG Telefunken) *Elektrische Bahnen* Vol. 81 No. 2, Feb. 1983, pp 35-38, 5 Ref.

ACKNOWLEDGMENT: EI  
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**13 380257**

**NOVEL PWM TECHNIQUE MINIMIZING THE PEAK INVERTER CURRENT AT STEADY-STATE AND TRANSIENT OPERATION**

For the control of PWM inverters optimal pulse patterns are defined with the objective of minimizing the peak inverter current. Special attention is given to three-state inverters as applied to high power ac motor traction drives. The optimization relates to steady-state and transient operating conditions. Experimental results are illustrated by oscillograms.

See also Vol. 81 No. 3, March 1983 issue of *Elektrische Bahnen*.

Holtz, J (Gesamthochschule Wuppertal, West Germany); Stadtfeld, S Wurm, H-P *Elektrische Bahnen* Vol. 81 No. 2, Feb. 1983, pp 55-61, 9 Ref.

ACKNOWLEDGMENT: EI  
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**13 380781**

**ASPHALT IN RAILWAY ROADBEDS**

While asphalt layers have been used on a limited basis in track structures for more than 50 years, there is a lack of documentation on most early installations. The asphalt industry is supporting research by the University of Kentucky in collaboration with participating railroads to (1) develop a comprehensive structural design system for railroad track structures; (2)

evaluate performance of various track structural compositions; and (3) develop appropriate techniques for use in asphalt track structures. The greatest benefits are found where adverse soil and moisture conditions exist so that track maintenance problems are severe. The asphalt layer can provide added stability and durability, improve performance, and reduce maintenance. Details of some installations are given.

Asphalt Institute, National Asphalt Pavement Association Nov. 1983, 11p, 10 Fig.

ORDER FROM: Asphalt Institute, Asphalt Institute Building, College Park, Maryland, 20740

### 13 380788 LIGHT RAIL VEHICLES

In January 1983 the Victorian Government made an announcement that could have far reaching consequences on public transport in Melbourne. There is great significance in the planned conversion of the "heavy rail" routes serving Port Melbourne and St Kilda to "light rail" lines, the reasons for this policy being explained. An examination is also made of the proposed introduction of articulated light rail vehicles on these routes, as this type of rolling stock has not been seen previously in Melbourne. Mention is also made of a new conventionally electrified railway between the suburbs of Altona and Laverton.

Wright, K *Newsrail* Vol. 11 No. 1, Feb. 1983, p 20

ACKNOWLEDGMENT: ATLS Bulletin  
ORDER FROM: Newsrail, Melbourne, Victoria, Australia

### 13 380808 REPORT OF THE OPERATIONAL SERVICE TRIALS OF THE LOCOMOTIVE CLASS 120 FROM 1980 TO 1982 [BERICHT UEBER DIE BETRIEBSPROBUNG DER LOKOMOTIVE BAUREIHE 120 IN DEN JAHREN 1980 BIS 1982]

A description is given of the state of the operational service trials of the locomotives class 120 of the West German Railroad System. Advantages of the three-phase drive technique of this locomotive class compared with locomotives with traditional step control are shown. A summary of the essential results of the service trials and technical investigations is included. [German]

Harprecht, W (Hauptverwaltung der Deutschen Bundesbahn);  
Spoehrer, W Keli, W *Elektrische Bahnen* Vol. 81 No. 4, Apr.  
1983, 8p, 32 Ref.

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

### 13 380809 ELECTRIC TRACTION ON BRITISH RAILWAYS DURING 1982

The authors record the completion of the Midland Suburban electrification scheme during 1982 and note that construction work commenced on the extension of electrification from Colchester to Ipswich, Harwich and Norwich. Reference is made to the latest developments in the field of control of electrification systems and to developments in components of overhead line equipment, covering an insulating section for 200 km/hr operation, a flexible insulator for use with restricted electrical clearances and a new design of return conductor insulator. A description of BR's instrumented test coach MENTOR and of a height and stagger gauge using laser beams is included. The class 317, 25kv electric multiple units for the Midland Suburban scheme, the class 455, 750v dc units for the Southern Region and the development of the class 89, 25kv locomotive for 200 km/hr running are also described.

Wojtas, BJ (Railroad Technical Center); Sandham, B *Elektrische Bahnen* Vol. 81 No. 4, Apr. 1983, pp 113-117

ACKNOWLEDGMENT: EI  
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### 13 380816 TENSION STRAIGHTENING AND DESTRESSING OF RAILS [DRESSAGE ET DETENSIONNEMENT DES RAILS PAR TRACTION]

Presentation of a tension straightening process studied, developed and patented by SACILOR (Lorraine Steel and Rolling Mills Company) from 1979 to 1982, with technical (straightening, destressing, higher elasticity

values) advantages as well as economic ones (no additional investment in hydraulic presses to straighten ends, lower operating costs than those for roller straightening). [French]

Deroche, R-Y Faessel, A Bourdon, Y *Revue Generale des Chemins de Fer* No. 7-8, 1983, pp 461-464, 3 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: ESL

### 13 380821 METHOD APPLICABLE TO THE ASSESSMENT OF RAILWAY VEHICLE SAFETY AND RIDING QUALITY IN THE EVENT OF CROSS WINDS AND FAULTY TRACK ALIGNMENT [METHODE ZUR VORAUSBERECHNUNG DER SICHERHEIT UND DER LAUFGUETE VON EISENBAHNFahrZEUGEN BEI SEITENWIND UND UEBERLAGERTEN RICHTUNGSFEHLERN]

Aerodynamic considerations applied to high-speed railway vehicles include vehicle behaviour in the event of cross wind or gusts of wind. With the model presented in this article, it is possible to calculate accurately vehicle response to these situations, taking into account faulty alignment of the track. The use of this linear calculation model and its limits are demonstrated by means of a calculation example concerning 103 series locomotives. [German]

Sachs, D *Glaser's Annalen ZEV* Vol. 107 No. 6, June 1983, pp 181-188, 10 Phot., 10 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: ESL

### 13 381016 THE USE OF ALUMINIUM IN THE FIELD OF PASSENGER ROLLING STOCK, FREIGHT CARS AND BOGIES IN EUROPE AND THE U.S.

Railway rolling stock in aluminium today has reached a technological level making it fully competitive against steel. An increasing number of new vehicles is proving it. Before the aluminium design will come to a complete breakthrough, some non-technical obstacles must be overcome. [German]

Zehnder, J *Glaser's Annalen ZEV* Vol. 107 No. 8-9, Aug. 1983, pp 320-325

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

### 13 381017 CORRELATION BETWEEN THE DESIGN AND UTILIZATION OF MODERN RAIL VEHICLES

In this paper, the term "modern railway vehicles" denotes vehicles of improved design, enabling a better utilization and thus a higher profit to be attained. The correlation between the design of modern rail vehicles and their utilization in terms of their earning power characteristics is discussed and supported by means of examples. The proposed characteristics, are derived from one curve representing the capital costs, the curve representing the operating costs, the resulting cumulative curve, and the curve representing the profit, all curves being plotted as functions of the utilization time. Such characteristics enable an assessment of the profit to be expected during the optimum utilization period of the vehicle. The proposed characteristics will aid the railway administrations in decision-making when purchasing new vehicles. Moreover, if continuously updated, they will enable checks on the lifetime profit earning capacity of a particular vehicle. [German]

Lisowski, Z *Glaser's Annalen ZEV* Vol. 107 No. 8-9, Aug. 1983, pp 250-252

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

### 13 381018 APPLICATIONS OF FIBRE REINFORCED PLASTIC COMPOSITES IN THE RAILWAY INDUSTRY

This paper describes the use of fibre reinforced plastics in the railway industry. A description is given of various case studies, including seat shells, temporary overhead structures, pantograph heads, cab fronts and doors, in order to give a practical illustration of the various applications to which such plastics can be put. The paper also deals with design criteria

such as stiffness, strength, flammability, durability and cost effectiveness, quoting comparative figures. Finally, the paper looks at future developments, specifically the use of higher performance carbon and aramid fibres, both of which are discussed, after which a brief description is given of fibre reinforced thermoplastics for performance applications.

Batchelor, J Wilson, JE Institution of Mechanical Engineers  
 Proceedings Reprint Vol. 197 No. 97, 1983, 7p

ACKNOWLEDGMENT: British Railways  
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**13 381019**  
**CONCRETE FRAMES STABILIZE AUSTRIAN TEST RACK**

Early results of an experiment south of Vienna have confirmed that rectangular concrete frames developed in the USSR as an alternative to sleepers do indeed reduce the maintenance requirement. This could be of particular advantage on high speed lines.

Braun, WM Railway Gazette International Vol. 139 No. 10, Oct. 1983, p 795

ACKNOWLEDGMENT: British Railways  
 ORDER FROM: ESL

**13 381020**  
**NEW PASSENGER CAR BOGIES: SELECTION METHOD AND PERFORMANCE OF BOGIE MD. 52**

To select the most suitable type of bogie for a new generation of passenger cars of Deutsche Bundesbahn (DB) from a number of proven and newly developed types, the cost effective analysis was applied. The manufacturing cost was determined by inviting quotations; the maintenance costs were determined by way of sample decomposition and time assessment. Nonmonetary parameters (running properties, construction and performance) were weighted and then subjected to a sensitivity analysis. Bogie MD 52 was established to be the optimum solution. The paper briefly reports on the running properties and the Y-forces of this bogie. In spite of the large number of lines with many curves in DB's IC network, it has been possible to minimise tyre wear, resulting in lengthening of the inspection interval to 650,000km plus or minus 10%, with 1 million km appearing feasible in steps. [German]

Madeyski, T von Glasers Annalen ZEV Vol. 107 No. 8-9, Aug. 1983, pp 253-258

ACKNOWLEDGMENT: British Railways  
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**13 381509**  
**BILEVEL MOTORCOACHES IN PARIS**

To increase the capacity of the Parisian Regional Express System (RER), French National Railways is supplementing its bilevel trailer cars with powered electric multiple units of the same general design. Since two passenger levels in a motor car reduce space available under the floor for electrical components, traction equipment is located in compartments within the carbody. Some cars are designed for operation only from dc supply; others incorporate dual-voltage capabilities for also running under SNCF's 25kv ac catenary. Other features of the new commuter rolling stock are described.

Cooper, BK Modern Railways Vol. 40 No. 423, Dec. 1983, pp 627-628

ORDER FROM: Allan (Ian) Limited, Terminal House, Shepperton TW17 8AS, Middlesex, England

**13 381514**  
**DESIGN LOADS AND SAFETY MARGINS FOR PASSENGER COACHES AND MOTIVE POWER UNITS**

Decades of research work have been necessary to determine the strength requirements for passenger cars and motive power units on the basis of tests and experience available from accidents. The strength requirements are briefly discussed. The reasons are given for the justification of the present buffer load of 200 kN or 1500 kN, respectively. Reductions appear feasible by an increase in the energy absorption capacity of the passenger coach buffers and by implementing appropriate measures on the locomotives. The designers should provide cars with certain defined zones for energy absorption by plastic deformation. [German]

Felsing, A Glasers Annalen ZEV Vol. 107 No. 10, Oct. 1983, pp 344-348

ACKNOWLEDGMENT: British Railways  
 ORDER FROM: ESL

**13 381515**  
**RESULTS OF TEST ON THE DB'S EXPERIMENTAL WAVY-RAIL SET**

Wavy or corrugated rail surfaces have been an unsolved problem for decades, and have given rise to many theoretical and experimental investigations. The aim of the research, which is often costly, is to find out what causes wavy rails and to reduce the extent and intensity of these influences. The results of investigations at the two wavy-rail test set-ups at the DB's Central Office in Munich show that the material of the DB's standard rails—the S 54 and the UIC 60—has no influence, neither in respect of the chemical analysis, nor the internal rail stress, nor the position in the bloom. On the other hand, it appears that the surface roughness of the rail, the coefficient of subgrade reaction, the vibrational behaviour of the whole system, the likewise vibrating mass and the excitation may have a decisive influence on the appearance of wavy rails. [German]

Kaess, G Eisenbahntechnische Rundschau Vol. 32 No. 10, Oct. 1983, 6p

ACKNOWLEDGMENT: British Railways  
 ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

**13 381517**  
**GENERAL FEATURES OF RAILWAY VEHICLE MANUFACTURING PROCESSES WITH LIGHT ALLOY EXTRUSION [CARACTERISTICAS GENERALES DEL PROCESO CONSTRUCTIVO DE VEHICULOS FERROVIARIOS CON EXTRUSIONES DE ALEACION LIGERA]**

The author describes the advantages of using alloys for construction purposes—the fact that the extrusion manufacturing method can be used, easy shaping, and the vast range of finishing methods available. [Spanish]

Alfaro, JL AIT-Revista Vol. 51 Apr. 1983, pp 68-76, 18 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
 ORDER FROM: Asociacion de Investigacion del Transporte, Alberto Alcocer 38, Madrid, Spain

**13 381521**  
**ORE—QUESTION D 117. COMPARATIVE STUDY OF THE BEHAVIOUR OF DIFFERENT TYPES OF SUB-STRUCTURE LAYERS (TEMPERATURE, WATER CONTENT AND SOIL PRESSURE MEASUREMENTS): TESTS IN OSTERMUNCHEN STATION**

Various sub-structure layers were compared under normal running conditions: gravel, gravel reinforced with cement, asphalt concrete, crushed lava slag (lavalit) and styrodur plates embedded in gravel. The tests carried out enabled the behaviour of these sub-structure layers to be studied as regards thermal insulation, water content and soil pressure: (1) Temperature measurements made with thermocouples showed the excellent insulation effect of the styrodur plates; (2) Water content measurements with radiation probes showed low values in the upper part of a 50 cm gravel layer as well as above the styrodur plates; (3) Due to the influence exerted by other parameters (track quality, track geometry) the soil pressure measurements with pressure cells did not permit the 4 examined types of sub-structure layers to be classified. The scatter in measured values was very large for conventional mixed traffic. The scatter in measured values for high speed traffic (with well-maintained vehicles designed for the purpose) remained within the range for conventional mixed traffic.

International Union of Railways ORE D 117/RP 23, Sept. 1982, 43p, 55 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
 ORDER FROM: UIC

13 381530

**A VERTICALLY AND HORIZONTALLY ADJUSTABLE RAIL FASTENING FOR NON-BALLASTED TRACK [HOEHEN—UND SEITENVERSTELLBARE SCHIENENBEFESTIGUNG FUER SCHOTTERLOSEN OBERBAU]**

When a non-ballasted track laid on a bridge is fitted with fixed rail fastenings the inevitable imprecision which creeps into the slab manufacturing process and laying of the sleepers on the bridge girders is reflected in the track bed. The degree of precision required can then only be achieved through costly refitting with adjustable fastenings; the relatively wide adjustment margin allows precision faults in the track bed to be offset. [German]

Pichlmaier, R *Eisenbahningenieur* Vol. 34 No. 8, Aug. 1983, pp 446-453, 12 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Tetzlaff-Verlag GmbH, Havelstrasse 9, Postfach 4006, 6100 Darmstadt 1, West Germany

13 381538

**INCREASE IN THE CAPACITY OF PUSH-PULL OPERATED TRAINS. THE NEW ITALIAN DOUBLE-DECK COACHES FOR SUBURBAN TRAFFIC [LEISTUNGSSTIEGERUNG IM WENDEZUGBETRIEB. DIE NEUEN ITALIENISCHEN DOPPELSTOCKWAGEN FUER DEN NAHVERKEHR]**

After a fairly long testing period of the French double-decker coaches in the Milan region, the Italian State Railways (FS) and the North Milan Railway (FNM) have decided to purchase this type of stock for push-pull operated suburban trains. The Italian manufacturer, working under licence, has delivered to the two railways, 174 centre trailers and trailers with driver's cabs, and is presently developing double-decker railcars for electric or diesel traction operation. A first prototype has recently been presented. [German]

Messerschmidt, W *Hestra-Verlag* Vol. 32 No. 7-8, 1983, pp 501-503, 6 Phot., 2 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

13 381541

**METROS IN FRANCE AND ABROAD [METROS DE FRANCE... ET D'AILLEURS]**

This publication first reviews current metro-building projects in France, describing the techniques used (Paris: extension of line no. 5; Marseille: extension of line 2 in the North and South; Lyon: line D under the Rhone and Saone; Lille: "Republique—C.H.R.B. Calmette" section); and then lists projects abroad in which French firms have been involved (Hong Kong, Cairo, Lagos). [French]

*Chantiers de France* No. 162, July 1983, pp 1-52, 10 Fig., 10 Phot., 10 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: STEPE, 16 rue Vezelay, 75008 Paris, France

13 381549

**BALLAST AND SUBGRADE REQUIREMENTS STUDY: RAILROAD TRACK SUBSTRUCTURE—MATERIALS EVALUATION AND STABILIZATION PRACTICES**

Earth materials—i.e., soil and rock—form the substructure of all railroad track. In this report, the functions and performance characteristics of each of the substructure elements (i.e., ballast, subballast, and subgrade), and the material properties that influence the substructure performance are described. In addition, guidelines are provided for their use in railroad track.

See also PB83-262501. Also available in set of 3 reports PC E99, PB83-262485.

Simon, RM Edgers, L Errico, JV  
Goldberg-Zoino and Associates, Incorporated, Federal Railroad Administration, Transportation Systems Center Final Rpt. FRA/ORD-83/04.1, DOT-TSC-FRA-82-3, June 1983, 386p

ORDER FROM: NTIS PB83-262519

13 381550

**BALLAST AND SUBGRADE REQUIREMENTS STUDY: RAILROAD TRACK SUBSTRUCTURE—DESIGN AND PERFORMANCE PRACTICES**

Earth materials—i.e., soil and rock—form the substructure (ballast, subballast, and subgrade) of all railroad track. In this report, the most suitable technology and design criteria as related to design of the substructure are identified based on a review of current track substructure design procedures employed in the United States and foreign countries. A primary emphasis has been placed on identifying an approach for rational design of track to support vertical, lateral, and longitudinal loads. Principal design parameters and available analytic and empirical design procedures are discussed.

See also PB83-262493 and PB83-262519. Also available in set of 3 reports PC E99, PB83-262485.

DiPilato, MA Steinberg, EI Simon, RM  
Goldberg-Zoino and Associates, Incorporated, Dyer (Thomas K), Incorporated, Federal Railroad Administration, Transportation Systems Center Final Rpt. FRA/ORD-83/04.2, DOT-TSC-FRA-82-4, June 1983, 178p

ORDER FROM: NTIS PB83-262501

13 381551

**BALLAST AND SUBGRADE REQUIREMENTS STUDY: SUMMARY AND ASSESSMENT REPORT**

Earth materials—i.e. soil and rock—form the substructure of all railroad track. In this report a summary and assessment is presented with respect to current and available practices for substructure (ballast, subballast, and subgrade) materials evaluation and selection, stabilization, design and analysis, and performance evaluation.

See also PB83-262501. Also available in set of 3 reports PC E99, PB83-262485.

Simon, RM DiPilato, MA  
Goldberg-Zoino and Associates, Incorporated, Federal Railroad Administration, Transportation Systems Center Final Rpt. FRA/ORD-83/04.3, DOT-TSC-FRA-82-5, June 1983, 85p Contract DOT-TSC-1527

ORDER FROM: NTIS PB83-262493

13 381591

**EXPERIMENTAL STUDY ON LATERAL RESISTANCE OF TRACK SKELETON IN BALLAST**

Lateral resistance of a track skeleton in ballast is very important for track lateral stability against thermal force in rail and against lateral loads from vehicles. Recent test results made clear the share of resistance owing to the bottom, sides, and end of ties in various track conditions. An approximate formula to analyze resistance has been proposed. On this paper, a study is reported that considers the effect of the ballast shoulder on elastoplastic and plastic-type resistance. In addition, the effect of rainfall and tie safety cap is discussed.

Sato, Y Hamazaki, S *Railway Technical Research Inst, Quarterly Reports* Vol. 24 No. 1, Mar. 1983, pp 40-41

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

13 382245

**TRANSISTORIZED PWM INVERTER-INDUCTION MOTOR DRIVE SYSTEM**

The development of a transistorized pulsewidth modulated (PWM) inverter-induction motor traction drive system is described. A vehicle performance analysis was performed to establish the vehicle tractive effort-speed requirements. These requirements were then converted into a set of inverter and motor specifications. The inverter was a transistorized three-phase bridge using General Electric power Darlington transistors. The high-speed induction motor is a design which is optimized for use with an inverter power source. The primary feedback control is a torque angle control with voltage and torque outer loop controls. A current-controlled PWM technique is used to control the motor voltage. The drive has a constant torque output with PWM operation to base motor speed and a constant horsepower output with square wave operation to maximum



speed. The drive system was dynamometer tested, and the results are presented.

Peak, SC (General Electric Company); Plunkett, AB **IEEE Transactions on Industry Applications** Vol. IA-1 No. 3, May 1983, pp 379-387, 7 Ref.

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**13 382252**  
**GTO INVERTER FOR AC TRACTION DRIVES**

A 600-kVa capacity GTO inverter for traction drives has been developed using 2500-V/1000-A gate turn-off (GTO) thyristors, and running tests have been carried out. To utilize the advantages of GTO thyristors, circuit inductance of both main loops and snubber loops were minimized in order to decrease overvoltage applied to GTO thyristors after turn-off. Appropriate protection systems for the GTO inverter against commutation failure and overcurrent in traction motors were developed. Running tests for an electric car driven by the GTO inverter showed good control characteristics.

Ueda, A (Hitachi Limited); Ihamoto, M Narita, H Hori, T Tsuboi, T Yamada, Y **IEEE Transactions on Industry Applications** Vol. IA-1 No. 3, May 1983, pp 343-348, 4 Ref.

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**13 382254**  
**TEST OF REGENERATIVE BRAKE SYSTEM OF AC ELECTRIC MULTIPLE UNIT CAR**

Experimental studies of an ac regenerative braking system were conducted using a model circuit consisting of a miniature transformer and by computer analysis of the primary current wave form. Based on the results, a prototype ac regenerative brake system was produced in 1977, including transformer, rectifier, step-controller. Basic performance tests of these equipments were done on rolling stock testing plant of Japan National Railways. Running tests for investigating the performance of power running and the regenerative brake were carried out in September 1981. At the same time, the telecommunication lines and the signal system were studied. This paper reports the study results.

Toshima, M Oishi, M Sugai, M Suzuki, M **Railway Technical Research Inst, Quarterly Reports** Vol. 24 No. 2, June 1983, pp 91-92

ACKNOWLEDGMENT: EI  
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**13 382255**  
**EVALUATION OF RAIL HEAD SURFACE CONFIGURATION VIEWED FROM WHEEL LOAD VARIATION**

In high speed railway operations, wheel load variation is thought to originate primarily from the forced vibrations due to relations between longitudinal rail head surface and wheels supported by track spring. Effective measures for decreasing it include decreasing the unsprung mass and controlling the wheel surface on the vehicle side, softening the track spring and controlling the rail head surface configuration on the track side. This paper reports on a study of the rail head surface configuration and evaluates it from the point of view of wheel load variation. It points out sections which require maintenance and certifies the effect of the measures taken.

Sato, Y Kosuge, S **Railway Technical Research Inst, Quarterly Reports** Vol. 24 No. 2, June 1983, pp 68-71

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**13 382258**  
**DEVELOPMENT OF CEMENT-ASPHALT MORTAR FOR SLAB TRACKS IN COLD CLIMATE**

An experimental study was carried out to develop a durable cement-asphalt mortar as an under-slab filling for tracks on Tohoku and Joetsu Shinkansen lines in Japan. The study has revealed that development of durable cement-asphalt mortar will be possible by introducing entrained-air. This paper gives an outline of the development and experimental study of cement-

asphalt mortar characterized by anti-freezing and thawing, mechanical properties, construction methods, and related subjects.

Harada, Y Tottori, S Itai, N Noto, T **Railway Technical Research Inst, Quarterly Reports** Vol. 24 No. 2, June 1983, pp 62-67

ACKNOWLEDGMENT: EI  
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**13 382261**  
**PROJECT STUDY FOR A STANDARD GAUGE RAILROAD LOCOMOTIVE WITH LOAD INDEPENDENT DC CURRENT INTERMEDIATE CIRCUIT [PROJEKTSTUDIE FUER EINE VOLLBAHNLOKOMOTIVE MIT STROMGEFUEHRTEM DREHSTROM-ANTRIEBSSYSTEM]**

Based on experience of its own three-phase current test unit AEG-Telefunken has worked out a design for a locomotive with three-phase current drive technology. With four wheel sets and a nominal output of about 5 mw it is suitable for universal utilization in passenger and freight trains and can be designed either for the 15 kv/16 2/3 Hz or the 25 kv/50 Hz current system. After system tests with 16 2/3 Hz the traction characteristics of the applied current source converter system can be considered as satisfactory. [German]

Boehm, H (AEG-Telefunken); Dreimann, K Zoellner, F **Elektrische Bahnen** Vol. 81 No. 7, July 1983, pp 239-245, 10 Ref.

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**13 382269**  
**COLD WEATHER TRANSIT TECHNOLOGY PROGRAM. VOLUME 6: WINTERIZATION OF SELF-VENTILATED TRACTION MOTORS ON RAPID TRANSIT VEHICLES**

The Cold Weather Transit Technology (CWTT) Program was initiated to develop new and effective methods for assuring the dependable operation of transit systems in severe cold, ice, and snow. The CWTT program is being implemented by UMTA through a grant to the University of Notre Dame with the Vought Corporation as the principal contractor. The objectives of this study was to investigate the perceived traction motor failure problem, the evaluation and development of prototype hardware to overcome the problem, and the subsequent evaluation of that hardware in an operating transit system environment. This report documents the successful development and evaluation of a system designed to reduce the failure rate of self-ventilated traction motors used in cold climate cities. Forced ventilation with clean, dry air appeared to provide a suitable solution. Tests were conducted on filters and separators that could eliminate the contaminants and provide the clean dry air. All devices proved unsatisfactory. A low velocity inlet separator was developed in the laboratory where it proved highly successful in separating snow and freezing mist. This new system was then committed to prototype design for installation on two rapid transit cars of the Chicago Transit Authority. These cars have been operated through 1983 with a high degree of success. Cost benefit analysis of the system indicated that it could be economically incorporated into a transit system's self-ventilated traction motor propelled cars.

Koonce, BL  
Vought Corporation, Urban Mass Transportation Administration Final Rpt. UMTA-IN-06-0009-83-6, Nov. 1983, 162p

ORDER FROM: NTIS PB84-136753

**13 382276**  
**GENERAL LAYOUT OF THE ELECTRICAL CALCULATION OF CONTACT LINES FOR ALTERNATING CURRENT TRACTION**

An illustration is given of a general procedure for the electrical calculation of alternating current contact lines, taking account of track earth dispersion, including the calculation of the longitudinal electromotive forces induced in adjacent parallel conductors. The application to single phase alternating current traction is also illustrated for the case of a system equipped with transformers and a system with feeders in phase opposition and autotransformers. [Italian]

Buffarini, GG **Ingegneria Ferroviaria** Vol. 28 No. 8, Aug. 1983, pp 505-514

ACKNOWLEDGMENT: British Railways

ORDER FROM: ESL

13 382277

**25 KV ELECTRICAL MULTIPLE UNIT FOR THE KOWLOON-CANTON RAILWAY (BRITISH SECTION)**

Outlines the history of the Kowloon-Canton Railway and its modernization. Describes the new rolling stock and some in-service experiences. Gives some reliability data and discusses the need for a worldwide reliability standard.

Botham, GJM McNeil, JH **Institution of Mechanical Engineers Proceedings** Vol. 197 No. 104, 1983, pp 1-11

ACKNOWLEDGMENT British Railways  
ORDER FROM: ESL

13 382278

**THE PRESENT STATUS OF CHOPPER CONTROL TECHNOLOGY**

The article reviews the change in emphasis in chopper technology since 1976. Energy savings and electromagnetic interference are the two topics which now concern design and railway administrations more than any of the other features of choppers. The GEC standard chopper circuit is described in detail, showing how each of its features arises out of a particular design consideration. Finally, some other chopper circuits are described to highlight the different compromises that various manufacturers have adopted in response to the conflicting requirements of cost and performance.

Whiting, JMW **GEC Journal for Industry** Vol 7 No. 3, Oct. 1983, pp 125-134

ACKNOWLEDGMENT: British Railways  
ORDER FROM: General Electric Company, Limited, London, England

13 382287

**VALIDATION OF RAILWAY VEHICLE LATERAL DYNAMICS MODELS**

The general form of the railway vehicle lateral dynamic predictions seems to have been proved. If wheels are coned, rails are of uniform cross-section, and suspensions are linear, then good predictions can be obtained. If wheels are not coned, and rail sections vary, but the suspension is relatively linear, as in modern vehicles, it is still possible to obtain good predictions of critical speed for flexible suspensions. The situation with "stiff" vehicles remains unproven. In each case dynamic response calculations will be only as good as the knowledge of the track input including the rolling line term. The validity of making calculations to predict critical speeds of very non-linear vehicles has not yet been convincingly demonstrated. Validation experiments for the more difficult case of time history representation suggest the possibility of correct prediction for easily comprehensible vehicles, but even this requires an enormous amount of supportive experimental work.

Gostling, RJ Cooperrider, N **Vehicle System Dynamics** Vol. 12 No. 4-5, Aug. 1983, pp 179-202

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: ESL

13 382288

**THE INFLUENCE OF WHEEL DISTORTION ON RUNNING NOISE [EINFLUSS DER RADUNWUCHT AUF DAS ROLLGERAEUSCH]**

The results of the measurements show that any noise produced by railway vehicle wheels which are out of true is inaudible. The differences recorded between imbalanced and balanced wheels were within a margin of plus or minus 1dB(A). There is therefore no justification for increasing the precision of wheel balancing operations for purely acoustical reasons [German]

Zach, A Rufenacht, K  
**Swiss Federal Railways CFF** 3.7018, June 1983, 5p, 10 Fig., 10 Tab., 10 Phot., 15 App.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Swiss Federal Railways, Bauabteilung, Hochschulstrasse 6, CH 3030 Bern, Switzerland

13 382312

**POWER SUPPLY ARCHITECTURE TO SAFEGUARD THE PASSENGER**

Safety in a metro is not just a matter of preventing collisions. Continuity of power supplies—especially for lighting and ventilation—is a vital element in preventing panic or heat exhaustion when people are trapped below ground. The power network designer must also appreciate that signalling and traction are operationally interdependent and are therefore of equal importance. The high power demands of a new metro can have a significant impact on the public supply in a city, and circuits must be carefully designed so that interruptions which may stop trains still leave vital services functioning

Delattre, D Venard, C (Regie Autonome des Transports Parisiens) **Railway Gazette International** Vol. 140 No. 1, Jan. 1984, pp 38-39, 2 Phot.

ORDER FROM: ESL

13 382313

**GINZA LINE PROTOTYPE PROMISES SAVINGS**

One of the most technically advanced metro car designs on trial at the moment is a six-car prototype transet for the Ginza line of Teito Rapid Transit Authority. The traction equipment features gate turn-off thyristors that do not need separate commutation circuits. Thanks to the use of high frequency choppers with microprocessor gate control, their size and weight has been significantly reduced and reliability improved. The first of 14 production trainsets now on order is to be commissioned in November with 26 more needed to complete re-equipment of the Ginza line.

Satoda, K (Teito Rapid Transit Authority) **Railway Gazette International** Vol. 140 No. 1, Jan. 1984, pp 40-41, 3 Fig., 1 Tab., 2 Phot.

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13 382568

**THE RETURN OF THE TROLLEY**

A growing number of cities in the U. S. and abroad are looking to the once nearly extinct trolley car, in modern guise, as the solution to deteriorating rail mass transit. The new light rail transit systems are characterized by their short trains (usually one or two cars) that permit frequent service, their smaller and cheaper stations, and the lighter construction as compared with conventional rapid transit. The systems now operating and scheduled to initiate service over coming years in the U. S. are mentioned. The potential for full automation and other technical advances in LRT are described.

**Mechanical Engineering** Vol. 106 No. 1, Jan. 1984, pp 35-39, 5 Phot

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13 382571

**PROGRESS IN RAILWAY MECHANICAL ENGINEERING 1982-1983 REPORT OF SURVEY COMMITTEE ON LOCOMOTIVES**

This report covers motive power designs that have been delivered in the survey period of September 1982 to September 1983. Data and photographs of 17 diesel electric locomotives, 4 electric locomotives, and 5 transets are presented as reported by builders, railroads, and trade journals.

Baker, PH Schulze, FW (General Electric Company)  
**American Society of Mechanical Engineers** 83-WA/RT-19, 1983, n.p

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13 382572

**PROGRESS IN RAILWAY MECHANICAL ENGINEERING: 1982-1983 REPORT OF SURVEY COMMITTEE ON PASSENGER/COMMUTER RAIL VEHICLES AND COMPONENTS**

This survey for the annual ASME report covers some of the major developments in rail passenger and commuter vehicle equipment made public in the last calendar year. It covers developments worldwide.

Fisher, FG (STV Engineers, Incorporated)  
**American Society of Mechanical Engineers** 83-WA/RT-17, 1983, n.p.

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13 382573

**ROLL DYNAMICS UNIT (RDU) TRUCK HUNTING DEMONSTRATION**

The paper describes a test program to demonstrate the capabilities of a Roll Dynamics Unit built at the Transportation Test Center. A detailed description of the test program, the RDU and test track results, and correlation with a 25 deg-of-freedom analytical truck hunting model is provided.

Punwani, SK Apslan, AV (Association of American Railroads)  
American Society of Mechanical Engineers 83-WA/RT-5, 1983, n.p

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13 382574

**DYNSIM, A SOFTWARE PACKAGE FOR COMPUTER-AIDED RAILROAD EQUIPMENT DESIGN PROJECTS**

Dynsim has been developed for railroad applications. It is targeted at car and locomotive truck and suspension systems that involve wheels, axles, motor mounts, bolsters, sideframes, and primary and secondary suspension elements. This paper describes Dynsim's principal features and presents examples of its use in one simple and one complex situation.

List, GF List, HA  
American Society of Mechanical Engineers 83-WA/RT-3, 1983, n.p.

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13 382592

**PLATFORM-VEHICLE INTERFACE OF A RAIL SYSTEM—STUMBLING BLOCK FOR THE HANDICAPPED**

This discussion of access for the handicapped and elderly to German passenger and transit cars focuses on the interface between the platform and vehicle. This interface is defined in terms of four geometric quantities. Wheelchair users have been excluded from rail transport in the municipal, regional and national systems. The situation with respect to light rail, rapid transit, commuter and intercity trains is analyzed. It is concluded, that despite major government financing, West German trolleys and trains consistently fail to create integrated platform-vehicle interfaces. Such an interface with roll-on/roll-off qualities lays the foundation for a number of derived benefits.

Leimbach, KR (Ruhr University, Bochum) **Transportation Planning and Technology** Vol. 8 No. 4, 1984, pp 267-281, 6 Fig., 11 Ref.

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13 382598

**RAILROAD WHEEL FAILURE ANALYSIS: FACTORS FOR CHANGING DESIGN, MATERIALS, AND OPERATING CONDITIONS ARE CONSIDERED**

This citation summarizes a one-page announcement of technology available for utilization. A program to improve the safety of rail transportation has resulted in the analyses of factors which lead to railroad-car wheel failures. The program was conducted for the U.S. Army Armament Research and Development Command. The results will be used to consider specific changes in material specifications and design configurations to improve wheel performance. In addition to an overview of wheel designs, materials, and failure types, the report covers two stress analyses via elastic/plastic finite-element method for three different wheel configurations. The thermal-stress analyses revealed larger variations in the rim of the curved-plate wheel than in either of the two straight-plate wheels.

Army Materiel Development and Readiness Command Oct. 1983, 1p

ORDER FROM NTIS NTN83-0763

13 382616

**TRANSIT CAR DEMONSTRATION TEST PROGRAM ON THE ROLL DYNAMICS UNIT. VOLUME I: STATE-OF-THE-ART-CAR (SOAC) CREEP FORCES AND DYNAMIC RESPONSE ON THE ROLL DYNAMICS UNIT**

This report documents two separate studies aimed at verifying and demonstrating the capabilities of the Roll Dynamics Unit (RDU), which is part of the Rail Dynamics Laboratory located at the Transportation Test Center (TTC) in Pueblo, Colorado. During testing, the RDU's potential for simulating actual track conditions was explored and results were correlated with measurements taken during in-track testing. Other efforts focused on

the RDU's use as a laboratory instrument by which selected performance parameters can be varied, and the responses of a single rail vehicle measured, under controlled conditions. Testing involved use of the Number One State-of-the-Art Car (SOAC), one of two such vehicles developed under UMTA's Urban Rail Vehicle and Systems Program (URRVS). The 90,000-pound intra-city, rapid transit vehicle, configured as an "A" Car capable of independent or two-car operation, was tested on the TTC's Transit Test Track to provide in-track data. It was then installed on the RDU for the testing described. Information on SOAC technical/historical development and URRVS program highlights are presented as background for the discussion of the results. Volume I was conducted by TTC personnel under the technical counsel of the University of Arizona and Clemson University personnel and concerned itself with rail vehicle stability. The specific objectives of Volume I were to : 1) determine test requirements for measuring the creep force characteristics of the SOAC on the RDU; 2) determine test requirements for dynamic tests of the SOAC or the RDU—these tests were intended to provide data for comparison and improvement of analytical vehicle dynamic models; and 3) develop software for estimation of the creep force characteristics of the SOAC on the RDU and to use this software to make a preliminary analysis of the RDU creep force characteristics. This work was planned as the first phase of a longer project to develop testing procedures for vehicles on the RDU, and to provide a method, using the theory of rail vehicle lateral dynamics, to extrapolate roller rig test results to behavior in the field. This report discusses the tests, test results, creep force identification processes, and preliminary comparisons of dynamic test results with theoretical results. This project demonstrated that the testing methods, creep coefficient identification technique, and dynamic theory validation approach all produced useful results. A number of specific conclusions in each area were also reached. The other study, Volume II, involved separate testing, done by TTC personnel, in such traditional performance areas of transit vehicle operation as traction, acceleration/deceleration, energy consumption, and spin/slide performance. In-track results were compared to RDU measured responses and the resulting excellent correlation demonstrated the feasibility of RDU testing.

Cooperrider, NK Law, EH Fries, RH Haque, I Arnold, G Nelson, S  
Transportation Test Center, Urban Mass Transportation Administration, (TTC-004) Final Rpt. UMTA-CO-06-0009-83-2, CR-R-82037, Aug 1982, 153p Contract CO-06-0009  
ORDER FROM: NTIS PB84-117530

13 382617

**TRANSIT CAR DEMONSTRATION TEST PROGRAM ON THE ROLL DYNAMICS UNIT. VOLUME II: DEMONSTRATION OF A TRANSIT CAR PERFORMANCE TEST ON THE ROLL DYNAMICS UNIT**

This report documents two separate studies aimed at verifying and demonstrating the capabilities of the Roll Dynamics Unit (RDU), which is part of the Rail Dynamics Laboratory located at the Transportation Test Center (TTC) in Pueblo, Colorado. During testing, the RDU's potential for simulating actual track conditions was explored and results were correlated with measurements taken during in-track testing. Other efforts focused on the RDU's use as a laboratory instrument by which selected performance parameters can be varied, and the responses of a single rail vehicle measured, under controlled conditions. Testing involved use of the Number One State-of-the-Art Car (SOAC), one of two such vehicles developed under UMTA's Urban Rail Vehicle and Systems Program (URRVS). The 90,000-pound intra-city, rapid transit vehicle, configured as an "A" Car capable of independent or two-car operation, was tested on the TTC's Transit Test Track to provide in-track data. It was then installed on the RDU for the testing described. Information on SOAC technical/historical development and URRVS program highlights are presented as background for the discussion of the results. This report, Volume II, contains the results, conclusions, and recommendations of the first performance test of a transit car on the RDU. This report is limited to performance tests. The objective is to identify advantages and disadvantages of performance testing on the rollers of the RDU as highlighted by the SOAC test. The report involved separate testing, done by TTC personnel, in such traditional performance areas of transit vehicle operation as traction, acceleration/deceleration, energy consumption, and spin/slide performance. The results of a successful performance test of a transit car on a roller unit is presented and the advantages of this method of testing is discussed. Acceleration, deceleration, spin/slide, and power consumption tests,

although of limited scope in comparison to the track tests performed on the same transit car, did show the feasibility of roller testing. It is concluded that the RDU is most suited for developmental testing of transit car systems particularly for power consumption and for cars with non-standard wheel gage. Tests should be of such scope as to justify the cost of car setup on the RDU. The following two test are recommended: 1) a power consumption study for a standard/non-standard gage transit car which investigates methods of reducing power consumption and 2) a non-standard gage full performance test. The other study, Volume I, was conducted by TTC personnel under the technical counsel of University of Arizona and Clemson University personnel and concerned itself with rail vehicle stability. Test methodology and software requirements were developed and analytical models evaluated. RDU mechanical characteristics were assessed in terms of their influence on measured vehicle responses during studies of hunting, creep forces, and forced sinusoidal responses.

Cooperrider, NK Law, EH Fries, RH Haque, I Arnold,  
G Nelson, S  
Transportation Test Center, Urban Mass Transportation  
Administration, (TTC-004) Final Rpt. UMTA-CO-06-0009-83-3, CR-  
R-82037, Feb. 1982, 63p Contract CO-06-0009  
ORDER FROM: NTIS PB84-117548

### 13 382636 IMPROVEMENT OF MATERIALS USED IN ROLLING STOCK TO REDUCE FIRE RISK

With the interconnection of the SNCF and RATP systems for providing fast services in the Ile de France (suburban services around Paris), it has become necessary for both undertakings to compare their technologies and pool their experience. This article describes the studies carried out on the behaviour of materials under fire conditions so that the smoke aspect (denseness and toxicity) can be integrated with the combustion aspect. These studies have led, for each type of material, to a dual fire-smoke classification being made which enables proper consideration to be given to the type of the rolling stock and its allocation to specific services. Apart from the laboratory tests, it is necessary for other far-reaching tests to be carried out in order to improve the behaviour of materials under fire conditions. The authors give details of the experiments furthered both in France and elsewhere (Japan, USA, Sweden,...) as well as of the halfscale tests made in the 27 cubic metre tank owned by the RATP. It seems that the steps now being taken internationally to define accurately the choice of the fire model and the general conditions for this type of test must be continued so that the results obtained can be used easily in practice. Technical collaboration between the SNCF and the RATP has produced good results and enabled both undertakings to strengthen their position in the field of fire prevention. [French]

Bousquet, G Muraire, R *Revue Generale des Chemins de Fer* Vol.  
102 Dec. 1983, pp 723-734

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

### 13 382637 ON THE LATERAL STABILITY OF A FLEXIBLE TRACK

Analytic formulae for the critical speed and frequency of an interconnected pair of wheelsets based on an asymptotic expansion in a truck geometric parameter are derived. No restriction is placed on the values of either the shear or bending stiffness; consequently, the entire structure of the stability surface is obtained. The surface is a symmetric function of the two dimensionless stiffnesses and it depends predominantly on their series combination. Expressions are obtained for the local and global extrema and their locations. The frequency varies monotonically from the wheelset kinematic frequency to the rigid truck frequency as a function of stiffness. The results are compared with numerical solutions and found to be accurate in the region of physically obtainable values of the expansion parameter.

Whitman, AM *Beton* Vol. 105 No. 2, June 1983, pp 120-125

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

### 13 382638 EFFECT OF KINEMATIC OSCILLATION OF TRACTIVE CHARACTERISTICS OF STEEL WHEEL ON RAIL

The effect of kinematic oscillation of a wheel on a rail has been experimentally investigated by using the newly redesigned and improved quarter scale IIT-GMEMD Wheel Rail Simulation Facility. It has been found that unlike the decrease of longitudinal adhesion observed in curve negotiation with a steady angle of attack, the kinematic oscillation at a small oscillation angle seems to actually increase the maximum adhesion levels that can be achieved. This implies that the wheel conicity is slightly beneficial from the point of view of the levels of adhesion that may be achieved. It has also been observed that the condition of the surface in terms of the roughness is a more significant parameter influencing degree of adhesion as compared to the influence of kinematic oscillation. Slightly higher roughness seems to increase the adhesion level achieved.

Kumar, S *ASME Journal of Engineering for Industry* Vol. 105 No.  
2, May 1983, pp 61-63

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

### 13 382640 TRACTION TESTER SIMULATES TRAIN INERTIA AND ROUTE CHARACTERISTICS

Combined testing of complete traction equipment reveals failure modes and weaknesses that cannot be predicted at the design stage. Microcomputer control enables phenomena such as wheelslip and overloading to be introduced while specific operating parameters and route data are applied. The ability to check regenerative/rheostatic braking performance against varying line voltage is particularly useful.

Shardlow, MA *Railway Gazette International* Vol. 140 No. 1, Jan.  
1984, pp 45-46

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

### 13 384572 INTERPRETATION OF TRAIN ROLLING RESISTANCE FROM FUNDAMENTAL MECHANICS

First-order expressions for the rolling resistance of freight trains on level tangent track were derived from the basic principles of physics and engineering. The average power dissipated by the suspension system was obtained from a linear model of the track train system. Hysteresis in the soil is computed using basic principles of soil mechanics. Losses due to wheel rolling friction, imposed wheel sliding, and bearings were estimated from simple engineering and considerations. Rolling resistance as would be measured in coast down or drawbar pull tests on level tangent track is found to depend strongly on the quality of the track as well as weight and speed. Empirical expressions such as the Davis formula, which have been used in the past by the railroad industry, are unable to describe train rolling resistance adequately because of the way in which they are parameterized.

Bernsteen, SA (Mellon Institute); Uher, Ra Romualdi, JP *IEEE  
Transactions on Industry Applications* Vol. IA-1 No. 5, Sept. 1983,  
pp 802-817, 25 Ref.

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

### 13 384573 HIGH SPEED TRAINS THROUGHOUT THE WORLD

This paper reviews the development of high speeds for trains throughout the world, with details of the records attained and commercial speeds worked in four countries where the 125 mile/h threshold has been reached or exceeded. Achievements on conventional track in Great Britain, France and Federal Germany are outlined and the two examples of new purpose-built lines specializing in high speed passenger traffic in Japan and France are described in detail.

Bouley, J (International Union of Railways, BD) *Institution of  
Mechanical Engineers, Proc Part B* Vol. 197 Feb. 1983, n.p., 2 Ref.

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

13 384629

**ORE. DT 153—ASBESTOS AND ITS USE IN FRICTION MATERIALS [ORE. DT 153—L'AMIANTE ET SON UTILISATION DANS MES MATERIAUX DE FROTTEMENT]**

This technical document summarizes information collected by ORE B126 Specialists Committee on asbestos and its use in railway-vehicle braking systems. Particulars are also given on the dangers of asbestos for the human body and on asbestos-concentration levels permitted in the atmosphere and at place of work. [French]

Sandholm, H

International Union of Railways ORE DT 153 (B126), Sept. 1983, 37p

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: UIC

13 384630

**STABILITY OF SLOPES AND TRACK BED [STABILITA DEI PENDII E DEL PIANO DI POSA DEL BINARIO]**

After briefly presenting the different types of soils encountered when preparing the track lay-out, the author examines the problems linked with track beds made of clayey or granulous soils, stability and protection of embankment slopes. [Italian]

Malerbi, M *Tecnica Professionale* No. 7, July 1983, pp 386-393, 21 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Collegio Ingegneri Ferroviari Italiani, Via Giolitti 34, Rome, Italy

13 384631

**NEW BOGIES FOR COACHES—SELECTION METHODS AND BEHAVIOUR OF THE MD 52 BOGIE IN SERVICE [NEUE REISEZUGWAGENDREHGESTELLE. AUSWAHLMETHODIK UND BETRIEBSVERHALTEN DES DREHGESTELLS MD 52]**

A cost-effectiveness analysis was used to select the most appropriate bogie type for the new generation of DB coaches, from the various bogie types that have already proved successful or that have recently been developed. Production costs were based on price levels indicated; maintenance costs for service life were determined by dismantling samples and fixing the corresponding timescales. [German]

Madeyski, T von *Glaser's Annalen ZEV* Vol. 107 No. 8-9, 1983, pp 253-258, 3 Tab., 5 Phot., 5 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: ESL

13 384633

**THE 120 SERIES SINGLE-PHASE A.C. LOCOMOTIVE WITH A 3-PHASE TRACTION CURRENT SYSTEM: THREE YEARS OF TRIALS ON THE DB [LOKOMOTIVE FUER EINPHASEN-WECHSELSTROM DER BAUREIHE 120 MIT DREHSTROMANTRIEBSTECHNIK. 3 JAHRE AUF DEN SCHIENE DER DEUTSCHEN BUNDESBahn]**

When developing the 120 Series locomotive, the DB and industry intended to provide the railways with a new generation of powered vehicles. The author takes stock of three years of service trials prior to mass production; he draws the lessons of experiments carried out until now and mentions future prospects for the locomotive in the operating field. [German]

Harprecht, W *Glaser's Annalen ZEV* Vol. 107 No. 8-9, 1983, pp 269-279, 19 Phot., 6 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: ESL

13 384634

**AVERAGE POWER LOCOMOTIVES WITH A 3-PHASE TRACTION CURRENT SYSTEM [LOKOMOTIVEN DER MITTLEREN LEISTUNGSKLASSE MIT DREHSTROMANTRIEBSTECHNIK]**

The first locomotive operated with the 3-phase traction technique was presented in Graz in 1971. Since then, more than 240 locotives using the BBC technology have been delivered, ordered or taken on option. Most of them have been built with standard components in the average power

category, some are diesel vehicles and others are a.c. or d.c. powered. Since 1971, the output of thyristors and power electronics has been developed. Apart from describing this development, the author presents four examples of locomotives in detail. [German]

Teich, W *Glaser's Annalen ZEV* Vol. 107 No. 8-9, 1983, pp 297-304, 2 Tab., 15 Phot., 10 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: ESL

13 384638

**ORE. QUESTION B 146—SERVICE TESTS ON BRAKE BLOCKS OF VARIOUS GRADES OF CAST IRON. FINAL CONCLUSIONS**

This report covers the results of the last phase of the work of the Specialists Committee: service tests with selected grades of cast iron blocks using the P, R and S systems. It contains the final conclusions for verifying the brake block characteristics. On the basis of this study the cast iron grade with 1.0% P and 0.5 to 0.9% C is recommended as the standard material for brake blocks.

International Union of Railways ORE B 146/RP 4, Apr. 1983, 21p, 4 Tab.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: UIC

13 384639

**ORE. QUESTION B 126—THE INFLUENCE OF WINTER CONDITIONS ON THE FUNCTIONING OF DISC BRAKES AND COMPOSITION BRAKE BLOCKS**

This report describes the results of the tests to determine the performance of disc brakes and composition brake blocks under winter conditions. The tests were carried out on the test rig at Vienna Arsenal and on the lines of the DB and the SNCF with various friction materials. On the basis of the studies made, the "standard programmes" for tests on the test rig at Vienna Arsenal were drawn up and also a number of proposals and recommendations were elaborated for improving braking under winter conditions.

International Union of Railways ORE B 126/RP 7, Apr. 1983, 77p, 11 Tab., 63 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: UIC

13 384647

**THE TEST LOOP OF THE ALL-UNION RAILWAY SCIENTIFIC RESEARCH INSTITUTE OF THE USSR IS 50 YEARS OLD**

Testing all the new railway equipment in a real operational environment before introducing it into regular operation on a system wide basis has become standard practice on the Soviet Railways. This article describes the story of setting up, back in 1932, an experimental test loop of the All-Union Railway Scientific Research Institute of the USSR Railway Ministry. With a 9000 ton train running continuously over a 6 km long looped test track this facility is in fact a time machine that compresses years of normal line operation into months of accelerated tests in real operational conditions. The scope and the nature of the tests as well as major results obtained are discussed in the article in terms of new types of locomotives, wagons and improved track structures that have been developed based on the tests carried out during the 50 years that have passed since the test loop was put into operation at the Shcherbinka station near Moscow.

Fufrianskyi, NA Pustovoi, VG *Rail International* Vol. 14 No. 10, Oct. 1983, pp 4-8, 3 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: ESL

13 384649

**THE SO-CALLED "Z2N" TRAINS, THE SNCF'S 2-TIER POWER UNITS: INTRODUCTION AND GENERAL CHARACTERISTICS; ELECTRICAL EQUIPMENT; DESIGN OF THE BODY AND LAYOUT [LES RAMES AUTOMOTRICES A DEUX NIVEAUX DE LA SNCF DITES "Z2N": INTRODUCTION ET CARACTERISTIQUES GENERALES; L'EQUIPEMENT ELECTRIQUE; LA CONCEPTION DE LA CAISSE ET LES AMENAGEMENTS]**

No Abstract. [French]

Lacote, F Petit, G Boutonnet, JC *Chemins de Fer* No. 361, July 1983, pp 143-172, 10 Tab., 10 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Assoc Francaise des Amis des Chemins de Fer, Gare de l'Est, Paris, France

13 384887

**STATIC CONVERTERS FOR ROLLING STOCK: RECENT DEVELOPMENTS AND EXPERIENCE GAINED [LES CONVERTISSEURS STATIQUES POUR MATERIEL ROULANT: EVOLUTION RECENTE ET EXPERIENCE ACQUISE]**

The authors review the new technique of auxiliary energy supply for rolling stock, developed over the last ten years, listing principal application-trolley buses, trams, metros, air-conditioned and non air-conditioned coaches, railcars, locomotives, fixed-consist trains. [French]

Belmonte, JC Bourgeois, P *Techniques CEM* No. 117, Nov. 1983, pp 10-15, 11 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD

13 384888

**OPTIMIZATION FROM THE STANDPOINT OF STRENGTH OF CONCRETE SLAB TRACKS [OPTIMIZACION DESDE EL PUNTO DE VISTA RESISTENTE DE LAS VIAS SOBRE PLACA DE HORMIGON]**

This article aims to optimize strengthwise, using a new calculation method, rail bearing elements. As part of the optimization process, it classifies these elements into two phases according to their specific nature: (a) Determination of the elastomer characteristics; (b) Determination of the track-bed and support foundation-layer characteristics. [Spanish]

Lopez Pita, A Canet, JM *AIT-Revista* No. 54, 1983, pp 6-11, 1 Tab., 3 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Asociacion de Investigacion del Transporte, Alberto Alcocer 38, Madrid, Spain

13 384894

**WHEELSLIP EXPERIMENT ON WCML**

The object of this experiment was to assess the magnitude and prevalence of slip and creep at the wheels of electric locomotives on the West Coast Main Line.

Gregory, RW Johnson, KL  
Cambridge University, England CUEDCMECH/TR-33-1983, Nov. 1981, 25p

ORDER FROM: NTIS PB84-140805

14 380220

**AUTOMATION OF MASS RAPID TRANSIT SYSTEMS**

Today, far-reaching automation of operating including the necessary safety checks as well as passenger information are important requirements for the profitable running of large urban rapid transit systems. Topical developments and the cooperation of engineering consultants in this field are described with the example of a research project dealing with this subject and undertaken by the West Berlin Transport Authority (BVG).

Nickel, BE *Railway Technical Review Special ed* 1983, pp 29-31

ACKNOWLEDGMENT: British Railways

ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

14 380824

**PROGRESS IN SAFETY [FORTSCHRITT MIT SICHERHEIT]**

Apart from the use of signalling relays on the DB, "discrete" components are used in certain areas such as linear control of train running, electronic remote control, electronic control of track release and traffic flow control. Development programs have been implemented to introduce electronics into signalling techniques. Lastly, the author defines the safety and profitability requirements resulting from the introduction of these new techniques.

Wehner, L *Oeffentliche Wirtschaft und Gemeinwirtschaft* Vol. 32 No. 2, 1983, 3p

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: Hammonia-Verlag GmbH, Postfach 620228, 2000 Hamburg 62, West Germany

14 381423

**SHARPENING THE FOCUS ON SAFETY**

The concept of safety and its definition, evaluation, and monetary value are addressed. A basic difficulty in defining safety is its dual nature, objective and subjective. System safety engineering is defined: the optimum degree of hazard elimination and/or control within the constraints of operational effectiveness, time, and cost, via specific application of management, scientific, and engineering principles throughout a system life cycle. Hazard and fault tree analysis are described as two tools available to the system safety engineer. The concepts of system safety engineering are applied to determining safety criteria for rail transportation (mainline and rapid transit) electronic control systems. The relationships of fail-safety, reliability, and redundancy are examined. The frequency-shift overlay track circuit, frequently used in rail/highway grade crossing warning systems, is used to illustrate failure modes that would represent hazards if not fail-safe. Verification of the fail-safety of electronic circuits via the FMECA (failure mode, effect, and criticality analysis) technique is outlined. The different approach required for safety validation of microprocessors (both hardware and software) is addressed.

Conference held in Dearborn, Michigan, 15-17 September 1980. Also published in HS-030 396 (IEEE-80CH1601-4; SAE-SP-90), "Convergence 80. IEEE Vehicular Technology Society Annual Conference (30th), International Conference on Transportation Electronics Proceedings," Utica, Michigan, 1980.

O'Neill, J

Institute of Electrical & Electronics Engrs, Inc, Society of Automotive Engineers, Incorporated IEEE-80CH1601-4, HS-030 447, 1980, 11p, 4 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration

ORDER FROM: Institute of Electrical & Electronics Engrs, Inc, Service Center, 445 Hoes Lane, Piscataway, New Jersey, 08854

14 381512

**SIGNALLING AND TELECOMMUNICATIONS**

Signalling, once a purely mechanical process involving muscle power and physical linkages, is now well and truly established in the computer age. Telecommunications, too, has adopted the latest technologies. The showcase on the following pages provides a varied cross-section of equipment demonstrating how railway signalling and telecommunications engineers have applied the microprocessor's ability to handle large amounts of data. Some items of more conventional equipment are also included.

*International Railway Journal* Vol. 23 No. 11, Nov. 1983, 5p

ACKNOWLEDGMENT: British Railways

ORDER FROM: Simmons-Boardman Publishing Corporation, P.O. Box 530, Bristol, Connecticut, 06010

14 381513

**THE CHALLENGE OF NEW TECHNOLOGY: SIGNALLING AND TELECOMMUNICATIONS**

Ideas which a decade ago offered merely an exciting glimpse into the future are fast becoming realities as signal engineers accept the challenge of new technology. Microprocessors and modern digital techniques have made possible a new generation of signalling systems which, whilst maintaining the highest standards of safety, offer greater reliability and significant cost savings. Current projects are generally concerned with providing railways with the most economic signalling systems appropriate for handling their type of traffic, with no relaxation of the high standards of safety previously obtained. British Rail's Solid State Interlocking (SSI) is to be installed at Leamington Spa in 1984. This is a joint development between British Rail, Westinghouse Signals and GEC General Signal.

*International Railway Journal* Vol. 23 No. 11, Nov. 1983, 3p

ACKNOWLEDGMENT: British Railways

ORDER FROM: Simmons-Boardman Publishing Corporation, P.O. Box 530, Bristol, Connecticut, 06010

14 381518

**TELECOMMUNICATIONS TECHNIQUES ON THE DB COME FACE TO FACE WITH TECHNOLOGY, PROGRESS AND TELECOMMUNICATIONS LAW [DIE FERNMELDETECHNIK BEI DER DEUTSCHEN BUNDESBahn IM SPANNUNGSFELD VON TECHNOLOGIE, FORTSCHRITT UND FERNMELDERECHT]**

Telecommunications are in the throes of technical change. The revolution is being brought about by digitalisation, integration and the development of optical fibres and will have a direct impact on the DB, in as far as systems techniques are concerned. The implications and prospects for telecommunications law will also have to be assessed.

Bidinger, A *Signal und Draht* Vol. 75 No. 6, June 1983, pp 99-104, 4 Phot., 7 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: Tetzlaff-Verlag GmbH, Havelstrasse 9, Postfach 4006, 6100 Darmstadt 1, West Germany

14 381519

**AN ELECTRONIC SIGNAL BOX ON THE DB [ELEKTRONISCHES STELLWERK DER DEUTSCHEN BUNDESBahn]**

Experimental electronic signal boxes are to undergo a series of intensive tests for two years, from 1985, with particular emphasis on maintenance and diagnostic facilities, minimisation of spare-part stocks and staff training. Safety component 1 (SEB 1), which is the basic design unit for the different versions of the system, derives from a solution applied to the hardware. At a latter date, the possibility of designing component SEB 2, according to the principle of comparison by software, will be examined. [German]

Wehner, L *Signal und Draht* Vol. 75 No. 6, June 1983, pp 104-107, 2 Phot., 2 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: Tetzlaff-Verlag GmbH, Havelstrasse 9, Postfach 4006, 6100 Darmstadt 1, West Germany

14 381520

**ORE—QUESTION A 155. USE OF ELECTRONIC COMPONENTS IN SIGNALING. REPORT NO 2. THEORETICAL BACKGROUND OF TRANSMISSION OF SAFETY INFORMATION [QUESTION A 155. UTILISATION D'ELEMENTS ELECTRONIQUES EN SIGNALISATION. RAPPORT NO. 2: BASES THEORIQUES DE LA TRANSMISSION D'INFORMATION DE SECURITE]**

This report describes the theoretical bases for the transmission of safety information using a multi-layer design model. The document is the first in a series of reports on aspects of safe data transmission. [French]

International Union of Railways ORE A 155/RP 2, Dec. 1982, 27p, 2 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: UIC

14 381524

**OPERATING CONTROL TECHNOLOGY FOR COMMUTER TRANSPORT [BETRIEBSFUEHRUNGSTECHNOLOGIEN OPNV]**

Up until now transport companies have used computer systems and media chiefly for management purposes but new independent systems are now being developed for use in the technical sphere (vehicles, installations, operating). They concern mainly traffic control systems, diagnostic systems. One project presently being developed is for a standardised modular system, that can be applied in as many transport companies as possible (BISON operation and information system for commuter transport). [German]

Kaufhold, H Reinhardt, W  
SNV Studiengesellschaft Nahverkehr DB: Dok 5932, 1983, 121p, 6 Tab., 44 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: SNV Studiengesellschaft Nahverkehr, Hamburg, West Germany

14 381534

**A COMPENSATION CONDUCTOR—AS AN ALTERNATIVE TO THE PROBLEMS OF ELECTRICAL INTERFERENCE [DER KOMPENSATIONSLEITER—EINE ALTERNATIVE ZUR LOESUNG ELEKTRISCHER BEEINFLUSSUNGSPROBLEME]**

In order to reduce interference caused by railway electrical equipment on nearby signalling and telecommunications cables, measures have been taken with regard to both vehicles and equipment to weaken harmonics. As power increases, the effects of fundamentals are correspondingly greater. To reduce the latter, it may be advisable to place a compensation cable near the catenary or near the cable suffering interference (the telecommunication line for instance). For economic reasons, it is often fitted on catenary masts. [German]

Bethge, W Dorendorf, K *Elektrische Bahnen* Vol. 81 No. 6, June 1983, pp 188-196, 3 Tab., 7 Phot., 7 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: ESL

14 381539

**CONTROL PANELS VERSUS VIDEO DISPLAY UNITS**

The paper poses the question "Panels" or "Video Display Units" and, in an endeavour to enable listener or reader to come to his own solution, the Author describes these two modes of system control, providing details of both the advantages and disadvantages of each. He discusses such items as original cost, together with maintenance and running costs. The cost of making alterations is also included and because the use of Video Display Units is relatively new, some possible variations of system control are elaborated. At the end there is still an unresolved conflict, but the author offers a possible best solution.

Wilson, WGJ  
Institution of Railway Signal Engineers Oct. 1983, n.p., 8 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Institution of Railway Signal Engineers, 1 Ashbourne Close, London W5, England

14 381542

**RAILWAYS: TECHNOLOGY**

Inter-city, urban mass transit and freight railways have all benefited in recent years from major developments in track technology and electronic signalling systems.

*Engineering* Vol. 223 No. 8, Aug. 1983, 6p, 7 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: ESL

14 382262

**LOCOMOTIVE CLASS 120-INTERFERENCE INVESTIGATIONS RELATIVE TO TELECOMMUNICATION AND TRAIN PROTECTION INSTALLATIONS [DIE LOKOMOTIVBAUREIHE 120-BEEINFLUSSUNGSUNTERSUCHUNGEN BEZUEGLICH DER FERNMELDE-UND SICHERUNGSANLAGEN]**

The four three-phase current traction motors of the locomotive class 120 with 5.6 M nominal rating are fed by a dc voltage intermediate circuit. This circuit generates harmonics. The interference on telecommunication and signalling installations has been measured with different loads. Due to the measuring results the converter regulation has been changed; it has been necessary to install an interference current filter at first a test pattern, which has been prepared for another locomotive class, has been used. Based on the measurements, a filter version proven for series production could be derived from this pattern. [German]

Bethge, W (Bundesbahn-Zentralamt, Munich, West Germany)  
*Elektrische Bahnen* Vol. 81 No. 7, July 1983, 4p, 10 Ref.

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

14 382271

**THE DEVELOPMENT OF OPTICAL COMMUNICATION**

Despite recent progress, optical fibre transmission systems remain primitive in comparison with, say, microwaves. This general overview of optical fibre and optoelectronics development looks to the future when the full potential of the medium has been developed.

*Gambling, WA Electronics and Power* Vol. 29 No. 11-12, Nov. 1983, pp 777-780

ACKNOWLEDGMENT: British Railways  
ORDER FROM: Institution of Electrical Engineers, Savoy Place, London WC2R 0BL, England

14 382272

**GLASS FIBRE IN THE NETWORK**

Glass fibre is now established as the best transmission medium for high data rate, long-haul communication systems. The technology is maturing to the point where fibre optics is fast becoming the cost effective solution for all data transmission needs. An all fibre optics communications network is now a real possibility.

Davis, R *Systems Technology* No. 37, Oct. 1983, pp 42-47

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

14 382273

**AUTOMATION IN URBAN RAIL-BASED TRANSIT SYSTEMS**

These last few years have seen a resurgence of interest in the mass-transit concept, characterised by the building and extension of various existing ones, the Paris system being a typical case in point. As a result of technological progress, automation has developed in a number of areas where it represents the only option open. After stating the objectives of automation, the authors explain the different scopes of application, using the Paris Metro as example. There follows a review of the automation processes, with special emphasis on the development pattern noted over the last few years. Lastly, the authors examine a number of technical and human problems posed by automation.

Perrin, J-P Beuchard, P *Revue Generale des Chemins de Fer* Vol. 102 Oct. 1983, pp 646-654

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL



14 382279

## AUTOMATIC DRIVING AND TRAIN CONTROL

The authors describe the various levels of automation currently in use and the safety principles on which they are based. In addition to safety, these systems must significantly improve the quality and efficiency of the transport system in terms of availability, reliability and maintainability. As well as being adaptable to suit various operating environments, they must be designed to keep pace with technological progress over the lifespan of a system generation. Current fields of research and future trends are also discussed.

This article originally appeared in French as MTRL. 39584 in the July 1983 issue of this Review.

Hennebert, C Ficheur, M *French Railway Review* Vol. 1 No. 5, Oct. 1983, pp 443-446

ACKNOWLEDGMENT: British Railways  
ORDER FROM: North Oxford Academic Publishing Limited, 242 Banbury Road, Oxford OX2 7DR, England

14 382280

## NEW TRAIN-BORNE EQUIPMENT FOR AUTOMATIC TRAIN RUNNING CONTROL [NEUE FAHRZEUGGERAETE FUER DIE ZUGBEEINFLUSSUNG]

Prototypes of train-borne equipment for continuous automatic train-running control (LZB) on the DB have been designed incorporating micro-computer technology and adapted for use as part of a radio LZB system. Apart from LZB lines, they are at present used as elements of an intermittent automatic train-running control system, "Indusi", and possibly later will be used as part of a large capacity data transmission system (PDS). The new device for monitoring the braking distance, PWU 80, is designed on the same technical basis; it has however a much smaller number of components. [German]

Kollmannsberger, F *Eisenbahningenieur* Vol. 34 No. 10, Oct. 1983, pp 527-535, 7 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

14 382286

## THE FIRST FULLY-ELECTRONIC SIGNAL BOX FOR SHORT-DISTANCE TRAFFIC [ERSTES VOLLELEKTRONISCHES STELLWERK FUER NAHVERKEHRSBAHNEN]

Signal box technology has developed through mechanical, electromechanical and relay phases to reach its high-point in the latter which is able to meet all specifications. However the fully-electronic signal box may prove to be more economical in the long term if the same safety levels can be guaranteed. Siemens and the Berlin Transport Company have jointly developed a new generation signal box together with the requisite software. The hardware and software are now being tested in operational service. [German]

Wuttke, G Zillner, A *Nahverkehr* Vol. 1 No. 4, 1983, pp 34-42

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Nahverkehr, Duesseldorf, West Germany

14 382310

## DEFINING LIMITS TO METRO AUTOMATION

Data processing equipment can now take logical decisions on the same pattern as the human brain, but man's ability to take creative decisions means that he will always have a role to play in urban railways. It is clearly well understood that automation improves operating safety and service quality. Whereas automation was introduced on West Germany's urban rail network primarily to save staff costs, today it is increasingly being used to free staff from routine technical duties. This allows more time for personal contact with passengers, while decisions which are too complex to be programmed can be handled under conditions of minimum stress.

Pierick, K (Technical University of Braunschweig, West Germany)  
*Railway Gazette International* Vol. 140 No. 1, Jan. 1984, pp 31-34, 2 Fig., 4 Phot., 8 Ref.

ORDER FROM: ESL

14 382320

## LINE 3 AND 4 SEOUL IN THE FOREFRONT OF METRO TECHNOLOGY

Cab signalling and speed supervision will ensure safety on the third major phase of the Seoul Subway, consisting of two north-south lines totalling 57 km. Chopper-controlled trains are being built by Daewoo under subcontract to GEC of Britain, and GEC also has overall responsibility for ensuring technical compatibility with electric power and S&T equipment supplied by Welco and Wabco from the USA. Mean summer temperatures reach 32 deg C, so trains and underground stations must be air-conditioned.

*Railway Gazette International* Vol. 140 No. 2, Feb. 1984, pp 109-111, 3 Phot.

ORDER FROM: ESL

14 382628

## LOGICALLY OPERATING ROUTE PROGRAMMER

The logically operating route programmer is a system which automatically sets up routes from a signal box, as the train approaches, in a sequence previously selected by the signalman by means of an alphanumeric keyboard. The routes programmed in this way are shown on a visual display unit as they are fed in. Routes can be fed in singly or by groups of successive routes so that, by one operation, a train can be worked through the whole zone controlled from the signal box. The signalman always has full control over the programmed sequence which can be altered by means of the keyboard in the light of prevailing circumstances. A route fed in is automatically set up when a train requests right of way through the zone controlled from the signal box and this generally happens when the train is in the approach section. [French]

Auclair, JP *Revue Generale des Chemins de Fer* Vol. 102 Dec. 1983, pp 735-738

ACKNOWLEDGMENT: British Railways  
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14 382629

## CURRENT SUPPLY TO SNCF SIGNALLING EQUIPMENT

This article describes the measures taken by the SNCF for supplying electric current to signalling equipment. To ensure that the current supply is adequate the equipment must function 24 hours a day the solutions adopted are always based on "redundancies". Furthermore, depending on the type of traffic, the equipment provided is sophisticated to a greater or lesser degree and consequently cheaper or more expensive to ensure that the best cost/performance ratio is obtained. The most recent equipment installed is therefore more often than not connected to a French Electricity Board local circuit and batteries are provided for emergency supply. [French]

Savarzeix, R *Revue Generale des Chemins de Fer* Vol. 102 Dec. 1983, pp 757-761

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

14 382630

## SECURITY AND PROBABILITY IN RAILWAY SIGNALLING

To ensure that a system is safe in spite of the failure of components, it is built on the fail-safe principle. Probability calculations do not allow this principle to be abandoned for they can only deal sufficiently accurately with part aspects. Probability can also easily lead to over-dimensioning and hence to un-economical solutions. It also puts high demands on manufacture and maintenance; probability calculations are applicable in cases where random and independent events coincide. [German]

Schwier, W *Eisenbahntechnische Rundschau* Vol. 32 No. 11, Nov. 1983, pp 731-736

ACKNOWLEDGMENT: British Railways  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

14 382631

**PROBLEMS AND FINDINGS IN PERFORMING A SAFETY TEST**

The idea of equipping railway signalling cabins with electronics has long been in the minds of engineers. It was conceived when it was realized that electronic elements could fully take over the functions of mechanical contacts. However, until the mid-1970's the electronics then available could not complete economically with the relay in signal cabins, and it was only with the introduction of the microcomputer that electronics became really interesting here. Microcomputers for railway signalling must meet very high safety requirements so that in the event of a failure no dangerous situation can arise. In the failed condition they must therefore have an operation-stopping effect. This is ensured in the investigated safe microcomputer system by, among other things, special output signal converters which allow the signals to pass only if two independent microcomputers processing them are in full agreement. In the event of a fault, a comparator device stops the processing cycle so that the converter outputs become dead. The operation-stopping side is linked to this condition. [German]

Brandl, H *Eisenbahntechnische Rundschau* Vol. 32 No. 11, Nov. 1983, pp 737-747

ACKNOWLEDGMENT: British Railways

ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

14 384575

**ADL-NET: AN OPTICAL TRANSMISSION SYSTEM FOR RAILWAYS**

A train traffic control system for the Kobe city Subway was installed. The main feature of this system is the optical ADL-Net (Autonomous Decentralized Loop Network), which is employed as its data transmission subsystem. In this report, ADL-Net and Kobe's system is outlined. Also, applications of optical data networks other than those in train traffic control system are presented.

Matsumaru, H Miyamoto, S *Hitachi Review* Vol. 32 No. 4, Aug. 1983, pp 175-180, 1 Ref.

ACKNOWLEDGMENT: EI

ORDER FROM: ESL

14 384601

**AUTOMATION AND CONTROL IN TRANSPORT. 2ND REVISED EDITION**

Although the author gives prominence to railway technology, some of the areas treated applies to both road and rail bound transport and some to road transport only. These areas are as follows: route capacity-laws for vehicle following (lane capacity, car-following theory, automatic vehicle systems), problems of congestion-traffic regulation (statistical aspects of car-following behaviour, traffic waves), computer aids to operation-traffic surveillance and control (split cycle and offset optimisation technique: scoot, control of cascaded vehicles), measurement of power-analogue computing (application to strings of vehicles), vehicle identification (bus electronic scanning indicator), interlocking-sequence control (control of intersections-automatic half barriers), control of acceleration and power (automatic transmissions), control of braking, steering-directional stability, some modern rapid transit lines (guided transport, recently constructed underground railways, intermediate systems, light electric vehicles-Tyne and Wear system, pneumatic-tired systems, innovative-fully automated systems), and possibilities for the future including small vehicles under computer control, intercity transport: high-speed rail, new forms of urban and intercity transport, air-cushion transport, linear induction motore, linear synchronous motors, electro-magnetic support and guidance (attraction mode), magnetic support and guidance -the repulsion (electrodynamic) system, and some unexplored possibilities. (TRRL)

Barwell, FT

Pergamon Press Limited Monograph 1983, 390p, Figs., Tabs., Photos., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 274519)

ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

14 384641

**PARIS SUBURBAN SERVICES: TV IN CAB [BANLIEUE PARISIENNE: LA TELE EN CABINE]**

This article describes a new platform monitoring system (with in-cab TV equipment) introduced to facilitate one-man driving of Z2N transits first introduced in November 1983 in revenue-earning service between Paris-Gare de Lyon and Melun (via Combs-la-Ville). [French]

Caremantrant, M *Vie du Rail* No. 1921, Dec. 1983, pp 4-6, 9 Phot., 2 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: Editions NM, 75440 Paris, France

14 384645

**ORE. DT 144 (A 159)—RAILWAY APPLICATIONS OF OPTICAL FIBRE COMMUNICATIONS. SYSTEMS INSTALLED OR IN THE COURSE OF INSTALLATION AT THE END OF 1982 [ORE. DT 144 (A 159)-UTILISATIONS FERROVIAIRES DE FIBRES OPTIQUES. SYSTEMS INSTALLES OU EN COURS D'INSTALLATION FIN 1982.]**

No Abstract. [French]

International Union of Railways ORE DT 144 (A 159), Nov. 1983, 120p, 10 Fig., 10 Tab.

ACKNOWLEDGMENT: International Union of Railways, BD

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14 384882

**THE ZNA 800—MICROPROCESSOR-CONTROLLED TRAIN IDENTIFICATION EQUIPMENT ON THE SIEG LINE [MIKROPROZESSORGESTEUERTE ZUGNUMMERNMELDEANLAGE-ZNA 800-SIEGSTRECKE]**

Since December 1982, the first microprocessor-controlled train identification system has been in operation in the DB's Koln district. It is a ZNA 800 prototype system developed by AEG Telefunken. This article describes the structure, operation and technical characteristics of the system and gives an account of the first results in service. [German]

Weber, H Wegener, K *Signal und Draht* Vol. 75 No. 10, Oct. 1983, pp 179-187, 9 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: Tetzlaff-Verlag GmbH, Havelstrasse 9, Postfach 4006, 6100 Darmstadt 1, West Germany

14 384886

**DESIGN AND DEVELOPMENT OF RATP TRAIN CONTROL CENTRES [CONCEPTION ET EVOLUTION DES PCC DE LA RATP]**

After reviewing the general objectives of the control centres operated by the RATP (Paris Transport Authority) since 1967, the author looks at metro control centres (Line 1, Line 11, other control centres, the latest developments and the present situation, RER control centers (Line A, Line B) and the new control centre planned for Line B, which will be installed in the Denfert-Rochereau station precincts. [French]

Beuchard, P *Revue Generale des Chemins de Fer* Dec. 1983, pp 739-748, 10 Phot., 1 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: ESL

15 380175

**ASSESSMENT OF LOW-COST ELEVATORS FOR NEAR-TERM APPLICATION IN TRANSIT STATIONS**

An assessment of low-cost elevators for use in existing transit stations, the supporting data for selecting the screw-column elevator for further evaluation, and evaluation and assessment of the screw elevator design and operation are presented. This information provides data to authority representatives to enable them to make informed decisions regarding application of the screw-column elevator. The assessment team investigated screw-column elevator design, construction, maintenance costs, and actual use. On-site inspections were conducted at a manufacturing plant and at elevator installations. It was determined that screw-column elevators offer a low-cost alternative for vertically moving elderly and handicapped patrons in transit stations. Low capital expense, minimum time for installation, low cost for standard site preparation, and maintenance costs make the screw-column elevator attractive.

This paper appeared in Transportation Research Record No. 908, Transit Terminal Facilities and Urban Rail Planning.

Shea, KM Whitley, M (Dynatrend, Incorporated); Mahapatra, BS (Southeastern Pennsylvania Transportation Authority); Koziol, JS (Transportation Systems Center) Transportation Research Record No. 908, 1983, pp 23-27, 1 Fig., 2 Tab., 1 Ref.

ORDER FROM: TRB Publications Off DOTL JC

15 380186

**INSPECTION AND ANALYSIS OF RAPID TRANSIT RIVER TUNNELS PHASE I. FINAL REPORT**

New York City Transit Authority has 13 rapid transit tunnels under rivers; they range in age from 45 to 75 years. Eleven were constructed by tunneling through rock and earth; one is an immersed tube; and one was constructed by the caisson method. While there is some rock tunneling, most is through silt, sand, clay or gravel. General condition and design standards vary with age. While inspections are performed in each tunnel on a regular schedule, it was deemed advisable to verify structural integrity to assure the safety of NYCTA riders. A comprehensive engineering examination was undertaken to determine whether there has been any structural impairment. This series of 8 reports is a summary of work done under Phase I, the preliminary investigations of the tunnels. Major areas of concern were areas of water intrusion; deterioration of interior concrete linings, exposed reinforcing steel or exposed metal linings; and track conditions. A video-tape photolog accompanied by permanent voice descriptions of any defects or points of interest was made at 25-ft intervals. Structural analysis of portions of selected tunnels was made to determine the stresses that exist today and whether these exceed original design parameters.

Mason and Hanger-Silas Mason Company, Incorporated, Tri-State Regional Planning Commission, New York City Transit Authority TS C-622, Oct. 1982, v.p., Figs., Tabs., Refs., 4 App. Grant IT-09-0089  
ORDER FROM: Mason and Hanger-Silas Mason Company, Incorporated, 437 Madison Avenue, New York, New York, 10022

15 380187

**GEOLOGY AND TUNNELS [LA GEOLOGIA Y LOS TUNELES]**

The article presents a few general notions on the basic problems normally encountered in underground tunnels and very briefly summarises the behaviour of different types of stonework used in these structures. [Spanish]

Arenillas, M *Revista de Obras Publicas* Vol. 3211 Mar. 1983, pp 65-72

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Escuela de Ingenieros de Caminos, Canales y Puertos, Ciudad Universitaria, Madrid 3, Spain

15 380204

**THE ROLE OF ECONOMIC ASSESSMENT IN SELECTING AMONG MASS TRANSIT CONSTRUCTION ALTERNATIVES**

This research study focuses on the relationship between alternative construction schedules and their resultant economic impact. The goal is the development of a list of recommendations leading ultimately to guidelines and standards governing the construction scheduling process. The concept examined in this report states that publicly supported construction should be carried out with the public's benefit in mind, and that this includes

scheduling as well. This report presents recommendations on scheduling practices that are based on this statement. The presentation emphasizes compatibility with existing scheduling practices and the role of the Leontief model in decision-making. In this report, a Leontief input-output model with dynamic capabilities is developed and applied to the assessment of the economic impact of mass transit construction, namely, the relationship of economic impact of mass transit and construction schedule alternatives. The model developed for this study, Core Sequential Interindustrial Model (CORSIM) has the additional feature of developing a dynamic picture, referred to as the impact chronology as opposed to the static summary provided by the regular input-output model. Chapter 2 of this report discusses computer modeling techniques; Chapter 3 develops the mathematical basis of CORSIM and illustrates its relevance to the economic impact of a construction project; Chapter 4 presents the application of CORSIM to construction scheduling; and Chapter 5 provides the conclusions and recommendations to the study.

Levine, SH  
Tufts University, Urban Mass Transportation Administration Final Rpt. UMTA-MA-11-0039-83-1, June 1983, 87p

ORDER FROM: NTIS PB83-263244

15 380206

**MARTA'S PRECAST SEGMENTAL BRIDGES—A FIRST FOR U.S. TRANSIT**

Metropolitan Atlanta Rapid Transit Authority is using the first precast segmental concrete railway structures in the U.S. for construction of elevated segments of its North and South line extensions. These double-track structures are assemblies of trapezoidal box girder superstructure units, each of which is 10 ft long, 7 ft deep, 30 1/4 ft wide and weighing 32 tons. The segments are assembled atop movable supports riding on temporary trusses which allow the sections to be winched into place and then assembled with external post-tension tendons within the box-girder void. Resulting T-section structures are 1900 and 5230 ft long, respectively. Segments were produced in one of MARTA's future parking lots and trucked to construction sites without traffic restriction.

*Railway Track and Structures* Vol. 79 No. 10, Oct. 1983, pp 20-23, 5 Phot.

ORDER FROM: ESL

15 380210

**DYNAMIC RESPONSE OF CONCRETE RAILWAY BRIDGES**

The article reviews current studies into the dynamic behaviour of railway bridges under a live load. Numerous factors influencing this behaviour are individually examined. A systematic analysis has been carried out on the additional margin to be provided for jerky stresses. For these different questions, the authors refer to studies performed by Japanese railways and the UIC Office for Research and Experiments (ORE).

Machida, F Matsuura, A *IABSE Proceedings* NP-60/83, May 1983, pp 53-68, 10 Fig., 10 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: International Assoc for Bridge & Structural Eng, ETH-Hoenggerberg, CH-8093 Zurich, Switzerland

15 380224

**EVOLUTION OF SUPERVISION AND MAINTENANCE METHODS FOR UNDERGROUND STRUCTURES OF THE PARIS TRANSPORT AUTHORITY (R.A.T.P)**

The R.A.T.P. operates and maintains an underground railway network over 262 km long. Construction of the tunnels and stations was begun towards the end of the 19th century and they vary in their design. Inspection methods have changed over the years, for both mandatory and technical reasons. The authors describe the various systems and methods used for inspection by the R.A.T.P. They then state how maintenance evolved up until 1970 and since that date, which marked the start of the RER construction and consequently resulted in many important findings being made. They consider in depth the different methods employed for routine maintenance of different parts of the underground system. They then give details of the methods adopted in recent years and underline the relationship required between inspection and maintenance work.

Dutems, C Lienart, J-M French *Railway Review* Vol. 1 No. 3, Aug. 1983, pp 261-276

ACKNOWLEDGMENT: British Railways  
ORDER FROM: North Oxford Academic Publishing Limited, 242  
Banbury Road, Oxford OX2 7DR, England

15 380239

**ELECTROLYTIC CORROSION OF UNDERGROUND STRUCTURES. SEMINAR ORGANISED BY THE BELGIAN ASSOCIATION FOR UNDERGROUND BUILDING AND DESIGN, BRUSSELS, 14 OCTOBER 1982 [LA CORROSION ELECTROLYTIQUE DES OUVRAGES ENTERRES. JOURNEE D'ETUDE DE L'ASSOCIATION BELGE DES TECHNIQUES ET DE L'URBANISME SOUTERRAINS, BRUXELLES, 14 OCTOBRE 1982]**

This seminar examined the phenomena and circumstances of corrosion, anti-corrosion measures in tunnels built with metal structures, experiments concerning the behaviour of stray currents in the RATP underground network and the Berlin and Montreal metro tunnels and a number of French experiments with measures for protection against electrolytic corrosion. [French]

*Tunnels et Ouvrages Souterrains* No. 57, Mar. 1983, pp 51-109, 10 Tab., 10 Phot., 10 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
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15 380240

**REPAIR OF UNDERGROUND STRUCTURES ON THE SNCF WITH SHOTCRETE [REPARATION DES OUVRAGES SOUTERRAINS A LA SNCF, PAR BETON PROJETE]**

This article, devoted to the use of shotcrete and its application to tunnel strengthening on the SNCF (Ners, Saint-Elme, Corbinieres tunnels), forms part of a series on concrete: French regulations concerning pre-stressed concrete, quality control of concrete, internal deterioration (alkali-aggregate reaction); consolidation of masonry using shotcrete (bridges and tunnels, buildings, historic monuments, ducts). [French]

Alias, J *Travaux* No. 577, May 1983, pp 68-75, 1 Tab., 18 Phot., 5 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Federation Nationale des Trav Publ & des Synd Aff, 6 Avenue Pierre Premier de Serbie, Paris 16e, France

15 380241

**OPTICAL GAUGING ALLOWS FASTER CHECKS ON CLEARANCES**

British Rail's Research & Development Department has successfully completed the first tests of its high-speed structure gauging vehicle; following further tests later this year, additional features will be incorporated for evaluation.

*Railway Gazette International* Vol. 139 No. 5, May 1983, 2p, 1 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: ESL DOTL JC

15 380258

**RAIL TRANSIT TAKES TO CONCRETE BOX GIRDERS**

Two projects for the Metropolitan Atlanta Rapid Transit Authority are reported to be the first concrete box girder rail structures built in the U. S. and are demonstrating that the design can be adapted to work well for rapid construction of short and medium-span bridges in urban areas.

*Engineering News-Record* Vol. 210 No. 24, June 1983, pp 26-28

ACKNOWLEDGMENT: EI  
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15 380785

**SOIL REINFORCEMENT IN SOFT GROUND TUNNELING**

A new technique of reinforcing earth masses around tunnels, known as the spiling reinforcement technique, is illustrated. The system consists of a series of radially installed reinforcing spiles spaced between 2 and 5 ft. with

an angle of approximately 30 deg to the tunnel axis. The spiles are formed by inserting 1-1.5 in. diameter rebars into the holes with subsequent grout. The principle of this system is to stabilize a weak mass by installing reinforcing elements into the in-situ mass as excavation proceeds. A reinforced mass adjacent to the opening is therefore formed. This method minimizes not only the instantaneous instability but also the permanent deformation. The system has been primarily used in reinforcing tunnels in weak rock formations and proven very successful. The application also involves reinforcing tunnels in soft grounds but in limited occasions due to the lack of proven design methodology. This report presents the results of the preliminary investigation of the spiling reinforcement system in soft ground tunneling. It includes the development of the analytical method of analysis, the major findings from the parametric study, and the development of the centrifuge model testing program. The analytical method of analysis includes the development of a computer finite element program with the generalized plane strain approach. The model testing program includes the modeling process of tunneling and spiling reinforcement, and the simulation of the excavation procedure in flight. The objective of this research is to conduct a preliminary study of the spiling reinforcement system regarding its behavior through theoretical and experimental investigations. It is hoped that the research would result in a better understanding of the soft ground tunneling reinforcement technique and the formation of a rational design approach for this technique.

Bang, S Shen, C-K

Notre Dame University, Department of Transportation Final Rpt. DOTRSPA/DMA-50/83/15, Dec. 1982, 92p, 38 Fig., 10 Tab., 15 Ref. Contract DTRS5681-C-00024  
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15 380810

**LATTICE GIRDERS OFFER ECONOMY AND PERFORMANCE FOR TUNNEL SUPPORT**

Lattice girders are gradually taking over the functions of colliery-type steel arches in Germany, Austria and Switzerland. Supporters of the New Austrian Tunneling Method (NATM) claim that this support and lining system combines reliability with economy. In the suggested innovative design and assemblies of lattice girder, rings, wire mesh and fixing devices provide first the temporary support in the tunnel and then the reinforcements of the sprayed concrete lining. The result is a cylindrical shell attached to the rock, thus combining the strength of reinforced concrete with the strength of the formation, while preventing harmful air and moisture penetration. This article discusses characteristics of lattice girders, applications in vehicular tunnels, and effects on tunnel stability.

Braun, WM *Tunnels and Tunnelling* Vol. 15 No. 5, May 1983, pp 19-21

ACKNOWLEDGMENT: EI  
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15 380811

**REHABILITATION OF THE 110 YEAR OLD BALTIMORE AND POTOMAC RAIL TUNNEL**

Water erosion is one of the main causes of tunnel deterioration and one of the most difficult to deal with in a rehabilitation program. The 110 year old Baltimore and Potomac twin track rail tunnel, on the approaches to Baltimore Station, Maryland, has been plagued with water problems for many years. Now with other problems such as deteriorating wooden ties (sleepers) and damage to the tunnel arch caused by new longer and higher freight cars, it has become a priority on the Amtrak Northeast Corridor Improvement Project, financed by the US Federal Railroad Administration. To handle this complex project three separate contracts have been written. The first, a field experiment to overcome logistic problems, the second to dewater the ground surrounding the tunnel and repair the lining, and the third to lower the invert and lay new ties and heavier continuous welded rail track.

Wallis, S *Tunnels and Tunnelling* Vol. 15 No. 5, May 1983, pp 52-54

ACKNOWLEDGMENT: EI  
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15 380812

**TUBULAR THRUST JACKING FOR UNDERGROUND ROOF CONSTRUCTION ON THE ANTWERP METRO PART 2**

The article, the second of a two-part series, discusses a method of constructing roof slabs for metro stations that minimizes interference with traffic above. It examines the problems of jacking under foundations, reduction of subsidence and water proofing of the tubes. In addition, applications of the technique to metro station construction in Antwerp are discussed.

See also Part I, TRIS 377812.

Hemerijckx, E (BSA Prentro MIVA, Belgium) *Tunnels and Tunnelling* Vol. 15 No. 6, June 1983, pp 27-30

ACKNOWLEDGMENT: EI  
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15 380813

**TWO GIANT BREASTING SHIELDS BURROW BENEATH TOKYO**

Two giant breasting shields are being used by two different construction companies to build the Second Ueno Tunnel, part of the Tohoku Shinkansen, one of Japan's National High speed Railways. The first breasting shield began work in January 1981. It is being used by the Kogyo Company for the construction of the section of the Second Ueno Tunnel from the Shitaya shaft to the Kanejibashi shaft. The Sato Kogyo shield is 12.84m in diameter. It weighs about 1200 tonnes, and is equipped with 48 thrust jacks, each with a capacity of 250 tonnes. The 12.82m Nishimatsu shield weighs approximately 1200 tonnes and has 40 thrust jacks, each with a capacity of 300 tonnes. This unit is being used by Nishimatsu for the construction of the Second Ueno Tunnel section from Kaneji-bashi shaft to Nippori shaft. Both shields are circular in cross section and constitute the largest shields ever built. To avoid problems usually associated with the starting sections of shield-driven tunnels, it was decided to use the ground freezing method for ground stabilisation. The article discusses project characteristics and design of the shields.

Stack, B *Tunnels and Tunnelling* Vol. 15 No. 6, June 1983, pp 42-44

ACKNOWLEDGMENT: EI  
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15 380815

**CONSTRUCTION OF A JOINT FOUR-TRACK TUNNEL FOR THE EXPRESS REGIONAL AND URBAN TRANSPORT SYSTEMS UNDER FRANKFURT'S ZEIL STREET [BAU DES VIERGLEISIGEN S-UND U-BAHN-GEMEINSCHAFTSTUNNELS UNTER DER FRANKFURTER ZEIL]**

No Abstract. [German]

Ventzke, E *Die Bundesbahn* Vol. 59 No. 6, 1983, pp 363-369, 10 Phot., 4 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

15 380817

**THE BRIDGE OVER THE MAIN VALLEY NEAR GEMUNDEN (MAIN) ON THE NEW HANNOVER-WURZBURG LINE. A SPEAR-HEAD IN RAILWAY BRIDGE-BUILDING TECHNOLOGY [DIE MAINTALBRUECKE BEI GEMUENDEN (MAIN) DER NEUBAUSTRECKE HANNOVER-WUERZBURG. EIN FUER DEN EISENBAHNBRUECKENBAU IN DIE ZUKUNFT WEISENDES BAUWERK]**

This article is mainly a presentation of the viaduct built as a 135 m long portico over the Main, resting on the v-shaped uprights of the structure. This is the largest span ever built in a pre-stressed concrete railway bridge. [German]

Leonhardt, F Zellner, W Noack, P *Eisenbahntechnische Rundschau* Vol. 32 No. 6, June 1983, pp 379-386, 8 Phot., 6 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

15 380818

**THE BUILDING OF VIADUCTS ON THE DB'S NEW LINES [ZUM BAU DER TALBRUECKEN FUER DIE NEUBAUSTRECKEN DER DB]**

A fairly large number of viaducts have now reached the design or construction stage on the DB's new Hannover-Wurzburg and Mannheim-Stuttgart lines. Track/bridge interaction presented some problems and because viaducts accounted for a very large share of the work to be done, engineering studies were preceded by comprehensive analyses with a view to achieving greater profitability in construction work through standardisation of bridges. [German]

Schmaus, W Marten, K *Eisenbahntechnische Rundschau* Vol. 32 No. 6, June 1983, pp 387-399, 18 Phot., 7 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

15 380819

**MODERN METHODS OF TUNNEL CONSTRUCTION [DIE BAUVERFAHREN DES MODERNEN VERKEHRSTUNNELBAUS]**

Since the mid '50ies, the increasing number of problems encountered during tunnel construction have acted as a powerful stimulus in the development of new building techniques and of appropriate equipment. The article presents basic designs on a comparative basis; it is limited to the methods used for the construction of railway tunnels. [German]

Beckmann, U Simons, H *Eisenbahntechnische Rundschau* Vol. 32 No. 6, June 1983, pp 401-409, 9 Phot., 7 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

15 380820

**THE LIGHT RAIL METRO IN ANTWERP: UNDERGROUND TUNNEL BUILDING BY MEANS OF HORIZONTAL TUBE SINKING [LE PRE-METRO A ANVERS: LA CONSTRUCTION SOUTERRAINE DES OUVRAGES PAR FONCAGE HORIZONTAL DE TUBES]**

Traffic congestion problems and decision to build a light rail metro system. Building methods: principles of the tube sinking method; application away from the foundations of houses and under foundations; land settlement calculations. [French]

Wittemans, A Hemerijckx, E *Tunnels et Ouvrages Souterrains* No. 57, May 1983, pp 122-132, 1 Fig., 16 Phot., 1 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: ESL

15 380830

**ELASTIC CONSOLIDATION AROUND A LINED CIRCULAR TUNNEL**

The analysis of the interaction between a thin, circular, elastic tunnel lining and the surrounding saturated, elastic soil has been presented. The loading on the lining is due to the removal of material from within the tunnel and the response of the lining is dependent on time because of consolidation within the surrounding elastic soil. A parametric study has been carried out to investigate the effects of the elastic properties of both the lining and the soil, the thickness of the lining, and the magnitude of the initial stress state in the soil upon the behaviour of the lining. It has been found that typically the maximum hoop thrust in the lining is increased only by about 10 per cent due to consolidation, but the maximum bending moment can be increased by as much as 100 per cent (A). (TRRL)

Carter, JP Booker, JR  
Sydney University, Australia Res Rpt. No. 426, Nov. 1982, 47p, 26 Fig., 2 Tab., 4 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 266479), Australian Road Research Board  
ORDER FROM: Sydney University, Australia, School of Civil and Mining Engineering, Sydney, New South Wales, Australia

15 380831

**THE ANALYSIS OF DEFORMATIONS CAUSED BY LOADING APPLIED TO THE WALLS OF A CIRCULAR TUNNEL**

An analytical solution to the problem of a load applied to a portion of the wall of a circular tunnel installed deep in a homogeneous isotropic material has been found. The solution is obtained by taking a Fourier transform, in the axial direction, of the field quantities and then representing these as a Fourier series in the polar angle. The solution has been used to analyse the problem of uniform normal loading applied over rectangular patches of the tunnel wall. An indication of how the solution can be applied to the tunnel jacking problem is given. (Author/TRRL)

Booker, JR Carter, JP

Sydney University, Australia Res Rpt. No. 435, Feb. 1983, 23p, 6 Fig., 4 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 266483), Australian Road Research Board

ORDER FROM: Sydney University, Australia, School of Civil and Mining Engineering, Sydney, New South Wales, Australia

15 380839

**GROUND FREEZING TECHNOLOGY ADVANCES WITH SPEED**

Methods are described for the development of possible applications and predictability of ground freezing technology. A tendency to study only its short term cost compared to grouting neglects the possible benefits of improved control of ground stabilisation for safer working conditions. For such applications the ground freezing system must be designed just as in other civil engineering construction projects. As computer simulation and similar techniques are still in the early stages of development, correct ground freezing procedures still generally depend on experience. The article presents brief descriptions of a number of worldwide ground freezing projects. Of the many factors to be determined by site investigation, groundwater flow is important as it may distort ice-wall growth or prevent its formation. As force interactions within the frozen soil structure are complex several methods of analysis have been adapted particularly the finite element method now widely used. (TRRL)

Jones, MB *Tunnels and Tunnelling* Vol. 14 No. 11, Nov. 1983, pp 31-35, 2 Fig., 3 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 271027)

ORDER FROM: ESL

15 380840

**VARIATION IN MEASURING ROCK JOINTS FOR TUNNELLING**

The problem of reproducibility of results, due to different observers taking part in the measurement and recording of rock discontinuities, is discussed. The article gives details of an investigation carried out by the TRRL into the reproducibility of rock joint spacing and orientation. The studies were carried out in two tunnel drives in sandstone, mudstone and limestone in the Kielder aqueduct tunnels. Examples are shown of the results of scanline surveys in which six observers recorded rock joint orientation from which methods of measuring the degree of agreement between the observers are examined. Joints recorded by the observers were shown to vary by a significant amount showing the difficulty of interpretation which indicates a possible problem in the visual monitoring of tunnels or slopes. (TRRL)

Ewan, VJ West, G Temporal, J (Transport and Road Research Laboratory) *Tunnels and Tunnelling* Vol. 15 No. 4, Apr. 1983, pp 15-18, 4 Fig., 4 Tab., 15 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 271030)

ORDER FROM: ESL

15 380871

**TUNNELLED SECTIONS FOR THE BUFFALO METRO**

The article describes the design, layout and construction of the first mainly underground light-rail transit system being built in New York. Construction started in 1979 on an initial 6.4 mile section of the system which will employ steel-wheeled rail cars and an overhead traction power supply. The section under construction will follow the alignment of Main Street at ground level along a pedestrian mall and then continue in a reinforced concrete box tunnel structure constructed by cut-and-cover methods through soft ground to depths of 30-50 ft. For the remainder of the route

the line will then run in rock tunnels at depths from 60-90 ft. Details are given of tunnel excavation methods used in which fullface tunnel boring machines have been used to cut the two 16 ft internal diameter running tunnels through the rock section. Other constructions in the rock section include a double crossover and a 496 ft long storage tunnel. (TRRL)

Torpey, KW (Mott, Hay and Anderson Int) *Tunnels and Tunnelling* Vol. 14 No. 11, Nov. 1983, pp 19-22, 3 Fig., 5 Phot., 3 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 271026)

ORDER FROM: ESL

15 380884

**THE PRACTICE OF DIRECT ATTACHMENT OF RAILTRACKS ON TO VIADUCTS [L'IMPIEGO DI ATTACCHI DIRETTI DELLE ROTAIE SUI VIADOTTI]**

The direct attachment of rails (without the use of crushed stone ballast) onto tunnel or viaduct structures is increasingly practised in many countries, especially in Metro systems. This study analyses the stresses and deformations caused by temperature variations in the case of railtrack attached directly on to a viaduct. A comparison is made to conditions and behaviour when supported on ballast. (TRRL) [Italian]

Meregali, V *e Trasporti* Vol. 51 No. 496/497, Nov. 1982, pp 879-901, 25 Fig., 4 Tab., 5 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 271214)

ORDER FROM: Casa Editrice la Fiaccola, Via Ravizza 62, Milan, Italy

15 381037

**REPORT FOR 1981 AND 1982 U.S. NATIONAL COMMITTEE FOR ROCK MECHANICS**

The U.S. National Committee for Rock Mechanics (USNC/RM), a part of the Commission on Physical Sciences, Mathematics, and Resources (CPSMR), was formed within the National Research Council in 1967 to represent U.S. interests in the science and engineering of rock mechanics. The National Research Council was established by the National Academy of Sciences in 1916 to associate the broad community of science and technology with the Academy's purposes of furthering knowledge and of advising the federal government. The purposes of the U.S. National Committee for Rock Mechanics are: 1) to serve the national interests of the U.S. by recommending actions for advancing the science and engineering of rock mechanics to government, industry, and the universities; and 2) to effect appropriate participation in all activities of the International Society for Rock Mechanics (ISRM) through the National Academy of Sciences—National Academy of Engineering—National Research Council, which adheres to the ISRM on behalf of U.S. scientists, engineers, and technologists interested in rock mechanics. The committee is sponsored by federal agencies and supported by professional societies and organizations that also nominate representatives to serve on the committee. This annual report describes the work of the committee and its panels in calendar years 1981 and 1982. Both domestic and international activities of the committee are presented in this report.

National Academy of Sciences-Natl Research Council, Urban Mass Transportation Administration Summ Rpt. UMTA-DC-06-0286-83-1, 1983, 136p

ORDER FROM: NTIS PB83-119247

15 381114

**DESIGN RECOMMENDATIONS FOR CONCRETE TUNNEL LININGS—VOLUME II: SUMMARY OF RESEARCH AND PROPOSED RECOMMENDATIONS**

The report presents design recommendations for concrete tunnel linings for transportation tunnels. The recommendations developed as a result of in-depth analysis and model testing of the behavior of concrete tunnel linings. The research addressed problem areas in current design practice, and the results have provided insight into the areas of uncertainty that have led designers to gross overconservatism in tunnel lining design. The recommended procedures take into account ultimate strength behavior of reinforced and unreinforced concrete linings and provide sufficient latitude for designers to exercise judgement gained through experience and allow the flexibility required by site-specific conditions. Details of the suggested approach are based on procedures that have been accepted for years in the

design of above-ground structures, with appropriate modifications to capitalize on the benefits of ground/structure interaction.

Paul, SL Hendron, AJ Cording, EJ Sgouros, GE Saha, PK Illinois University, Urbana-Champaign, Urban Mass Transportation Administration, (DTS-77) Final Rpt. UMTA-MA-06-0100-833, DOT-TSC-UMTA-83-16, Nov. 1983, 176p, Figs., 5 Tab. Contract DOT-TSC-1504

#### 15 381437

##### THE METRO SYSTEM IN HELSINKI CENTRAL CITY AREA PROJECT

For the pre-planning of a metro system it is important to have a good knowledge of the ground conditions. If unforeseen circumstances are discovered later it is often almost impossible to change the location of stations and route alignments. The metro system in Helsinki was therefore planned with a great accuracy and with the conditions of the rock, soil, ground water and foundations of buildings thoroughly investigated. The aim of this paper is to describe this planning. Details are given of preliminary routes, type of stations, route planning and location of stations and exits, special maps used at the pre-planning work, alternative routes, comparison of alternative routes, cost and schedule. For the covering abstract of the conference see IRRD 271697.

Subsurface Space. Environment Protection, Low Cost Storage, Energy Savings. Proceedings.

Lundstroem, L (Hagconsult Ab, Stockholm, Sweden); Jaervioe, E (Pohjatutkimus Oy, Helsinki, Finland); Kaitila, K (K Kaitila Inst Tmto, Helsinki, Finland)  
Pergamon Press Limited 1980, pp 147-154, 8 Fig., 1 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 271689), National Swedish Road & Traffic Research Institute  
ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

#### 15 381438

##### THE GROWTH AND PLANNING OF USE OF SUBSURFACE SPACE UNDER LONDON, ENGLAND

The authors give a brief history of the use of underground space in London and give details of the development and construction of the amenities provided for public transport, communications, water supply, sewers and deep level air raid shelters. There is a brief description of the geology of the area and of the methods of construction used initially and the way in which they have changed and developed. Construction materials and plant are also covered. There is a description of the growth of the unplanned system and of the difficulties that arise in the planning and construction of new amenities.(a) for the covering abstract of the conference see IRRD 271697.

Subsurface Space. Environment Protection, Low Cost Storage, Energy Savings. Proceedings.

Lyons, AC (Halcrow (William, Sir) and Partners); Bubbers, BL (Mott Hay and Anderson); Mead, DR (London Transport Executive, London, England)  
Pergamon Press Limited 1980, pp 155-162, 5 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 271690), National Swedish Road & Traffic Research Institute  
ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England TRRL

#### 15 381442

##### APPLICATION OF Q-SYSTEM IN DESIGN DECISIONS CONCERNING DIMENSIONS AND APPROPRIATE SUPPORT FOR UNDERGROUND INSTALLATIONS

Recent applications of the q-system of rockmass classification are given. It is shown that four potential storage sites with different rockmass conditions may have different optimal cavern dimensions. Support costs may increase disproportionately if dimensions are chosen that are smaller or larger than the theoretical optimum of 18 to 24 metres span. The q-system is also used for mapping rockmass conditions during tunnel and cavern construction to aid in the choice of permanent support. Examples include 25 M2 and 162 M2 headrace tunnels and an underground sewage treatment plant constructed in 1 km of caverns, 16 M in span. Mapping of associated collector and outlet tunnels is also illustrated. The former is being excavated by full-face tunnel boring machines. Finally it is shown how the

q-value can give a preliminary estimate of the in situ deformation modulus and the range of likely deformations.(a) for the covering abstract of the conference see IRRD 271697.

Subsurface Space. Environment Protection, Low Cost Storage, Energy Savings. Proceedings.

Barton, N Loeset, F Lunde, J (Norwegian Geotechnical Institute, Oslo, Norway)  
Pergamon Press Limited 1980, pp 553-561, 11 Fig., 3 Tab., 6 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 271696), National Swedish Road & Traffic Research Institute  
ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

#### 15 381443

##### COMPARATIVE ANALYSIS, AND FIELDS OF APPLICATION OF VARIOUS TUNNEL LINING DESIGN CRITERIA [ESAME COMPARATIVO E CAMPI DI APPLICAZIONE DEI DIVERSI CRITERI DI PROPORZIONAMENTO DEI RIVESTIMENTI DI GALLERIE]

This article analyses the calculation criteria proposed by various authors to determine the loads acting on tunnel linings, and a comparison is made between the approximations adopted for correct technical application. An attempt is made to group the design criteria according to their homogeneity, defining their application limits in relation to geological, geometrical and operational considerations. [Italian]

Passaro, FMK Strade Vol. 85 No. 1208, May 1983, pp 281-296, 7 Fig., 1 Tab., 32 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272568)

ORDER FROM: Permanent International Association of Road Congr, Via Andreani 4, Milan, Italy

#### 15 381445

##### THE RESTORATION OF THE DETERIORATION OF CONNECTING JOINTS [DER SANIERUNG VON SCHADEN AN KOPPELSTELLEN]

The conference session discusses the repair of deterioration damage to structural joints in reinforced concrete structures. A number of repair methods are considered: (1) the pressure injection of cracks with epoxy resin systems; (2) reinforcement of connecting joint areas with steel reinforced concrete and steel ties; and (3) additional initial stress i.e. Total reinforcement of construction works. The paper briefly details such repair techniques and their application in particular circumstances. The paper was originally published in German in work session, Bridges and Civil Engineering, Saarbruecken 23-25 April, 1980.

Transport and Road Research Laboratory Library Translation, June 1983, 5p

ACKNOWLEDGMENT: TRRL (IRRD 272595)

ORDER FROM: TRRL

#### 15 381479

##### SELECTIVE CUTTING MACHINES FOR USE WITH THE NATM

High growth rates in tunnel construction are expected in the German Federal Republic due to increasing traffic volumes, the improvement in supply and disposal utilities, and the increasing obligation for environmental protection. From 1980 to 1985 some 1700 km of utility supply and disposal tunnels, and also 120 km of railway traffic tunnels, are to be constructed. A review of the circumstances which apply to conditions and requirements for tunnelling in the German Federal Republic indicates that selective cutting machines, which in contrast to full-face cutting machines, cut only parts of the working face, offer advantages of cost, adaptability and versatility. The article describes in detail the equipment employed in such tunnelling projects where excavation techniques are influenced by principles of the New Austrian Tunnelling Method (NATM). (TRRL)

Reuter, G (Underground Railway Office, Essen) Tunnels and Tunnelling Vol. 15 No. 6, June 1983, pp 77-81, 3 Fig., 4 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 272898)

ORDER FROM: ESL

15 381481

**ROCK BOLTS**

A detailed survey is presented of the equipment and methods available for control of ground movement and prevention of rock falls by bolting. The two basic types of rock bolting system, the point anchor and full column grouting, are described along with a brief mention of a third—the “combination” type. A table lists in detail the various types of rock bolts and their dimensions produced by a selection of manufacturers from the UK and Europe. Mechanical expansion anchors are discussed together with sections on resin capsules and mortar anchors. A second table gives detailed information on the types, dimensions and setting times of rock bolting capsules and grouts for various UK and European manufacturers. Other forms of ground reinforcement described are cable bolts, used for surface works to stabilise slopes and embankments, and mechanical full column anchors. The review concludes with a description of some of the testing methods and system design that can be employed. (TRRL)

Mining Magazine Vol. 149 No. 1, July 1983, v.p., 2 Tab., 6 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 272905)

ORDER FROM: ESL

15 381483

**SEALING OF ROCK TUNNELS. GROUTING AND RESULTS  
[TÆTNING AV BERGTUNNAR.  
INJEKTERINGSUTFOERANDE OCH RESULTAT]**

Water inflow in tunnels and rock chambers often causes expenditure which is very high in relation to the cost of tunnelling and reinforcement. Particularly in urban areas, the resulting lowering of the water table may cause settlement. Data have been collected in tunnels over 23 km in length. The aim has been to achieve equivalent documentation of rock conditions and grouting, both pre- and post-driving. In Gothenburg tunnels, maximum permissible inflow was 20 l/min/km. In Stockholm, it varied between 3 and 10 l/min/100 M. For all these, systematic pre-grouting was carried out. Rock conditions have been grouped into 6 classes regarding permeability. Not only joint pattern but joint frequency is decisive for water flow. When there is little variation in crack width, long grout shields can be used, while for increasing fissures and consequent water inflow anisotropy the shields must be shorter as otherwise long boreholes cross large number of fissures of varying width, resulting in incomplete sealing of finer fissures. Number of boreholes in a grout shield must be greater when the anisotropy of rock increases. Grouting may have to be done in two stages if water flow rate is high. Blasting must be accurate to prevent damage to grout shield. (TRRL) [Swedish]

Palmqvist, K

Stiftelsen Bergteknisk Forskning Monograph BEFO 66½/3, 1983, 140p, Figs., Tabs., 19 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272552), National Swedish Road & Traffic Research Institute

ORDER FROM: Stiftelsen Bergteknisk Forskning, P.O. Box 5501, Stockholm, Sweden

15 381529

**WHEEL/RAIL RESEARCH—RESISTANCE AND COMFORT IN  
TUNNELS [RAD/SCHIENE—FORSCHUNG, WIDERSTAND UND  
KOMFORT IM TUNNEL]**

This research concerns the aerodynamic effects of running trains at high speeds in tunnels. Effects vary according to train length, couplers, speeds and the tunnel cross-section. Constructive recommendations can be put forward on the basis of these findings. [German]

Kuntze, H-D

Thyssen-Henschel DB:Dok 5938, 1983, 51p, 15 Tab., 13 Phot., 9 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: Thyssen-Henschel, Kassel, West Germany

15 381576

**TUNNELLING—IMPROVED CONTRACT PRACTICES**

This report copnsiders risks in tunnel design and construction, also the methods by which the ICE Form and other contract documents allocate responsibility for risk. The importance of the Engineer's role is emphasized, as is the need for his independence to be preserved during the execution of the contract. The influence of the new Civil Engineering Standard Method of Measurement, the role of insurance and the scope and status of site

investigation for tunnelling are also considered, together with the question of means for the resolution of contractual disputes.

CBS Laboratories CIRIA-79, May 1978, 73p

ORDER FROM: NTIS PB83-251819

15 381578

**FLAT DRILLING HEAD FOR FULL-FACE TUNNELLING MACHINES**

This report covers: 1. Present State of R and D Work. The technology in the fields of full-face tunnelling machine with flat cutting head, of roadway support, and measuring technology could be developed to full operational reliability; 2. Reasons, Targets of Research. The problems encountered can be brought to solution by systematic investigation and logical development work. By analysis of measured data the working method and the behaviour of the flat drilling head during roadheading can be optimized. 3. Method, Systematic logging and evaluation of all important machine parameters, problem analyses by program of work; 4. Results, Substantial improvement of the measuring technology as well as performance improvement of the flat drilling head, compared to previous projects. To a large extent the weak-points could be eliminated. An improved alarm system for the drilling head is to be developed; and 5. Conclusions/Application Possibilities. The method enables to cut a flat i.e. vertical face with resulting improved stability. For safety reasons and for checking the operation behaviour of the drilling head a measurement-based alarm system (early-warning system) is required. [German]

Wehrmann, W Otto, H

Planning BMFT-FB-T-82-225, 1982, 180p

ORDER FROM: NTIS DE83-750291

15 381580

**PIPE JACKING: A STATE-OF-THE-ART REVIEW**

This technical note reviews pipe-jacking techniques in the UK and in those countries where it is established use. Pipe and joint design and constructional performance are compared, including allowable end thrusts on pipes, allowable deflection of the joints, choice of packing materials, and manufacturing and constructional tolerances. Because few pipe jacks have been instrumented and data obtained on frictional forces and radial loadings.

Craig, RN

Construction Industry Research & Information Assoc CIRIA-TN-112, 1983, 67p

ORDER FROM: NTIS PB83-251371

15 381581

**HEALTH AND SAFETY ASPECTS OF GROUND TREATMENT MATERIALS**

The report identifies methods and materials used for ground treatment in mining and civil engineering. It provides a guide to the potential hazards to people and the environment for professional engineer and client. Materials are used to modify ground properties, usually by injection of fluids into the ground; in all, 150 commercially used chemicals are identified Those requiring special attention because of toxicological, flammable or explosive properties are highlighted, and 25 in common use are described more fully. Hazards in the use of materials in rock bolting and ground freezing are briefly reviewed.

Skipp, BO Hall, MJ

Construction Industry Research & Information Assoc CIRIA-95, 1982, 37p

ORDER FROM: NTIS PB83-251413

15 381585

**GROUTING CONTROL BY ELECTRICAL GEOPHYSICS: FINAL REPORT OF MODEL AND PROTOTYPE STUDIES**

Changes in electrical resistivity of soil resulting from injection of grout have been measured and found to provide indications of the extent of grout penetration in both the vertical and horizontal directions. Electrodes attached to a special tube-a-manchette injection pipe above and below grout injections parts provide a means for measuring soil resistance. Measurements taken along the pipe prior to grouting are compared to those taken during and after injection to define the vertical grout movement. Measure-



ments from similar electrodes on adjacent grout pipes are used to monitor horizontal grout permeation. The technique was devised from laboratory model experiments, and preliminary tests have been conducted in the field.

Handy, RL Lamb, RO Lutenegeger, AJ  
Iowa State University, Ames, Department of Transportation Final  
Rpt. DOT-RSPA-DMA-50-83/2, Dec. 1981, 122p Contract DOT-  
RC-92012  
ORDER FROM: NTIS PB83-255695

**15 381588**  
**CONSTRUCTION OF ELLIPTIC SECTIONAL UNDERPASS BY  
NEW PIPE JACKING METHOD**

An underpass in the Omiya Railways shunting yard was built by the segmented jacking method, which was developed by Japanese National Railways in 1976. The author of this paper previously made measurements related to soil investigations, the thrust of a segment jacking, the displacement of the rail and of the formation level due to jacking, and deflections of tunnel lining caused by a train passing after the segment jacking was completed. On this paper, the author proposes a new formula to estimate the necessary jacking force of a driving machine and the value of the effective flexural ratio which is needed to design such a tunnel lining.

Takeshita, S **Railway Technical Research Inst, Quarterly Reports**  
Vol. 24 No. 1, Mar. 1983, pp 9-14

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**15 382223**  
**DESIGN RECOMMENDATIONS FOR CONCRETE TUNNEL  
LININGS—VOLUME I: RESULTS OF MODEL TESTS AND  
ANALYTICAL PARAMETER STUDIES**

This report describes model tests and analytical studies that were performed to augment background information based on experience, interviews with design engineers, and review of the literature to propose design recommendations for concrete tunnel linings. Tests of model arches that represent underground stations and circular linings that represent continuous tunnels in rock-like media are described. Ten arches, 6 ft (1.8m) diameter, were tested to investigate modes of failure and determine the effects of lining thickness, medium stiffness, lining stiffness, lining reinforcement, shear between the lining, and medium and active load shape. Tests are also described of five circular linings, 1.0 in. (25 mm) thick and 44 in. (1120 mm) diameter, in which the effects of lining reinforcement, medium stiffness, and joints in the lining are investigated. A computer based analysis is described that will simulate a concrete lining and include the nonlinear behavior due to material properties of the concrete and reinforcement and cracking of the concrete. In the analysis, the nonlinearity due to deformations can also be included. The medium around the lining can be represented by radial and tangential springs or by continuum elements, and in the latter case, a special interface element between the lining and medium may be used. This analysis was used to simulate the model tests to verify the program and the various input parameters, and then to investigate the various parameters that have a major influence on lining behavior and lining-medium interaction.

Paul, SL Hendron, AJ Sgouros, GE Saha, PK  
Illinois University, Urbana-Champaign, Urban Mass Transportation  
Administration, (DTS-77) Final Rpt. UMTA-MA-06-0100-83-1, DOT-  
TSC-UMTA-82-37, Nov. 1983, 520p, Figs., Tabs., Refs., 3  
App. Contract DOT-TSC-1504  
ORDER FROM: NTIS PB84-158039

**15 382224**  
**DESIGN RECOMMENDATIONS FOR CONCRETE TUNNEL  
LININGS—VOLUME II: SUMMARY OF RESEARCH AND  
PROPOSED RECOMMENDATIONS**

The report presents design recommendations for concrete tunnel linings for transportation tunnels. The recommendations developed as a result of in-depth analysis and model testing of the behavior of concrete tunnel linings. The research addressed problem areas in current design practice, and the results have provided insight into the areas of uncertainty that have led designers to gross overconservatism in tunnel lining design. The recommended procedures take into account ultimate strength behavior of reinforced and unreinforced concrete linings and provide sufficient latitude for designers to exercise judgement gained through experience and allow

the flexibility required by site-specific conditions. Details of the suggested approach are based on procedures that have been accepted for years in the design of above-ground structures, with appropriate modifications to capitalize on the benefits of ground/structure interaction.

Paul, SL Hendron, AJ Cording, EJ Sgouros, GE Saha, PK  
Illinois University, Urbana-Champaign, Urban Mass Transportation  
Administration, (DTS-77) Final Rpt. UMTA-MA-06-0100-833, DOT-  
TSC-UMTA-83-16, Nov. 1983, 176p, Figs., 5 Tab. Contract DOT-  
TSC-1504  
ORDER FROM: NTIS

**15 382259**  
**PREDICTION OF EARTHQUAKE MOTION FOR RAILWAY  
STRUCTURES**

This paper describes a detailed classification of ground with an emphasis placed on the response characteristics of surface layer ground. An approach for predicting surface earthquake motion based on such classification is also described. Subjects covered include ground classification based on vibration characteristics, simple assumption method for the frequency and amplification factor of first-order peak, surface acceleration, velocity and displacement, and shear strain and shear stress in the ground.

Abe, H Wakui, H Nakamura, Y **Railway Technical Research Inst,**  
**Quarterly Reports** Vol. 24 No. 2, June 1983, pp 52-57

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**15 382263**  
**RAIL CORRIDOR PIERCES TIGHT SITE**

The paper reports how below-grade route provides high-speed downtown traffic artery. A special pile-driving rig carrying an auger for predrilling and hoisting drums to handle long concrete and steel piles was developed.

**Engineering News-Record** Vol. 211 No. 12, Sept. 1983, pp 24-25

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**15 382268**  
**TUNNEL AND STATION COST METHODOLOGY: MINED  
TUNNELS**

The main objective of this study was to develop a model for estimating the cost of subway station and tunnel construction. This report describes a cost estimating methodology for subway tunnels that can be used by planners, designers, owners, and government agencies interested in evaluating a realistic range, within which the actual bid would fall, for the cost of subway tunnels. The study approach was to analyze the actual subway contractors' techniques and try to formalize their cost estimating processes into a realistic model. Extensive interviews were conducted with subway tunnel contractors and designers to identify the basic framework for estimating costs. In this report, a hierarchical cost estimating technique is developed whereby project-specific and contractor-specific factors are identified and structured, i.e., typical advance rates are developed for a variety of geological and geometrical conditions: crew sizes (by skill) for varying geological conditions and construction methods; type and size of equipment and their associated writeoff values; type of materials; contractor overhead, taxes, interest costs, etc. A database of actual equipment, labor, materials, and lump sum costs has been compiled and may be updated as changes occur.

Ramadan, MZ Parness, BM Nassar, YE  
Multisystems, Incorporated, Urban Mass Transportation  
Administration, (STS-75) Final Rpt. UMTA-MA-06-0100-83-4, DOT-  
TSC-UMTA-82-51, Oct. 1983, 200p Contract DTRS 80-C00016  
ORDER FROM: NTIS PB84-132885

**15 382311**  
**MODERN TUNNELLING TECHNIQUES TRANSFORM METRO  
CONSTRUCTION**

The high cost of tunnelling must be weighed against surface or elevated construction when a city embarks on a metro project. As the cost of tunnelling is a direct function of the rate of advance, it is of paramount importance that the method selected is properly suited to the ground through which the tunnel is to be built. The final choice can only be made

after other factors such as surface disruption are built into the equation, but today's fast tunnelling methods are competitive with cut-and-cover in dense urban areas.

Haswell, CK *Railway Gazette International* Vol. 140 No. 1, Jan. 1984, pp 34-37, 1 Fig., 5 Phot.

ORDER FROM: ESL

15 382587

#### UNDERPINNING WITH CHEMICAL GROUT

As the Pittsburgh Light Rail Transit subway was extended down a narrow downtown street, it was necessary to protect the foundations of six large buildings. The result was the largest chemical grouting job in U.S. history. A sodium-silicate-based grout was injected through almost 4 miles of grout pipe. All buildings are founded on spread footings subject to unacceptable ground movement and subsequent building settlement. Because grouted soil directly supported the buildings, rigid support walls for the cut-and-cover excavation were unnecessary. Soldier piles and lagging were installed instead. Instruments showed that there was almost no ground movement.

Parish, WCP (Pittsburgh LRT); Baker, WH Rubright, RM (Hayward Baker Company, Incorporated) *Civil Engineering* Vol. 53 No. 8, Aug. 1983, pp 44-45, 1 Fig., 1 Phot.

ORDER FROM: ESL

15 382619

#### REPORT FOR 1981 AND 1982 U.S. NATIONAL COMMITTEE ON TUNNELING TECHNOLOGY. A SUMMARY OF THE WORK CONDUCTED DURING CALENDAR YEARS 1981 AND 1982

The U.S. National Committee on Tunneling Technology, a unit of the Commission on Engineering and Technical Systems, was formed within the Nation Research Council in 1972 by the Presidents of the National Academy of Sciences and the National Academy of Engineering. It was formed in response to a request from the Chairman of the Federal Council for Science and Technology for a "U.S. focal agency to be responsible for assessment of tunneling activities, and where appropriate, for stimulation of improvements in tunneling technology." The Committee's purposes, as stated in its Constitution, are the following: 1) To serve as the national organization for stimulating advancement in the state-of-the-art of tunneling technology and in the effective use of the subsurface by promoting the coordination of activities pertaining thereto—assessment, research, development, education, training, and collection and dissemination of information; and 2) to effect appropriate participation in all activities of the International Tunneling Association (ITA) through the National Academy of Sciences-National Academy of Engineering-National Research Council, which adheres to the ITA on behalf of the scientists, engineers, and technologists of the United States interested in tunneling technology. This Biennial Report describes the work of the Committee and its Subcommittees in calendar years 1981 and 1982. A brief synopsis is given of the Workshop on Technology for the Design and construction of Deep Underground Defense Facilities, held on November 5th and 6th, 1981, in Washington, D.C. Information pertaining to the activities of the ITA is presented and a list of tunneling-related publications is included. Appendixes A through F are, respectively: Membership, 1981-1982—U.S. National Committee on Tunneling Technology; Record of the Annual Meeting, 1981; Record of the Annual Meeting, 1982; Participants, Workshop on Deep Underground Defense Facilities; Report of the ITA Annual Meeting, 1981; and Report of the ITA Annual Meeting, 1982.

National Research Council, Urban Mass Transportation Administration Biennial UMTA-DC-06-0286-83-2, 1983, 93p Contract DC-06-0286

ORDER FROM: NTIS PB84-118769

15 382624

#### FIELD EVALUATION OF ADVANCED METHODS OF GEOTECHNICAL INSTRUMENTATION FOR TRANSIT TUNNELING

The construction of new rail rapid transit systems and additions to existing systems, has greatly increased the amount of tunneling performed in the United States. Since these transit systems are generally located in urban areas, tunneling is used to minimize the impact of the construction and operation on the community. The objective of this study is to evaluate,

through the use of a field demonstration program, the feasibility, applicability, reliability, and cost effectiveness of several advanced methods of subsurface exploration and geotechnical instrumentation to produce data usable for rapid transit tunnel design and construction within the time, cost, and schedule constraints common to the industry. A test section on the Massachusetts Bay Transportation Authority Red Line Extension-Northwest in Cambridge, was selected to evaluate methods of subsurface exploration that investigate geotechnical parameters, and instrumentation used to monitor ground movements due to tunnel construction. Numerous methods of geotechnical instrumentation, including surface and building settlement points, deep settlement points, inclinometers, piezometers, and observation wells, were used to monitor ground movements and groundwater levels within the test section. The performance of the instrumentation methods are evaluated in terms of accuracy, costs, and engineering and construction advantages. In addition, predictions of stratigraphy presented in an earlier report are compared with the stratigraphy observed during tunnel construction. Advanced methods of explorations used for these predictions are evaluated.

Thompson, DE Edgers, L Mooney, JS Young, LW Wall, F Bechtel Civil and Minerals, Incorporated, Haley and Haley, Incorporated, Urban Mass Transportation Administration, (DTS-75) Final Rpt. UMTA-MA-06-0100-83-2, DOT-TSC-UMTA-82-52, Sept. 1983, 356p Contract DOT-TSC-1570  
ORDER FROM: NTIS PB84-131721

15 382641

#### DEVELOPMENTS AND TESTS OF GROUTING AND SPRAY CONCRETE METHOD

Describes various developments and tests of the concrete spray method and grouting developed for the excavation of the Seikan tunnel.

Nakahara, A Tomoda, T *Permanent Way* Vol. 25 No. 3, No. 98, Sept. 1983, pp 21-34

ACKNOWLEDGMENT: British Railways

ORDER FROM: Japan Railway Civil Engineering Association, 1-18-7 Higashiueno, Taito-ku, Tokyo 110, Japan

15 382762

#### CALCUTTA METRO: CONTRACT SECTION 16B

A description is given of contract section 16b of the Calcutta metro which covers a stretch of cut-and-cover construction directly below a rail-over-road bridge. Neither rail nor road traffic could be suspended during construction and the excavation, which is in saturated sand with a high groundwater table, had to be carried out to a far greater depth than the bridge foundations, and very close to them. The use of cranes or other tall equipment was ruled out because of headroom restrictions. Wellpoint dewatering was not favoured for fear of settlement of the bridge foundations, and extraordinary measures were therefore called for. The methods adopted for side retention were basically variations of diaphragm walling and bored piling, using tripods instead of cranes. Excavation and concreting had to be carried out below water to a large extent. This paper discusses the gradual evolution of the methods adopted in the course of solving the problems faced during construction. (Author/TRRL)

Roy, T (Calcutta Metro) *Institution of Civil Engineers, Proceedings, Pt 1* Vol. 74 Nov. 1983, pp 871-883, 8 Fig., 1 Tab., 2 phot., 2 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273572)

ORDER FROM: ESL

15 382777

#### ACTIVITY SEQUENCE SCHEDULING USING SIMULATION ON A MICROCOMPUTER

A computer program written in Pascal for implementation on a micro computer has been developed which enables the optimal scheduling of activities which are strictly ordered, to a number of competing jobs on a single project where resource constraints mean that only one activity of each type can be scheduled at any particular instant and only one activity can proceed on a job at any particular instant. The optimal schedule minimizes project cost at least completion time or minimizes project completion time at least project cost. An example involving the scheduling of activities to ten competing jobs is given. (Author/TRRL)

Conference on Computers and Engineering 1983, Sydney 31 August-2 September 1983. Preprints of Papers.

Jones, RA (New South Wales University, Australia)  
Institution of Engineers, Australia Preprint No. 83/9, 1983, pp 7-10,  
5 Fig., 1 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 266638), Australian Road  
Research Board

ORDER FROM: Institution of Engineers, Australia, 11 National  
Circuit, Barton, A.C.T. 2600, Australia

15 382803

ITALIAN EXPERIENCE WITH TUNNEL PORTALS IN  
DIFFICULT GROUND

Particular difficulties are often experienced in the excavation of the portals for large tunnels, because of geological, morphological and environmental conditions. Ground reinforcement and excavation techniques adopted in the excavation of the portals of some large Italian tunnels, already completed or under construction, are examined. Data are provided on construction methods and also the results of using the umbrella arch method of rock reinforcement in portal construction, using a system of steel rods. (TRRL)

Barisone, G Pellizza, S Pigorini, B *Tunnels and Tunnelling* Vol. 15  
No. 12, Dec. 1983, pp 13-17, 6 Fig., 2 Tab., 5 Phot., 6 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273616)  
ORDER FROM: ESL

15 382818

SPRAYED FIBROUS CONCRETE TUNNEL SUPPORT

A report is given on the use of sprayed stainless steel fibrous concrete as a tunnel support with particular reference to work on the Corsington Aqueduct project in Derbyshire. A description is given of the proposed aqueduct which, running through various ground conditions, will be generally lined with smooth faced concrete segment with an additional 2 M diameter steel pipe where it is necessary to contain the head of water pressure. Details are given of the problems encountered and the trials carried out using shotcrete fibrous concrete where this was thought a better solution. The fibrous concrete is a dry mix with water added at the nozzle of the spraygun and 25 mm stainless steel fibres introduced at the mixing stage. Alternative aggregate sizes were tried and at one stage a steel mesh. The results of flexural strength trials with varying percentages of fibre are given and other projects outlined where the method has been used, including a main surface water sewer in Derby. (TRRL)

Barfoot, J *Concrete* Vol. 17 No. 11, Nov. 1983, 2p, 6 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 273179)  
ORDER FROM: ESL

15 382820

SOME FUNDAMENTAL ASPECTS OF THE USE OF DISC  
CUTTERS IN HARD-ROCK EXCAVATION

Some important aspects of the design of rock-cutting systems remain relatively unexplored. Two areas of practical significance in this context form the subject of this paper: cutting in jointed or fissured rock, and groove deepening. A series of controlled laboratory experiments on the performance of disc cutters in jointed rock showed that the spatial and geometrical configuration of jointed rock masses needs to be taken into consideration in the design of mechanized rock-excavating systems. One series of experiments showed that, under favourable geometric conditions, the energy required to cut in a jointed rock mass is at least half that required to cut otherwise intact rock. Groove-deepening-the progressive deepening of a groove by successive passes of a cutter-is a potential operational feature with most mechanized rock-excavating systems. Laboratory experiments revealed an important fundamental cycle of events associated with disc cutters when progressively deepening a groove in intact rock. Furthermore, in contrast to pick cutting, groove deepening by discs is shown to be an efficient operation and one that should not necessarily be avoided. This can be directly attributed to increased interaction between the disc cutters as the result of an increase in magnitude of the lateral forces generated as a groove is deepened. (TRRL)

Howarth, DF (Queensland University, Australia); Roxborough, FF (New South Wales University, Australia) *Journal of S African Inst of Mining & Metallurgy* Vol. 82 No. 11, Nov. 1982, pp 309-315, 9 Fig., 2 Tab., 1 Phot., 5 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273302)  
ORDER FROM: ESL

15 382833

GROUND MOVEMENTS CAUSED BY TUNNELLING IN  
LOOSE FILL

The measurement of surface and sub-surface settlements and surface horizontal movements caused by the construction of a 3M internal diameter tunnel in loose fill material comprising mainly ash and domestic rubbish is described. The maximum ground surface settlement was 81mm recorded over the centre-line of the tunnel and the cross-sectional area of the settlement trough represented 16 per cent of the area of the tunnel face. Sub-surface settlement measurements show that compaction within the fill caused three-quarters of the total surface settlement. Maximum horizontal movements recorded were about 20mm. (Author/TRRL)

McCaul, C Dobson, C Cooper, I (Northumbrian Water Authority);  
Spencer, IM (University of Durham, Engineering eology Lab.)  
*Transport and Road Research Laboratory*, (0305-1315) SR 781, 1983,  
5p, Figs., 2 Tab., 4 Phot., 5 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273243)  
ORDER FROM: TRRL

15 384576

AUTOMATIC MEASUREMENTS OF TUNNELLED PROFILES

An automatic instrument designed for the economic measurement of the profiles or cross sections of underground constructions, such as galleries, caverns and tunnels has been developed by Amberg Measuring Technique. The AMT Profil, mounted on a tripod, is connected with a programmable desk computer, which controls the functions of the profile measuring instrument and records and transmits the measured profile shape onto the screen. The measuring principle is based on an optical-electronic system using the triangular function with a fixed base and measured angle.

Hertelendy, A (Amberg Measuring Technique Limited) *Tunnels and Tunnelling* Vol. 15 No. 9, Sept. 1983, pp 28-29

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

15 384577

TUNNEL DESIGN CONSIDERATIONS FOR THE NEW  
GERMAN HIGH-SPEED RAILWAY

The ambitious modernization program of West German Federal Railways (DB) has made notable progress despite the worldwide economic recession compelling reasons have been advanced for placing 62% of the new route in tunnels or cuttings. One of the 17 tunnels in the current construction program is the 2333m long Altengronauer Forst Tunnel, involving cooperation between Austrian and West German companies. Subjects covered include tunneling methods, rock quality considerations, ground support, tunnel lining, and others.

Braun, WM *Tunnels and Tunnelling* Vol. 15 No. 9, Sept. 1983, pp  
37-38

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

15 384586

FATIGUE CRACKING IN BRIDGES

A number of fatigue cracks that formed in welded steel bridge structures in North America are examined. Some were found to form because the fatigue strength of a detail was less than anticipated by design specifications. A number of cracks were found to develop because large initial defects were fabricated into structures because of failure to consider the importance of secondary members or attachments. However, by far the largest cause of cracking has been the result of out-of-plane distortion particularly in small web gaps. The review identifies details that should be avoided and provides a basis for preventing such cracking in the future. (Author/TRRL)

Fisher, JW (Lehigh University) *Institution of Engineers (Australia) Civ Eng Trans* Vol. CE25 No. 4, Nov. 1983, pp 223-235, 12 Fig., 1 Tab., 25 Phot., 17 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 266695), Australian Road  
Research Board

ORDER FROM: Australian Road Research Board, P.O. Box 156, Bag 4, Nunawading, Victoria 3131, Australia

15 384607

**JACK WAS ALL RIGHT TO TUNNEL UNDER GRAVESEND**

Severe deterioration of a Victorian sewer running under the town centre required its replacement and the L350000 contract was carried out in pipe jack. The section consisted of three drives of 1200 mm diameter. A spur of the same diameter was made in smoothbase segments and provided a link between two chambers. The site was close to the railway station and tunnelling was beneath houses, a car park, shops and the civic centre. Work started at the junction of the pipe jacking and tunnelling sections and progressed at four metres per 10-hour shift by hand excavation. Pressures were contained to within 200 tonnes by the injection of bentonite formulations. Hand-mining was used because of its greater flexibility and allowed a second drive to be carried on at the same time from the double thrust-pit. When this upgrade section of the tunnel was completed, the rig was turned through 180 degrees and reset and the downgrade section was driven to connect with the first tunnel. (TRRL)

Surveyor Vol. 163 No. 4775, Jan. 1984, pp 10-11, 5 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 274896)

ORDER FROM: Business Press International Limited, Surrey House, 1 Throwley Way, Sutton, Surrey SM1 4QQ, England

15 384610

**MEASUREMENT OF IN-SITU ROCK STRESSES BY OVERCORING**

The article reviews methods to determine the state of stress in rock masses which have been extensively researched and developed. Two methods of stress measurement which have met with some success in commercial application are stress relief by overcoring and hydraulic fracturing. The former method, for which apparatus and test procedures are described, is widely used and is readily available to engineers for site evaluation studies and rock mechanics programmes related to the design of underground structures. (TRRL)

Price, KW Whittle, RA Hobbs, NB (Soil Mechanics Limited)  
Tunnels and Tunnelling Vol. 16 No. 1, Jan. 1984, pp 12-14, 5 Fig., 10 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 274926)

ORDER FROM: ESL

15 384636

**THE TRACK ON UNBALASTED SLABS, APPLIED TO THE GUADALMEDINA TUNNEL IN SPAIN [LA VIA EN PLACA SIN BALASTO, APLICADA EN EL TUNEL DE GUADALMEDINA]**

The author presents the work carried out in the 800 m. long Guadalmedina tunnel on the Malaga-Fuengirola line, where the RENFE applied for the first time the slab track technique. [Spanish]

Dominguez, C *Via Libre* No. 238, Sept. 1983, pp 31-33, 2 Fig.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: Via Libre, Torre de Madrid, Princesa 1, Madrid, Spain

15 384646

**ORE. DT 126 (D 101)—BRAKING AND ACCELERATION FORCES ON BRIDGES AND INTERACTION BETWEEN TRACK AND STRUCTURE. MEASUREMENTS ON THE NAVILLY BRIDGE [ORE. DT 126 (D 101)—INFLUENCE DU DEMARRAGE ET DU FREINAGE SUR LES PONTS ET INTERACTIONS VOIES-PONTS. CAMPAGNE DE MEASURES EFFECTUEES SUR LE PONT DE NAVILLY]**

This report presents the results of measurements carried out by the SNCF during the Spring of 1977 on the bridge over the Doubs on the double-track line between Dijon and Saint-Amour. Stresses in rails were measured at one end, near the mobile support of the structure, and on the sub-grade; rail

temperature, and displacement of bridge deck were also measured. This first series of measurements on thermal track/structure interaction were aimed mainly at the development of a trial method. [French]

International Union of Railways ORE DT 126 (D 191), Sept. 1982, 18p, 3 Tab., 12 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: UIC

15 384658

**DECISION PROCEDURES IN TRANSIT STATION DESIGN**

This report addresses two primary decisions involved in station design—how to generate one or more candidate designs for a particular site and how to choose the best design from a set of such candidates. Candidate designs require the designer to consider a variety of features and specify particular values for these features. Primary questions are how early in the design process must each element be considered and which decisions depend on others made during the process. The choosing of the best design from among a set of candidates is conceptually simpler. Evaluation criteria must be specified and the various designs evaluated in terms of these criteria. It is necessary to determine weights for the various evaluation criteria so that a measure of combinations may be used to reach a final decision. Estimates of the importance of various design elements to a successful station design are given. A conceptual analysis of the station design is developed and then the results of a survey of station design professionals is presented.

McCants, DM Richards, LG Demetsky, MJ  
Virginia University, Department of Transportation, Office of the Secretary of Transportation Final Rpt. DOT-I-83-56, May 1981, 59p, 20 Fig., 17 Tab., 17 Ref.

ORDER FROM: International Air Transport Association, Technology Sharing Program, 400 7th Street, SW, Washington, D.C., 20590

15 384883

**APPLICATION OF THE NEW AUSTRIAN METHOD OF TUNNEL DIGGING, TO THE CONSTRUCTION OF S-BAHN AND UNDERGROUND RAILWAYS IN FEDERAL GERMANY [ANWENDUNG DER NEUEN OSTERREICHISCHEN TUNNELBAUWEISE BEIM U-UND S-BAHNBAU IN DER BUNDESREPUBLIK DEUTSCHLAND]**

This underground mode of construction was adopted for the development of urban and S-Bahn tunnels, especially where friable and cohesive soils were involved. The method was improved in order to prolong stability of the terrain. The author deals with questions relating to stability, surface settlement, tunnel sections, opening of enlarged sections for branch lines and stations, as well as measures for prolonging soil stability. [German]

Babendererde, S *Beton und Stahlbetonbau* Vol. 78 No. 9, 1983, pp 237-244, 8 Phot., 13 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: ESL

15 384904

**EFFECTS OF GROUND CREEP ON A LINING INSTALLED IN A CIRCULAR TUNNEL**

The analysis of the interaction between a thin, circular, elastic tunnel lining and the surrounding visco-elastic ground has been studied. In strong ground, such as rock, it is usual for the lining to be installed after the tunnel has been excavated and if the rock subsequently creeps then loads will be induced in the lining. The magnitude of these loads will depend on the creep properties of the rock, the elastic properties of the lining, the time after excavation at which the lining is installed as well as upon the initial stress state of the ground. A parametric study has been carried out to investigate these effects.

Carter, JP Booker, JR  
Sydney University, Australia R-439, Apr. 1983, 55p

ORDER FROM: NTIS PB84-132166

16 380143

**FACILITY AND EQUIPMENT NEEDS: RESOURCE PAPER**

Normally each new bus maintenance facility represents a custom-designed, custom-built project which usually does an adequate job. The relative size of bus operations does much in determining the capabilities to be incorporated in maintenance installations. Operating costs associated with pull-ins, pull-outs, and driver relief are often overlooked in site selection. Two major questions must always be answered: What fleet size is to be accommodated (now and in the future), and what types of buses will be housed? For large properties with multiple facilities, the optimum size is an important factor. The author summarizes some steps that could be taken to improve maintenance facilities and equipment: Research and visits to other shops; adoption of new building operations technologies; thorough spatial and functional planning; diligent effort on the part of the designer; analysis of future needs and adaptability to change; life-cycle costing; adequate tools and equipment; provision for preventive maintenance; adopting recommendations of bus buildings on maintenance practices and equipment needs; communication between properties; information dissemination through industry organizations.

This paper appeared in Transportation Research Board Special Report 198: Bus Maintenance Improvement; Proceedings of the Bus Maintenance Improvement Workshop, April 14-16, 1982, St. Louis, Missouri.

Tammen, CM (Minneapolis-St. Paul Metropolitan Transit Comm)  
Transportation Research Board Special Report No. 198, 1983, pp 43-45

ORDER FROM: TRB Publications Off

16 380144

**FACILITY AND EQUIPMENT NEEDS: WORKSHOP REPORT**

Examples of facility design and equipment for bus maintenance were discussed. Specific actions were suggested to assist operators in making decisions about establishing new facilities and defining equipment needs, acknowledging that there are significant differences between large and small transit operations. Crucial in controlling maintenance costs is adequate inspection. Conclusions of the workshop about the most significant research and development areas were: Methods for automatic inspection and automatic diagnostic systems; buses should now make design provision for future retrofit of sensors for automatic diagnostic systems; determination of the structural integrity of bus frames should be possible by X-ray, ultrasonics or magnetic-particle inspection; APTA should initiate competitions to encourage submission of concepts for improved tools, techniques and equipment for reducing maintenance costs; an automatic tire-inflation tester should have high priority. Some participants felt that instead of automated testing, emphasis should be placed on tools and fixtures to facilitate repair once a problem has been identified.

This paper appeared in Transportation Research Board Special Report 198: Bus Maintenance Improvement; Proceedings of the Bus Maintenance Improvement Workshop, April 14-16, 1982, St. Louis, Missouri.

Transportation Research Board Special Report No. 198, 1983, pp 45-46

ORDER FROM: TRB Publications Off

16 380237

**TECHNICAL AND ECONOMIC BASES OF TRACK RENEWAL MEASURES [DIE TECHNISCH-WIRTSCHAFTLICHE BEGRUENDUNG VON OBERBAUERHALTUNGSMASSNAHMEN]**

On the one hand, it is necessary to shed light on the technical and economic aspects of track maintenance strategy and on its long term consequences. On the other hand, it is also necessary to refine the decision elements that are specific to the track. This objective can be reached by clarifying the notion of technical necessity by creating a total assessment system of the state of the track, basing maintenance activity on economic arguments and transforming long term planning into a real maintenance strategy. [German]

Fendrich, L *Eisenbahningenieur* Vol. 34 No. 3, Mar. 1983, pp 85-96, 5 Phot., 12 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Tetzlaff-Verlag GmbH, Havelstrasse 9, Postfach 4006, 6100 Darmstadt 1, West Germany

16 380242

**MAINTENANCE OF ESCALATORS IN METROPOLITAN RAILWAYS [ESKALATORNOE HOZJAJSTVO METROPOLITENOV]**

27 types of escalators, with a total length of 95.9 km were in use in Soviet metropolitan railways in 1982. After describing the main features of various types of escalators used since 1935, the author gives details of repair methods and measures aimed at optimising maintenance and operation. [Russian]

Monfred, EV Ovcinikov, FE *Zheleznodorozhnyi Transport* No. 2, 1983, pp 34-39

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Kamkin Bookstore, 12224 Parklawn Drive, Rockville, Maryland, 20852

16 380243

**SJ DEFROSTING HALL AT ALVSJO [AVISNINGSANLAEGGNINGEN I ALVSJO]**

Coaches are defrosted by blowing warm air on underframes and frontal parts. To save energy every unit has its own equipment for defrosting. The hall has the capacity to defrost 38 motor coaches simultaneously. Every coach carries a ton of ice. Defrosting and drying of the units demand a total time of 6 hours. [Swedish]

*Svenska Jaernvaegstidningen* Vol. 70 No. 3, 1983, pp 12-15, 8 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Jaernvaeg Statstjenstemannafoerbundet, P.O. Box 5308, 102 46 Stockholm, Sweden

16 380784

**\$350M PROJECT WILL MODERNISE NEW YORK'S REPAIR SHOPS**

Decades of deferred maintenance and renewal have crippled New York's 371 km subway. A key element in NYCTA's infrastructure, now being put right under a \$8.5bn investment programme launched by the Metropolitan Transportation Authority, is modernisation of two repair shops and 13 car storage depots. Detail designs are now being proposed after consultants had completed a thorough survey of existing facilities, and developed proposals that will correct operational deficiencies as well as raising standards to an acceptable level throughout the network.

Hardie, C (London Transport International) *Railway Gazette International* Vol. 139 No. 12, Dec. 1983, pp 920-922, 3 Phot.

ORDER FROM: ESL

16 381014

**BUS GARAGE/MAINTENANCE FACILITY STUDY**

Connecticut Transit is maintaining its fleet of Hartford buses in an 8.8-acre site involving six buildings originally built for streetcars. When it was forecast that the present fleet of under 300 buses would grow to 500, a study was undertaken to establish a new facility to supplement the existing Vernon Street garage and storage area. Now the fleet is never expected to top 300 units and the steps in planning for their maintenance have led to a recommendation for a single new facility to replace the existing garage. The 24-acre sites studied are not in the central business district but in a nearby industrial area. Selection of a site included study of deadhead mileage, along with payroll costs for maintenance personnel. The site, garage an storage buildings, and necessary equipment are all detailed.

Prepared in association with Hartford Design Group and Clarence Welti Associates.

Gannett Fleming Corrdry and Carpenter, Inc Final Rpt. Nov. 1983, v.p., Figs., Tabs., 5 App. Grant UMTA-CT-29-9003

ORDER FROM: Gannett Fleming Corrdry and Carpenter, Inc, P.O. Box 1963, Harrisburg, Pennsylvania, 17105

16 381021

**AN ANALYSIS OF TOTAL SYSTEM COSTS RELATED TO BUS GARAGE AND NETWORK CONFIGURATIONS**

Until recently, very little state-of-the-art research had been conducted on developing analytical techniques to aid in planning bus garages. Within the last two years, two have been developed. Although these two techniques are structured differently, both consider the transit network as being fixed. But,

because transit networks are flexible and pullout and pullin points and route paths change, they are not actually fixed. The objective of the research presented in this report is to develop a methodology which treats both size and location of garages and the block design as dynamic. The report discusses the development of a mathematical model to locate and size garages optimally while simultaneously assigning runs to blocks. The model is tested with a small scale diagnostic problem. A case study exercise, using the northeast third of the transit system of the Southeastern Michigan Transportation Authority, is also presented. The purpose of this case study is to demonstrate the applicability of the model on an actual transit network. The overall conclusion of this study is that the proposed methodology is a viable approach for analyzing the problem of garage location and sizing when garage location and size, as well as block designs, are dynamic in nature. It is recommended that more efficient techniques be found, following the principles of network flow techniques, rather than a general purpose linear program.

Maze, TH Knasnabis, S Kutsal, M Dutta, U  
Wayne State University, Urban Mass Transportation Administration  
Res Rpt. UMTA-MI-11-0005-83-1, Jan. 1983, 100p Contract MI-11-0005

ORDER FROM: NTIS PB83-256248

**16 381516**  
**RAIL-HEAD PROFILE RESTORATION BY PLANING AND GRINDING**

Severe rail-head wear calls for removal of appreciable metal to restore a running service profile and Plasser & Theurer's rail-planing machine SBM 200 is ideal for transposing rails in curves and planing "in situ" to reclaim rails previously discarded as scrap. Furthermore the newly-introduced GWM 220 rail-grinding machine using oscillating stones is introduced for eradicating corrugations under service conditions. Accurate restoration of rail running-surfaces is ever more essential with sophisticated wheel-tread profiles as is the need to monitor for wear, also included in GWM 220 formation.

Rail Engineering International Vol. 12 No. 2, 1983, pp 58-60

ACKNOWLEDGMENT: British Railways  
ORDER FROM: Broadfields Technical Publishers Limited, Little Leighs, Chelmsford, Essex CM3 1PF, England

**16 381533**  
**ADAPTATION OF TRACK EQUIPMENT TO THE CONDITIONS OF SHORT DISTANCE PASSENGER TRAFFIC**  
[DIE ANPASSUNG VON GLEISBAUMASCHINEN AN DIE VERHAELTNISSE DER SCHIENENBAHNEN DES OEFFENTLICHEN PERSONEN-NAHVERKEHRS (OPNV)]

In railway networks, track equipment has reached a sophisticated level of technical development. As far as short distance public transport networks are concerned, equipment must be adapted to different conditions such as limited clearance, shorter radii, and special track design. In order to allow a unified design of this equipment, it would be advisable to define the main requirements with which they should comply and publish them as specifications. [German]

Schieb, A Internationales Verkehrswesen Vol. 35 No. 4, 1983, pp 286-289, 4 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Tetzlaff-Verlag GmbH, Havelstrasse 9, Postfach 4006, 6100 Darmstadt 1, West Germany

**16 381553**  
**REPORT OF RESEARCH ON RAIL CORRUGATION, JANUARY 1980 TO DECEMBER 1982. FINAL REPORT**

This report describes work into the causes and effects of short wave length corrugations of railway track. A brief report of on site measurements of the wear rate and wear profile of rails at three different locations is followed by a more detailed analysis of the observations at one site in Lichfield. The importance of white phase on the line surface is discussed, especially its effect on wear rate. It is suggested that white phase could result from frictional heating due to wheel slip. It was observed that the grinding of newly-laid rails on site before the passage of trains reduces the rate of corrugation development. Finally, after a brief report on the most recent development of laboratory simulation experiments with the disc machine, a

detailed analysis of several possible mechanisms to explain the development of rail corrugation is given.

Grassie, SL Gregory, RW Johnson, KL  
Cambridge University, England Final Rpt. CUED/C-MECH/TR-21,  
Dec. 1982, 48p

ORDER FROM: NTIS PB84-107630

**16 381870**  
**AUTOMATIC BUS DIAGNOSTIC SYSTEM AT THE NEW YORK CITY TRANSIT AUTHORITY**

The Automatic Bus Diagnostic System (ABDS) was tested and evaluated at the New York City Transit Authority in a demonstration program for the Urban Mass Transportation Administration. This paper describes the system and its operation. Specific examples are detailed. Evaluation results and future plans are discussed.

West Coast International Meeting Vancouver, British Columbia, August 8-11, 1983.

Redifer, CJ (Hamilton Test Systems, Incorporated) SAE Technical Paper Series SAE 831186, HS-035 930, 1983, 12p, 17 Fig.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration  
ORDER FROM: Society of Automotive Engineers, Incorporated, 400 Commonwealth Drive, Warrendale, Pennsylvania, 15096

**16 382227**  
**TRANSIT BUS TIRE SURVEY**

American Public Transit Association, with the assistance of Chicago Transit Authority, surveyed APTA's membership in 1978 to develop a pattern of bus industry tire procurement practices. Returns showed most transit properties lease their tires, about 13% both lease and purchase, and under 10% rely exclusively on direct purchase. Because of the complexity of tire leasing and purchasing arrangements, including the number of types and sizes available, the differences between service agreements and the factors which contribute to tire wear, it was not possible to draw conclusive cost comparisons. The report has three sections. The first describes previous studies of tire utilization. The second presents an explanation of several different tire leasing and purchasing agreements which were identified in the course of the study. The third contains some observations of use of transit operators in evaluating tire procurement procedures

American Public Transit Association, Chicago Transit Authority Dec. 1979, v.p., 3 Tab., 3 Ref., 3 App.

ORDER FROM: American Public Transit Association, 1225 Connecticut Avenue, NW, Washington, D.C., 20036

**16 382246**  
**VERSATILE DEMANDS ACCOMMODATED BY AUTOMATICALLY-CONTROLLED ROLLING-STOCK WASHING PLANT**

The paper summarizes a layout of the "Britannia" fully-automatic train washing system which comprises of five stations. Sited after an auto/manual indicator sign, they are: the pre-wet station, an acid-brush station, a neutralizer brush station, a water brushing station, and a final-rinse station.

Rail Engineering International Vol. 12 No. 1, 1983, pp 26-27

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**16 382247**  
**STATISTICAL CHARACTERISTICS OF 10M AND 20M REPRESENTATIVE VALUES OF HIGH-SPEED TRACK INSPECTION RECORD (MAYA CHART)**

The primary data obtained by the inspection of track irregularities on the high-speed inspection car in continuous analog amount represented by the waveform of the MAYA chart are presented. In addition to the basic distribution characteristics of the 10m representative value and the 20m representative value, this article deals with the result of the investigations and study conducted for the purpose of clarifying the relation between the P value and the number of B-repair points.

Sato, Y (Japanese National Railways); Hosokawa, T **Permanent Way** Vol. 25 No. 2, 1983, pp 24-31

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**16 382248**  
**TEST PRODUCTION OF TRACK RIDING QUALITY MEASURING INSTRUMENT AND BRIEF MEASUREMENTS**

A method of evaluating the track conditions to measure vibration acceleration of trains in service in addition to the track irregularities by the high-speed track inspection car is discussed. A working model of a track riding quality measuring instrument for the riding quality level is described.

Mochinaga, T (Japanese National Railways); Horikawa, Y **Permanent Way** Vol. 25 No. 2, 1983, pp 5-23

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**16 382256**  
**TEST RESULTS ON BALLASTED TRACKS LAID ON SUBGRADE OF CUTTING AND ON REINFORCED SOIL SUBGRADE ON EMBANKMENT**

To certify a new theory on deterioration of ballasted track including the subgrade, various loading tests were carried out on natural soil and reinforced soil subgrades in cut areas. Other tests were then conducted on cut-area and reinforced soil subgrades on embankments. This paper presents the results of the studies.

Uchida, M Koido, Y Ohi, S Kubo, T **Railway Technical Research Inst, Quarterly Reports** Vol. 24 No. 2, June 1983, pp 81-82

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**16 382274**  
**THE INTRODUCTION OF BRITISH RAIL'S STONEBLOWING TECHNIQUE AS AN ALTERNATIVE TO TAMPING**

This paper is intended to give a brief insight into the reasons why British Rail decided to develop a new method of track maintenance and how the process of stone blowing works. It is difficult to foresee any great improvement in operational speed of tamping machines since current models can already surface substantial amounts of track in fairly short times. It was noticed that although the track quality after tamping was very good, this deteriorated very quickly under traffic. Tamping is also relatively unsuccessful in areas where the ballast is poor, for example wet spots and on short wavelength faults such as those which occur at joints. These observations prompted British Rail into developing a new method of maintenance which produced a more permanent repair.

Johnson, DM **AREA Bulletin** No. 693, Oct. 1983, pp 329-346

ACKNOWLEDGMENT: British Railways  
ORDER FROM: AREA

**16 382285**  
**WEAR BEHAVIOUR OF POINTS LAID WITH GROOVED RAILS [VERSCHLEISSVERHALTEN VON WEICHEN AUS RILLENSCHIENEN]**

Wear of certain parts of points laid with grooved rail decreases as the metal strength and the height of the flange increase. If the flange is high, the wearing parts are subject to less surface pressure. The radius of the point on the other hand makes practically no difference. The Association of Public Transport Companies will produce recommendations for its members on the basis of these test results. [German]

Jacoby, N Baum, G **Nahverkehr** Vol. 1 No. 3, 1983, pp 42-45, 7 Phot., 4 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Nahverkehr, Duesseldorf, West Germany

**16 382294**  
**ORE. QUESTION B 55—CONDITIONS FOR NEGOTIATING TRACK TWISTS—RECOMMENDED VALUES FOR TRACK TWIST AND CANT—CALCULATION AND MEASUREMENT OF THE RELEVANT VEHICLE PARAMETERS**

The report describes an approximated model for the track/vehicle system, which guarantees safety against derailment when negotiating track twist, developed as a result of comprehensive tests, statistical analyses and theoretical investigations. The ORE B 55 system is based on the relationships found to exist between track and vehicle condition. The limits for track twist and cant necessary in order to maintain safety, give rise to recommendations for track layout and maintenance. The emphasis of the report is placed on the calculation and test procedures for the evaluation of vehicles. The calculation procedure gives the vehicle designer the opportunity to adapt his vehicle to the given track conditions. There are two methods by which a serviceable vehicle may be assessed. Diagrams and figures for the necessary input data of the calculation and test procedures complete the report.

International Union of Railways ORE B 55/RP8, Apr. 1983, 92p, 5 Tab., 37 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: UIC

**16 382301**  
**NYCTA STRIVES FOR MORE COST-EFFICIENCY; SECURES BIG MAINTENANCE SAVINGS**

The four-thousand bus fleet of New York City Transit Authority is now operating under extended lubricating oil changes monitored by a regular laboratory analysis by a contractor. Viscosity and spectrographic analysis results are gathered in a computer and exception messages concerning specific buses are transmitted to the appropriate NYCTA maintenance facility. Oil changes are now controlled by spectrochemical analysis, doubling the intervals to an average of 12,000 miles. Other changes to increase efficiency and effectiveness of NYCTA bus maintenance practices are also described.

Fullen, J **Metro** Vol. 80 No. 1, Jan. 1984, 3p, 2 Phot.

ORDER FROM: Bobit Publishing Company, 2500 Artesia Boulevard, Redondo Beach, California, 90278

**16 382302**  
**SEMTA'S ENGINE OIL MONITORING PROGRAM**

This article outlines some steps Southeastern Michigan Transportation Authority (SEMTA) has taken to improve maintenance practices for its large diesel-powered buses and smaller gasoline-engine units. Working with a research and test contractor, SEMTA determined that it needed a diesel-engine oil with a specification somewhat higher than specified by its engine builders regarding both chemistry and physical properties. The smaller engines showed markedly different oil-life characteristics which were then compensated for in the preventive maintenance program. The oil monitoring program is seen as a vital part of preventive maintenance and cost control for transit operations. It must also generate a real correlation between the lubricant and the engine in which it is used.

Snyder, R Shrauner, R (SEMTA) **Metro** Vol. 80 No. 1, Jan. 1984, 4p

ORDER FROM: Bobit Publishing Company, 2500 Artesia Boulevard, Redondo Beach, California, 90278

**16 382321**  
**OMAHA OPENS NEW BUS FACILITY—MANY INNOVATIONS ARE FEATURED**

Metro Area Transit of Omaha, NE, has opened a new bus maintenance, vehicle storage and administrative facility. The 6 1/2-acre structure includes a work area accommodating 30 buses, a rebuild shop, and storage for 234 buses and up to 35 vans and other vehicles. Other facilities include a computer room, library, customer service department, transportation offices and print shop. Much attention has been given to minimizing energy use in the facility and assuring unimpeded flow of buses through it.

**Bus Ride** Vol. 19 No. 8, Jan. 1984, pp 50-52, 6 Phot.

ORDER FROM: Friendship Publications, Incorporated, West 2627  
Providence, P.O. Box 1472, Spokane, Washington, 99210

16 382569

**THE TRACK STRUCTURE**

In an interview two officers of Koppers Company look at the track structure—rails, fastenings, ties and ballast. They have analyzed U.S. and overseas trends in staffing and in the design and economics of track structures. There is a comparison of the attributes of concrete cross ties in the U.S. and Europe. It is concluded that the track structure in the U.S. has improved dramatically in the past ten years because of improved maintenance and that this track is now performing more efficiently than that anywhere else.

Mechanical Engineering Vol. 106 No. 1, Jan. 1984, pp 44-47, 1 Phot.

ORDER FROM: ESL

16 382570

**THE DEVELOPMENT OF RAIL CORRUGATION MEASURING DEVICE**

An instrument for obtaining longitudinal rail profiles, specifically rail corrugations, and the results obtained from the instrument are described. While based on the offset from a chord, the configuration of the chord was chosen so that subsequent processing can correct for the nonuniformity of the chordal response to different wavelengths. Unlike inertial instruments, the chord-based device has no minimum speed limitations.

Corbin, JC (BRM Technologies); Lovette, PM (Southern Railway Company)  
American Society of Mechanical Engineers 83-WA/RT-16, 1983, n.p.

ORDER FROM: ESL

16 382602

**ANALYSIS OF LATERAL RAIL RESTRAINT**

This report deals with the analysis of lateral rail strength using the results of experimental investigations and a nonlinear rail response model. Part of the analysis involves the parametric study of the influence of track parameters on lateral rail restraint. These parameters include rail size, rail support characteristics, and wheel versus truck loading. Based on these results, safety limits on allowable rail restraint degradation for low speed track are presented.

Jeong, D Coltman, M  
Transportation Systems Center, Federal Railroad Administration Final Rpt. DOT-TSC-FRA-83-4, FRS/ORD-83/15, Sept. 1983, 88p

ORDER FROM: NTIS PB84-123132

16 382605

**COLD WEATHER TRANSIT TECHNOLOGY PROGRAM.  
VOLUME 16: MODELING OF ICE FRACTURE**

This report is one of a series of reports associated with the U.S. Department of Transportation Urban Mass Transportation Administration's (UMTA) Cold Weather Transit Technology (CWTT) Program that aims to develop new and more effective solutions for cold weather problems experienced by urban mass transportation systems. This report presents analytical and laboratory investigation results on mechanical techniques for removing ice from a rail, namely, the fracture of ice by scrapers and water jets. The investigations emphasize the determination of stress distributions within the ice to be removed and at the substrate-ice interface. In addition to theoretical studies of ice buckling phenomena and ice crack branching at the ice-substrate interface, three special systems were studied: ice debonding from an ideal composite rail; design of new ice scrapers; and hydroblast. The composite rail study supports work in Volume 10 which discusses composite rail designs. A hydroblast system was developed by Vought (Volume 5). The hydroblast investigation supported that effort and agreed with laboratory test data. The P-L ice scraper designs reduce significantly the force required to separate the ice from the substrate. This report contains numerous charts depicting such items as interface stress, dynamic buckling of ice strip, ice scrapers, crack branching, and deicing by hydroblast.

Lee, LHN  
Notre Dame University, Urban Mass Transportation Administration Final Rpt. UMTIN-06-0009-83-16, Nov. 1983, 170p

ORDER FROM: NTIS PB84-155399

16 382606

**COLD WEATHER TRANSIT TECHNOLOGY PROGRAM.  
VOLUME 7: TRACK SWITCH DEICING SYSTEM RESEARCH**

This report is one of a series of reports associated with the U.S. Department of Transportation Urban Mass Transportation Administration's (UMTA) Cold Weather Transit Technology (CWTT) Program that aims to develop new and more effective solutions for cold weather problems experienced by urban mass transportation systems. This report documents the research and testing of existing and newly emerging railway track switch deicing systems to determine their performance and economic characteristics. This investigative research of deicing systems used by railroads and rail transit systems was undertaken in 3 phases. Phases 1 did a literature search/survey of North American railroads and rail transit systems, European railroads and rail transit systems, and switch heater element and system suppliers in order to understand and define the track switch operational problems (PB 83-219527). Phase 2 and the bulk of this research task evaluated the performance and energy requirements for electrically powered switch heating systems. Phase 3 initiated a comparative evaluation of a high performance versus a low energy switch heater system installed at a northern railroad site (Niles, Michigan). This report states that the results indicate that current railway track switch heater systems that use mineral insulated (MI) tubular heating elements are able to provide the necessary performance to insure continued switch operations under severe cold weather conditions, and it recommends continuing switch deicing research in such areas as low energy switch heating systems, ice and snow detections systems, etc.

Lawson, SJ, Jr Barrilleaux, HP Randolph, DG  
Vought Corporation, Urban Mass Transportation Administration Final Rpt. UMTA-IN-06-0009-83-7, Nov. 1983, 152p

ORDER FROM: NTIS PB84-155407

16 382607

**COLD WEATHER TRANSIT TECHNOLOGY PROGRAM.  
VOLUME 4: INVESTIGATION OF RAIL HEATER  
RELIABILITY**

This report is one of a series of reports associated with the U.S. Department of Transportation Urban Mass Transportation Administration's (UMTA) Cold Weather Transit Technology (CWTT) Program that aims to develop new and more effective solutions for cold weather problems experienced by urban mass transportation systems. Several rail transit authorities reported that the currently used mineral insulated (MI) tubular electrical resistance heaters have high failure rates with resultant high maintenance and replacement costs. The objectives of this investigation were to determine how and why the MI tubular heaters fail and to provide recommendations for design and operational improvements that could influence their service life. This report documents the results of the investigation into the reliability of present railroad switch and third rail heaters used in deicing and snow removal applications. The investigation of the switch and third rail heater reliability was accomplished in 4 phases: Phase 1 surveyed northern rail authorities and heater manufacturers to determine the nature and extent of the reliability problem (PB 83-219527); Phase 2 investigated the operational and environmental conditions of heater installation; Phase 3 examined and tested failed heaters; and Phase 4, this report, was directed to operational testing of new heaters to replicate typical failures for examination and analysis to determine the cause and establish correlation with the failed heater failure analysis. Work accomplished and results of each phase of this investigation are discussed in Sections 2.0 through 5.0 of this report.

Payne, JN  
Vought Corporation, Urban Mass Transportation Administration Final Rpt. UMTA-IN-06-0009-83-4, Nov. 1983, 72p

ORDER FROM: NTIS PB84-155381

16 382618

**SPECIFICATION GUIDE FOR SNOW REMOVAL VEHICLES  
FOR RAIL TRANSIT SYSTEMS**

During the Winter of 1977-1978, a major snow storm shut down the Boston transit system for almost a week and the Winter of 1978-1979 produced similar snow conditions that paralyzed the Chicago transit system and disabled more than half of their rail fleet. As a result of these



disruptions and breakdowns, the Snow Belt Transit operators became increasingly aware of the need for special measures that must be taken in order to maintain rail operation during severe winter conditions. This need was highlighted at the American Public Transit Association's conference in the Spring of 1979 at which time a Snow and Ice emergency Task Force was formed. This task force determined that a high capacity special purpose snow removal vehicle was needed by the industry, designed for removing the heaviest accumulation from a rail transit system's right-of-way. This Specification Guide is intended as a guide for Snow Belt rail transit operators to use in the preparation of technical specifications for the procurement of snow removal vehicles. It is not intended to be a procurement document. This Guide has been developed to provide the purchaser with a choice as to the type of vehicle and options that will best satisfy site-specific needs. Since the operating constraints of commuter rail are no more restrictive than those for rapid transit, commuter rail operators are encouraged to use this document in the development of their own technical specifications for snow removal vehicles. Only existing, proven design concepts are considered here in the interest of lower costs, shorter delivery times, and avoidance of costly prototype developments for each transit system. The three types of snow removal vehicles described in this Specification Guide are: 1) rail-mounted "jet" blower; 2) rail-mounted rotary blower; and 3) rail/highway rotary blower.

King, C Baker, J  
Kusko (Alexander) Incorporated, Urban Mass Transportation  
Administration Final Rpt. UMTA-MA-06-0025-83-8, DOT-TSC-  
UMTA-83-22, Nov. 1983, 174p Contract DTRS-57-81-C-00010  
ORDER FROM: NTIS PB84-146398

**16 382621**  
**COLD WEATHER TRANSIT TECHNOLOGY PROGRAM.**  
**VOLUME 15—MODELING AND ANALYSES OF THERMAL**  
**CONDUCTION IN SEVERAL ICE MELTING PROBLEMS**

This report is one of a series of reports associated with the Cold Weather Transit Technology (CWTT) program of the Urban Mass Transportation Administration. The CWTT program is a project to improve transit operations in severe ice, snow, and cold environments. The program was initially directed to solutions for automated guideway transit system cold weather problems in support of the downtown people mover program (DPM). However, curtailment of the DPM program in November 1980, caused UMTA to redirect the focus of the program to obtain solutions for cold weather problems of existing transit systems. Therefore, the objective of the CWTT program is to develop new and more effective solutions for cold weather problems experienced by urban mass transportation systems. This report presents heat transfer calculations which were performed to assist in the solution of problems in cold weather mass transit operations. The purpose of this research is to present calculated energy efficiencies and melting rates under the various operating conditions for a radio frequency (RF) induction ice removal process. This process induces the electromagnetic energy in the outer skin of rails with magnetic properties—in this case, at the rail-ice interface. Following the formation of a thin water layer at the interface, the ice is easily scraped off the rail. The authors point out that this effort complements the work in the RF coil design group reported in Volume 14 and the system development test of Volume 5.

Strieder, WC Jayaram, BS  
Notre Dame University, Urban Mass Transportation Administration  
Final Rpt. UMTA-IN-06-0009-8315, Nov. 1983, 41p Contract IN-06-  
0009  
ORDER FROM: NTIS PB84-138957

**16 382800**  
**THE CANNON STREET RAIL BRIDGE**

The repair of the Cannon Street rail bridge, a Victorian bridge in London built in 1864 for the Southern Railway Company, is briefly described. Corrosion found to be occurring in the diaphragm area of the steel crossheads led to the crosshead replacement programme. British Rail decided to cast a concrete collar around the head of each iron column on top of which a concrete slab would be formed. This would provide a walkway to the jacking points from which the main girders would then be raised to enable the corroded steel crossheads to be replaced with new concrete structures. Problems encountered in designing the collar and concrete slab are outlined. It was finally decided to hang gibbet brackets from another point around each collar thus providing a novel supporting

system for the soffit formwork. Explanatory diagrams are provided. (TRRL)

Cousins, R (Coneybear Company Limited) Concrete Vol. 17 No. 5,  
May 1983, pp 30-31, 4 Fig., 2 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 273631)  
ORDER FROM: ESL

**16 382808**  
**DESIGN OF A MOBILE ARTICULATED STRUCTURE FOR**  
**RAILWAY-BRIDGE MAINTENANCE**

This paper describes the design of a machine to enable inspection and minor repairs to be carried out to a wide range of railway structures. The machine, operating from the railway tracks, can be quickly brought into position and will work with minimum interruption to normal rail traffic. In order to maintain stability in the various working positions, often on exposed and windy sites, much of the articulated structure has been designed in aluminium. This paper describes the procedures that have been applied in the structural design of the articulated structure, particularly those relating to the dynamic and configuration requirements. The interdependence of the mechanical and structural aspects of design are apparent. (TRRL)

Falcon, KC Houghton, AF Structural Engineer. Part A Vol. 61A  
No. 11, Nov. 1983, pp 335-542, 11 Fig., 5 Phot., 2 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273546)  
ORDER FROM: ESL

**16 384579**  
**BRITISH STANDARD SAFETY RULES FOR THE**  
**CONSTRUCTION AND INSTALLATION OF ESCALATORS AND**  
**PASSENGER CONVEYORS**

This British Standard has been prepared under the direction of the Mechanical Engineering Standards Committee and is identical with European Standard EN 115 "Safety Rules for the Construction and Installation of Escalators and Passenger Conveyors". The purpose of this standard is to define safety rules for escalators and passenger conveyors in order to safeguard people and objects against risks of accidents during operation, maintenance and inspection work. Existing escalators and passenger conveyors are not subject to this standard. It is, however, recommended that they be adapted to this standard. The standard deals with the following aspects: enclosure, surrounds, supporting structure and lighting, machinery spaces, handrail, steps, pallets, belts and combs, drive for steps, pallets or belts, angle of inclination of the escalator and passenger conveyor and guiding of the steps, pallets and belt, clearance between steps or pallets and between steps or pallets or belt and skirting, machine, electrical installations and appliances, protection against electrical faults and controls, signs, notices for use and signals, and inspection and test, register, and maintenance. (TRRL)

British Standard NBS 5656:1, 1983, 25p, 8 Fig., 9 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 274514)  
ORDER FROM: British Standards Institution, 2 Park Street, London  
W1A 2BS, England

**16 384642**  
**REPLACEMENT OF A RIGID CONCRETE TRACK BY A**  
**CONCRETE TRACK WITH DOUBLE ELASTICITY, CARRIED**  
**OUT ON THE MADRID UNDERGROUND WITHOUT TRAFFIC**  
**DISRUPTION [RENOVACION DE VIA HORMIGONADA**  
**RIGIDA A VIA HORMIGONADA DE DOBLE ELASTICIDAD**  
**REALIZADA EN EL METRO DE MADRID SIN**  
**INTERRUPCION DEL SERVICIO]**

Presentation of a track concreting system in which the track is supported by concrete blocks covered by elastomer on surfaces resting on the invert and side walls. The rail rests on the lower part of the block by means of means of another elastomer of different elasticity; anchoring is ensured by elastic fasteners. This system has an excellent vibration absorption capacity whether at high or low frequency. The most outstanding feature of this method is that it does not cause any traffic disruption. [Spanish]

Galvan, FJ AIT-Revista No. 53, Aug. 1983, pp 12-16, 6 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: Asociacion de Investigacion del Transporte, Alberto Alcocer 38, Madrid, Spain

16 384644

**TRACK RENEWALS ON THE SNCF**

Renewal of a track proves necessary when the day-to-day maintenance operations no longer make it possible, taking into account the volume of the traffic and aging of the equipment, to conserve adequately the geometrical characteristics of the track in question. Apart from the replacement of obsolete equipment, complete renewal of track and ballast makes it possible to provide the new superstructure with the benefits of all the technical progress associated with modern track. The development of techniques tending towards mechanisation has made it possible to obtain better performance and markedly improved quality of work. Today, the advanced technology of the renewal trains also makes it possible to limit the operating constraints on the main routes, by reducing track possession, and by increasing the running speed over the working site. After replacement, the levelling of the new track and removal of constraints allow traffic to run once again at the maximum speed of the line. The results obtained particularly from the economic point of view constitute for the SNCF a decisive stage in the new track maintenance policy.

Alias, J *Rail International* Vol. 14 No. 11, Nov. 1983, pp 28-37, 18 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: ESL

16 384657

**ULTRASONIC MAINTENANCE PAYS**

Ultrasonic listening tools simplify diagnostics in fleet maintenance shops. The utility of such a device in a Florida bus shop is described. Leakage of air and vacuum systems and water leaks in vehicle bodies may all be detected and located. Other versions of the device can be used for probing bearing conditions in wheels, turbochargers, alternators and power steering pumps. The device may also be used for engine diagnosis. Kits may contain tone generators and special probes. Assuming that the diagnostic device is used to its full capability, such an investment can be cost effective.

Cross, R *Commercial Carrier Journal* Vol. 141 No. 3, Mar. 1984, pp 61-63, 4 Phot.

ORDER FROM: Chilton Company, Incorporated, One Chilton Way, Radnor, Pennsylvania, 19089

16 384880

**SITUATION AND DEVELOPMENT OF THE DB PASSENGER STOCK OPERATING TECHNICAL DEPARTMENT [STAND UND ENTWICKLUNG DES TECHNISCHEN WAGENBETRIEBSDIENSTES FUER DIE REISEZUGWAGEN DER DB]**

If one considers the volume of work involved and costs incurred, vehicle cleaning can be taken to be the main task of the DB's passenger stock Operating Technical Department. Important optimisation studies were carried out and resulted in the introduction of a new system described in the present article. [German]

Boden, N *Eisenbahntechnische Rundschau* Vol. 32 No. 10, Oct. 1983, pp 659-664, 3 Tab., 7 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

16 384881

**CONCENTRATION AND OPTIMISATION OF TECHNICAL FACILITIES FOR THE HANDLING OF COACHES AT THE DB [KONZENTRATION UND OPTIMIERUNG DER TECHNISCHEN ANLAGEN ZUR BEHANDLUNG DER REISEZUGWAGEN BEI DER DEUTSCHEN BUNDESBahn (DB)]**

Technical facilities for the handling of passenger stock on the DB network and in stations have been concentrated and optimised even further since the implementation of a new system for the cleaning of coaches and railcars. Linked to the application of a method aiming at guaranteeing quality, this system presents a major step forward in the rationalisation of technical services for passenger stock operation. [German]

Griesshammer, W *Eisenbahntechnische Rundschau* Vol. 32 No. 10, Oct. 1983, pp 667-676, 2 Phot., 3 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

16 384905

**HEALTH HAZARD EVALUATION REPORT NO. HETA 81-452-1128 SANTA CRUZ METROPOLITAN TRANSIT DISTRICT. SANTA CRUZ, CALIFORNIA**

On September 23-25, 1981, peak C concentrations averaged 6 ppm and peak total hydrocarbon concentrations 3 ppm. No overexposures to C or alkanes were measured based on NIOSH-recommended time-weighted average criteria (C—35 ppm; alkanes C5 to C8—350 mg/cu m). The CO<sub>2</sub>, NO<sub>2</sub> and SO<sub>2</sub> air concentrations were below the limit of detection. No formaldehyde was detected. Total particulate (soot) ranged from none detectable to 0.06 mg/cu m. However, the diesel bus drivers (8) reported a high prevalence of eye and upper respiratory symptoms, while the gasoline bus drivers reported a high prevalence of headaches and upper respiratory irritation. Drivers of diesel engine buses were not overexposed to CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>2</sub>, formaldehyde, total particulate, or polynuclear aromatic hydrocarbons, even though diesel fumes were periodically smelled when the engine was at idle.

Belanger, P Coye, M  
National Institute for Occupational Safety & Health HETA-81-452-1128, June 1982

ORDER FROM: NTIS PB84-138254

16 384906

**HEALTH HAZARD EVALUATION REPORT NO. HETA 81-388-1129. SANTA CRUZ METROPOLITAN TRANSIT DISTRICT. SANTA CRUZ, CALIFORNIA**

On August 19-20, 1981, environmental and medical surveys were conducted during diesel and gasoline bus servicing. Based on the environmental air samples collected during the dates of the survey. Overexposure to CO, CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>2</sub>, and total particulate did not exist. However, significant short-term exposures to formaldehyde were measured depending on workers job task, the time of the shift, and the mechanical condition of the bus. The symptoms reported and/or experienced by the workers are generally consistent with formaldehyde exposure and diesel fume exposure.

Belanger, P Coye, M  
National Institute for Occupational Safety & Health HETA-81-388-1129, June 1982, 22p

ORDER FROM: NTIS

17 380200

**NON-CONTACT SUSPENSION AND PROPULSION TECHNOLOGY**

As a result of extensive research and development in several countries, the technologies of magnetic suspension and linear electric drives are becoming available for transportation applications. The successful demonstration and operation of prototype vehicles has established the technical viability of these systems. Several urban transit or shuttle services, with magnetic suspension and/or linear motor propulsion are likely to be operational within 3-4 years. After the final stages of development and rigorous testing, high speed systems are likely to be an option for intercity implementation by the end of the decade. This paper presents a report on the worldwide status of R&D and test programs of non-contact suspension and propulsion technology for guided ground transport.

Alscher, H *Vehicle System Dynamics* Vol. 12 No. 4-5, Aug. 1983, pp 259-289

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

17 380230

**THE VEHICLE OF THE EMSLAND TRANSPERAPID TEST FACILITY (TVE)**

This report describes the concept and the purpose of the Emsland TRANSPERAPID Test Facility. In addition, it includes the design and performance of the vehicle TRANSPERAPID 06. The underlying principle of development is to accelerate and decelerate the train electrically by means of an iron-cored long-stator synchronous motor, whereby no friction between the track and train occurs.

Borchert, J Parnitzke, RA *Journal of Advanced Transportation* Vol. 17 No. 1, 1983, pp 57-71

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

17 380232

**DEVELOPMENT OF THE MAGNETICALLY LEVITATED TRAIN**

The Japanese National Railways is now pursuing studies and development of a magnetically levitated train wherein are combined the levitating system with super conducting magnets and the propulsion system with linear synchronous motors, on the Miyazaki test run track. The author reviews developments since 1977 in the vehicles, test facilities, etc. and refers to future plans.

Sasaki, M *Japanese Railway Engineering* Vol. 22 No. 4, 1983, pp 20-24

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

17 380233

**PROJECT DESIGN OF A MAGLEV SYSTEM WITH SHORT STATOR LINEAR MOTOR PROPULSION**

This paper presents a short stator MAGLEV configuration for high speed application (400 km/h) based on an improved suspension technique. The system applies one set of electromagnets for levitation and also for guidance, utilizing the self-centering effect of laterally displaced magnets, and thus providing for strictly passive vehicle guidance. This use of a combined system helps to minimize vehicle weight and thus to reduce cost-effective track loading. Propulsion consists of liquid-cooled double-sized linear induction motors, which are supplied by static inverters with a boiling cooling technique, in order to achieve low volume for vehicle installations. The simple and passive track equipment can reduce capital investments significantly. Cooling the static inverter with a heat exchange medium which boils provides higher heat transfer rates per unit area and limits temperature rise more effectively than the more commonly used liquid coolants.

Gaede, P-J *Journal of Advanced Transportation* Vol. 17 No. 1, 1983, pp 49-56

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

17 380814

**CONTRIBUTION ON NEW LINE LAY-OUT [BEITRAEGE ZUR GROSSRAEUMIGEN NEUTRASSIERUNG]**

This document is an introduction to the electromagnetic levitation technique and comments upon the special requirements with which track layout should comply. After a review of studies carried out to date, the authors show the scope for application of fast electromagnetic networks; they describe the new levitation, guiding and forward motion/braking techniques with the requirements they imply for track lay-out. [German]

Schriftenreihe Wissenschaftlicher Studiengang Verm No. 6/DB: Dok 5887, 1982, 268p, 10 Tab., 10 Phot., 10 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Schriftenreihe Wissenschaftlicher Studiengang Verm, Munich, West Germany

17 380823

**CONSTRUCTION OF THE CONCRETE TRACK FOR THE TRANSPERAPID TEST SITE AT EMSLUND (TVE) [BAUAEUFUEHRUNG DES BETONFAHRWEGES DER TRANSPERAPID VERSUCHSANLAGE EMSLUND—TVE]**

The construction of the 15.8 km of track for this test site must be as precise as a steel construction, yet pre-stressed concrete will be used. The article presents the design of prefabricated bearing structures (from 12 to 37 m), manufacture of substructures and of truck-carrying pylons (pylon framing, concrete technology), transport and assembly which must correspond exactly to the dimensions fixed. [German]

Loennecke, KH Stueben, HH *Bauingenieur* Vol. 58 No. 4, 1983, pp 129-134, 10 Phot., 6 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Springer-Verlag, Heidelberger Platz 3, 1000 Berlin 33, West Germany

17 381452

**GATWICK GETS RAPID TRANSIT**

Details are given of the rapid transit system recently opened at Gatwick Airport. The system comprised a 335M double track Westinghouse people mover and has been introduced to link the new satellite area with the existing terminal buildings. The model C100 cars have 8 seats each with a nominal capacity of 100 and take 45s to complete their journey. Station dwell time is only 20s 50, with cars synchronised to leave opposite termini together. There is a departure every minute with a capacity of 4000 passengers per hour per direction. There are three main control systems: atp (automatic train protection-controls the safe movement of trains); ato (automatic train operation-speed control stopping control, door operation, etc.); and als (automatic line supervision-monitors system operation). Each car has two on-board microprocessors and these are supported by one terminal-based process control computer. A number of the fail-safe features incorporated in the system are described. The system is expected to operate 24 hours a day and during hours of low demand it may be modified so that cars run only on demand initiated by a passenger pressing a button at a station.

Wyse, WJ *Modern Tramway and Light Rail Transit* Vol. 46 No. 547, July 1983, pp 227-229, 3 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 272827)  
ORDER FROM: Allan (Ian) Limited, Terminal House, Shepperton TW17 8AS, Middlesex, England

17 381457

**SAN FRANCISCO CARS GET ALL NEW TRACK**

A description is given of some of the features of the \$50M rehabilitation project now in progress on San Francisco's cable cars. Every section of track is being replaced by substantially founded reinforced concrete yoke supporting stiff heavy section flat bottomed girder rail. Preliminary calculations suggested that 24 blocks would need to be opened up at a time to get the job done so the work was split into six contracts which had the advantage of causing very competitive bidding. Radical changes are being made to the machines for driving the cables at their constant 14.5 m/hr. The new machinery is to have separate motors for each rope. New technology is expected to make the operation of the cars more reliable, but several new ideas that were tried demonstrated that the empirical solutions of the past were the best.

Winney, M *New Civil Engineer* No. 547, June 1983, 3p, 5 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 272904)  
ORDER FROM: Institution of Civil Engineers, 1-7 Great George Street, Westminster, London SW1P 3AA, England

**17 381508  
FIXED GUIDEWAY TRANSIT STUDY**

Fixed guideway, by Federal statute definition, involves any mass transportation service which utilizes a separate right of way or rails and includes rail commuter service, rail transit, automated guideway transit, busways, trolley buses, inclines and cable cars. This survey revealed that there are 30 existing systems operating almost 3,500 route miles and carrying 2 billion passengers annually. The mechanisms of state and local financing for the \$1.8 billion in annual subsidies these systems require were analyzed. Despite concern for current and future funding constraints, extensive fixed-guideway extensions are under construction or in advanced planning. Excluding rail commuter services, new systems and extensions will double the number and route miles of fixed-guideway transit facilities. Eight of 23 new systems are under construction and 6 of 12 extensions will also be at least partially completed by 1986. Light rail is an increasingly attractive fixed-guideway option. At least \$16 billion will be required for projects already planned and over half of this funding is anticipated to come from Federal sources.

American Assn of State Hwy and Transp Officials Nov. 1983, 22p, 14 Tab.

ORDER FROM: American Assn of State Hwy and Transp Officials, Fixed Guideway Transit Task Force, Washington, D.C., 20001

**17 381522  
THE DORTMUND SUSPENDED RAILWAY (H-BAHN).  
ASPECTS OF THE DEMONSTRATION LINE [H-BAHN  
DORTMUND. DIE BESONDERHEITEN DER BETRIEBLICHEN  
DEMONSTRATIONSANLAGE]**

In 1981 Dortmund University began building a demonstration line for a suspended railway system (H-Bahn) between two University centres. The aim was to prove that the system as a whole was a viable proposition from the technical point of view, to assess operating costs and examine how far it could help to relieve traffic congestion on the roads. The authors describe the constraints with which the line layout has to comply, particularly from the environmental point of view. The basic operating concept involves regular-interval traffic and a special call service, both computer-controlled. The experimental line will be operated for a two-year trial period. [German]

Heinke, G Juenemann, R Otto, *KD Verkehr und Technik* Vol. 36 No. 7, July 1983, pp 236-242, 7 Phot., 7 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Schmidt (Erich) Verlag, Herforder Strasse 10, 4800 Bielefeld, West Germany

**17 381531  
THE H-BAHN (SUSPENDED RAILWAY): PREPARATION AND  
ASSEMBLY OF THE TRACK, STATIONS AND MAINTENANCE  
WORKSHOP FOR THE DORTMUND EXPERIMENTAL LINE  
[H-BAHN. FERTIGUNG UND ERRICHTUNG DER FAHRBAHN,  
DER STATIONSGEBAEUDE UND DER WARTUNGSHALLE  
FUER DIE DEMONSTRATIONSANLAGE DORTMUND]**

The track consists of 41 beams over a total length of 1,087 m. Assembly work was completed in 1982. The two station buildings are identical. The latest developments concern beam suspension, active switches and facilities for handicapped passengers. [German]

Hillmer, A Bunzel, *P Verkehr und Technik* Vol. 36 No. 8, Aug. 1983, pp 267-277, 20 Phot., 2 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Schmidt (Erich) Verlag, Herforder Strasse 10, 4800 Bielefeld, West Germany

**17 381590  
ACTIVE-SYNCHRONIZATION CONTROL SYSTEM FOR DC  
LINEAR MOTOR**

The active-synchronization control system is a new speed control system for dc linear motors which was developed as a traction and suspension system for high speed ground transportation. It synchronizes the train with the set speed after accelerating or decelerating it to the set speed by a simple unit comprising a timer and logical elements. This paper explains the principle and application of the active-synchronization control system.

Matsuoka, K Umemori, *T Railway Technical Research Inst, Quarterly Reports* Vol. 24 No. 1, Mar. 1983, pp 19-25

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**17 382051  
THE LOS ANGELES DOWNTOWN PEOPLE MOVER—  
CONCEPT TO REALITY**

The impetus behind the Los Angeles Downtown People Mover (DPM) program and the multi-phase planning behind its implementation are described. The DPM is planned as a totally grade separated, Automated Guideway Transit (AGT) system providing circulation/distribution service along a 3-mi. route. It will intercept passengers at multimodal transportation centers located at end of the line. The DPM is one element of a four-part Regional Transit Development Plan; other elements are improved local and regional bus service and paratransit services, express bus-on-freeway service, and a rail "Starter Line" from Downtown L.A. to North Hollywood. The People Mover will operate on a scheduled frequency of 90 sec. to 4.5 min., depending on the time of day. Stations and vehicles will be unmanned; operations will be directed from a control center. There will be 13 stations, with patronage projected at 72,400/day by 1990. Contracts for the \$175 million AGT project are to be awarded by the end of 1980, with operation commencing as early as 1984. Positive economic impacts are already being demonstrated in the form of new high-rise office construction.

Conference held in Dearborn, Michigan, 15-17 September 1980. Also published in HS-030 396 (IEEE-80CH1601-4; SAE-SP-90), "Convergence 80. IEEE Vehicular Technology Society Annual Conference (30th), International Conference on Transportation Electronics Proceedings," Utica, Michigan, 1980.

Townsend, DT (Los Angeles Downtown People Mover Authority)  
Institute of Electrical & Electronics Engrs, Inc, Society of Automotive Engineers, Incorporated IEEE-80CH1601-4, HS-030 457, 1980, 4p

ACKNOWLEDGMENT: National Highway Traffic Safety Administration  
ORDER FROM: Institute of Electrical & Electronics Engrs, Inc, Service Center, 445 Hoes Lane, Piscataway, New Jersey, 08854

**17 382253  
DAMPING CHARACTERISTICS AND AC MAGNETIC FIELD  
OF REPULSIVE MAGNETIC LEVITATION**

A magnetic levitation system composed of superconducting magnets and guideway coils may have unstable damping forces and an ac magnetic field which generate eddy current losses in the cryostat and affect the low temperature system. This paper reports on experimental results of the magnetic damping characteristics and ac magnetic field in the cryostat, using rotary test equipment. Analytical results are derived from calculating the magnetic field generated by currents in superconducting magnets, guideway coils and damper sheet and thermal shield plate.

Fujiwara, S Hariyama, *T Railway Technical Research Inst, Quarterly Reports* Vol. 24 No. 2, June 1983, p 93

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**17 382270  
SAFETY CONSIDERATIONS FOR AUTOMATED MIXED  
TRAFFIC TRANSIT (AMTT) SYSTEMS**

The concept of Automated Mixed Traffic Transit (AMTT) systems, whereby driverless vehicles operate in mixed traffic on public thoroughfares, has been proposed as a means to meet selected transportation applications. Indeed, such systems have been under development for

several years although, at present, none is in public service. A major concern of such operations is safety, both for the AMTT vehicles and their passengers and for the traffic (other vehicles and people) in which these vehicles will operate. AMTT systems and associated operations have safety considerations which are in part common to existing forms of public transit and in part peculiar to the AMTT concept. This paper discusses these with emphasis on the latter type.

Thompson, RE *Journal of Advanced Transportation* Vol. 17 No. 2, 1983, pp 103-118

ACKNOWLEDGMENT: British Railways  
ORDER FROM: Institute for Transportation, Incorporated, 1410  
Duke University Road, Durham, North Carolina, 27705

#### 17 382283 VISUAL AESTHETIC IMPACTS OF AGT GUIDEWAYS

Research discussed in this report developed and tested several of the implementable assessment and display techniques identified in the report AGT Aesthetics. The objective of the research was to develop a visual assessment methodology that would achieve the following: 1) apply recognized principles of urban design to AGT guideways; 2) identify key visual aesthetic impact issues; 3) identify specific interest groups which might have different opinions regarding visual impacts; 4) measure preferences of interest groups for alternative design characteristics; and 5) assist in developing guidelines for minimizing negative impacts and maximizing positive impacts. The report presents a methodology for assessing preferences of the public for alternative AGT guideway designs. The methodology was developed and tested in Morgantown, West Virginia. The methodology statistically analyzes expressed preferences (on a ten point scale) for alternatives depicted on photo-montages. Significance of differences in preference among different interest groups (business, community organizations, the general public) as well as differences in preference for design features (guideway location, height, column spacing, and architecture) can be evaluated. The method also allows comparison of street-level appearances with and without the guideway. The method, developed after an extensive literature review and several pilot studies, is described in Chapter 3 and illustrated in Chapter 4. Study results are presented in Chapter 5.

Kvashny, A  
West Virginia University, Urban Mass Transportation Administration  
Final Rpt. UMTA-WV-11-0003-84-1, Jan. 1983, 96p

ORDER FROM: NTIS PB84-149392

#### 17 382567 MAGLEV SKY TRAIN

In ultra-high-speed transportation systems, vehicles are magnetically levitated, guided and propelled by synchronous linear induction motors along an elevated guideway at speeds up to 250 mph. Such a system is under study for a line between Los Angeles and Las Vegas. The status of magnetic levitation in Germany and Japan is also discussed. The West German government is sponsoring an electromagnetic ("attractive") system and has built a test track; Japanese National Railways has an electrodynamic ("repulsive") test facility. The maglev technologies are compared.

Dickhart, WW, III Pavlick, MJ (Budd Company) *Mechanical Engineering* Vol. 106 No. 1, Jan. 1984, pp 26-34, 4 Fig., 4 Tab., 2 Phot.

ORDER FROM: ESL

#### 17 382632 COMPOSITE SUPERCONDUCTORS

Advanced medical diagnostics systems, magnetically-levitated railway trains, superconducting electrical generators and nuclear particle accelerators are all benefiting from the latest developments in composite superconductors.

Chawla *Engineer* Vol. 224 No. 1, Jan. 1984, pp 39-41

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

#### 17 382633 PERMANENT-MAGNETIC SUSPENSION AND PROPULSION SYSTEM USING TRAVELLING MAGNETIC FIELD IN THE GUIDEWAY. 1

The two characteristic features of the magnetic-levitation, M-Bahn system, i.e.—levitation system using permanent magnets and—propulsion system using travelling magnetic field of devices installed in the guideway are described. Additional specific components of the system, automation, vehicle design, guideway and costs in comparison to conventional railway transport systems will be dealt with in future papers. [German]

Heidelberg, G *Glaser's Annalen ZEV* Vol. 107 No. 12, Dec. 1983, pp 401-404

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

#### 17 382634 PROSPECTS OF MAGNETIC-LEVITATION TRANSPORT SYSTEMS

Following an outline of the possible applications of a magnetic-levitation transport system embodying the technical concept of the Emsland Transrapid test facility (TEV), the currently most promising project of a rapid transit system between Los Angeles and Las Vegas is described. The paper then discusses the possibilities available for implementing a Transrapid integrated network in Central Europe, which could also include a network in the German Federal Republic, and its effects on society and especially on the labour situation. [German]

Hessler, H *Glaser's Annalen ZEV* Vol. 107 No. 12, Dec. 1983, pp 405-410

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

#### 17 382635 TECHNICAL CONCEPT AND SYSTEM DATA OF A MAGNETICALLY SUSPENDED TRAIN WITH PROPULSION BY SHORT STATOR LINEAR INDUCTION MOTORS

The design of a short-stator Maglev train, to be operated at 400km/h cruise speed, will be described. A self-centering, combined electromagnetic system is applied in order to provide levitation and guidance of the vehicle. The propulsion system will incorporate a liquid-cooled, double-sided linear induction motor, supplied by static inverters using boiling cooling technique. A comprehensive system design, following full-scale operational loads, has been carried out, including detailed construction work with regard to the installation of high-power equipment on board of the vehicle. In addition, testing of key components has been performed in order to prove its production stage. Concerning vehicle weight and volume, the penalty arising from the installation of the propulsion equipment is basically compensated due to the merits of the simple design of the levitation and guidance system. Improved technical solutions for the design of the guideway and its track equipment will result in a significant reduction of investment. [German]

Gaede, P-J *Glaser's Annalen ZEV* Vol. 107 No. 12, Dec. 1983, pp 411-416

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

#### 17 384578 CHASSIS DYNAMICS RELATED TO A LOW-COST MAGNETICALLY SUSPENDED VEHICLE

Interaction introduced by the chassis structure of a magnetically suspended vehicle can deteriorate the performance of the suspension controllers. The paper presents a comparison between two particularly simple chassis structures and the design constraints introduced by misaligned tracks. (Author/TRRL)

Gondhalekar, VM Jayawant, BV (Sussex University, England) *IEE Proceedings* Vol. 130 No. 2, Mar. 1983, pp 83-92, 15 Fig., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 274598)  
ORDER FROM: ESL

17 384655

**ENVIRONMENTAL IMPACT STATEMENT FOR DETROIT PEOPLE MOVER**

Since 1968 studies in southeastern Michigan have addressed the feasibility of an automated people mover to serve the Detroit central business district (CBD). The two goals of such a system have been to facilitate travel and to improve the economic functioning of the CBD. In September 1978, preliminary engineering of the Detroit people mover began under a federal demonstration program. The draft environmental impact statement (EIS) was circulated in March 1980, and the final EIS followed in December 1980. Construction of the 3-mile, elevated, single-lane loop alignment around the Detroit CBD was proposed to begin in the spring of 1983; revenue service was scheduled to begin in 1985. The major environmental issues were both procedural and technical. A significant procedural issue was the desire to make the final EIS an all-purpose environmental document that satisfied all the state and federal environmental requirements. Waiting for clearance by Section 106 of the Historic Preservation Act and Section 4 (f) of the Department of Transportation Act of 1966 delayed publication of the final EIS but facilitated the overall completion of environmental requirements. The key technical issue was the integration of an elevated guideway into a CBD containing numerous historic buildings and districts. Coordination with the State Historic Preservation Office was essential to developing an acceptable system. It was eventually possible to finalize plans for a system that would have an adverse effect on only three historic sites.

This paper appeared in Transportation Research Record No. 921, Cost-Effectiveness of Air-Quality Control Measures and Impact of the Environmental Review Process.

Beard, S (Schimpler-Corradino, Associates); Rushfeldt, T (Touche, Ross and Company) **Transportation Research Record** No. 921, 1983, pp 19-24

ORDER FROM: TRB Publications Off DOTL JC

17 384884

**THE VEHICLES OF THE SUSPENDED RAILWAY SYSTEM AT DORTMUND UNIVERSITY [DIE FAHRZEUGE DES H-BAHN-SYSTEMS UNIVERSITAET DORTMUND]**

The test equipment has two 4-tonne suspended vehicles, offering 42 seats each and automatically driven (maximum speed: 50 km/h), and an inspection vehicle. The vehicle elements include an underframe and running gear, suspension, a bolster and the cab structure. The cab is built of fire-proof materials. The running gear has two braking devices. The (H-Bahn) suspended railway is designed for fully automatic operation, controlled by computers situated on the ground. [German]

Giesen, U Mueller, S **Verkehr und Technik** Vol. 36 No. 10, Oct. 1983, pp 371-382, 16 Phot., 1 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration

ORDER FROM: Schmidt (ERICH) Verlag, Herforder Strasse 10, 4800 Bielefeld, West Germany

17 384913

**BIRMINGHAM MAGLEV OFF TO FLYING START**

The world's first commercial maglev, scheduled for operation in April 1984, involves a double-track 0.62-km guideway linking the British Railways Birmingham station with the airport terminal. This people mover has a theoretical maximum capacity of 3200 passengers per hour in each direction, carried in a pair of two-car, 80-passenger trains operating on independent tracks and taking about 90 seconds for each one-way trip with a top speed of 40 mph. The electromagnets under each car are part of an attraction maglev system with sensors regulating vertical and lateral air gaps to assure ride quality and minimize power consumption. Trains are propelled and braked by linear induction motors under each vehicle. Automatic train operation controls the motors and magnetic levitation. The article also includes information on high-speed maglev tests in Germany and Japan. The Birmingham airport maglev was built by a British industrial consortium called the People Mover Group, with its research funded by the consortium, and by local and British governments.

Hamer, M **New Scientist** Vol. 101 No. 401, Mar. 1984, pp 25-27

ORDER FROM: IFC Magazines Limited, King's Reach Tower, Stamford Street, London SE1 9LS, England

17 385306

**ACTIVE CONTROLS IN GROUND TRANSPORTATION—A REVIEW OF THE STATE-OF-THE-ART AND FUTURE POTENTIAL**

Active control systems offer significant functional advantages over passive systems; their introduction into production-line vehicles, however, is cautious and slow. This survey describes the recent progress in the analysis, design and technology of active controls in vehicles. It includes the state-of-the-art of their introduction into operation as well as their future potential in view of recent advances in technology and computer aided design strategies. The survey has been limited to suspensions for vehicles on roads and tracks.

Goodall, RM (Loughborough University of Technology, England);

Kortum, W (Institute for Dynamics of Flight Systems, DFVLR) **Vehicle System Dynamics** Vol. 12 No. 4-5, HS-035 809, Aug. 1983, pp 225-257, Figs., 135 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration

ORDER FROM: Swets en Zeitlinger BV, Heerweg 347B, 2161 CA Lisse, Netherlands

**21 380179**  
**EFFECT OF CROWDING ON LIGHT RAIL PASSENGER BOARDING TIMES**

Passenger congestion may have important effects on passenger level of service and station stop or dwell times. In order to examine this concept, research on boarding and alighting times of passengers on light rail vehicles was conducted by sampling rush-hour operations on the Presidents' Conference Committee vehicles of the Massachusetts Bay Transportation Authority's (MBTA) Green Line, a high-volume, light rail subway-surface line. The boarding process is emphasized here, but similar treatment has been undertaken for alighting. Linear regression relations were calibrated between the number of passengers boarding per unit time and concurrent passenger counts (or densities) on board the vehicle and on the platform. These alternatively formulated models reflect the trends in the raw data that the boarding rates decline markedly under increasing congestion, especially as the space per standee falls below the often used nominal standee space level of 2.7 ft<sup>2</sup>/standee and approaches crush-capacity density of 1.5 ft<sup>2</sup>/standee. On the other hand, at freer circulation levels, these models provide predictions quite similar to predictions from constant-service-time models frequently formulated in earlier research. The modeling approach and subsequent results can be absorbed in future research and operational endeavors for MBTA, for other operating authorities, and for vehicle manufacturers in (a) quantifying the effects of passenger congestion on travel time and reliability, (b) permitting more refined simulation models of travel time, (c) providing a practical approach toward evaluation of realistic vehicle capacity through knowledge of circulation difficulties manifested in low boarding rates, (d) supporting short-term and low-cost operational measures to alleviate frequent problems of rush-hour service, and (e) planning new system or rolling stock requirements.

This paper appeared in Transportation Research Record No. 908, Transit Terminal Facilities and Urban Rail Planning.

Fritz, MS (Department of Health and Human Services)  
 Transportation Research Record No. 908, 1983, pp 43-50, 5 Fig., 2 Tab., 8 Ref.

ORDER FROM: TRB Publications Off DOTL JC

**21 380223**  
**TIMETABLE OPTIMIZATION FOR RAPID TRANSIT RAILWAYS: A CONTRIBUTION TO ECONOMICAL OPERATION**

For twenty years the Hamburger Hochbahn has been occupied with the problem of optimizing the operating costs of rapid transit railways. A concept was produced which takes into consideration all the factors which have an influence on the operating costs. This is described in the article, which also shows how the optimization of the timetables of existing rapid transit railways can be achieved. [German]

Mies, A Eisenbahntechnische Rundschau Vol. 32 No. 7-8, July 1983, 5p

ACKNOWLEDGMENT: British Railways  
 ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

**21 380260**  
**PREDICTING TRANSIT RIDERSHIP IN RESPONSE TO TRANSIT SERVICE CHANGES**

This paper reports the development of a simplified form of the multinomial logit model and its application to the prediction of travel mode shares for a range of transit service changes. Equations for predicting transit share for a new or improved service are presented. Procedures which can be employed to use the proposed equations to estimate transit ridership in a specific corridor conditional on the establishment of different levels of public transportation service are described.

Koppelman, FS (Northwestern University, Evanston) Journal of Transportation Engineering Vol. 109 No. 4, July 1983, pp 548-564, 23 Ref.

ACKNOWLEDGMENT: EI  
 ORDER FROM: ESL

**21 380774**  
**COMPUTER SIMULATION AND PROGRAMMING. SUMMARY OF R-44 PERFORMANCE TESTS. TECHNICAL MEMORANDUM**

This interim report provides data on the performance characteristics of New York City Transit Authority Type R-44 rapid transit cars and data accumulated during four instrumented trips of a train of 8 of these cars against which computer simulation output can be compared.

New York City Transit Authority, Tri-State Regional Planning Commission, Metropolitan Transportation Authority, Long Island Rail Road, Department of Transportation, Urban Mass Transportation Administration IT-09-0031, TS C140, No Date, v.p., 5 Fig.

ORDER FROM: New York City Transit Authority, 370 Jay Street, Brooklyn, New York, 11201

**21 380775**  
**COMPUTER SIMULATION AND PROGRAMMING. FINAL REPORT**

An overall technical study to develop a computer simulation model for the entire New York City transit system, including extensions now under construction, has been done in two phases. Phase 1 consisted of an inventory, evaluation and selection of an appropriate method for simulation of the complete system. Following selection of the method, a portion of the E and F lines of the IND Division was programmed for simulation and evaluation. Under Phase 2, the simulation was expanded to cover the entire system, as well as incorporating enhancements and improving the program developed in Phase 1. A validation of the expanded simulation model was performed. Completion of these two technical studies has provided NYCTA with sets of computer programs that can be used for validation of the location of crossovers and switches, validation of train control and operational criteria, and the ability to computerize train scheduling. This final report provides detailed information on the nature and objectives of the project, the work performed, and analysis of project results.

New York City Transit Authority, Tri-State Regional Planning Commission, Metropolitan Transportation Authority, Urban Mass Transportation Administration, Department of Transportation, Long Island Rail Road IT-09-0031/37/69/89, TS C140, Sept. 1982, 62p

ORDER FROM: New York City Transit Authority, 370 Jay Street, Brooklyn, New York, 11201

**21 380776**  
**COMPUTER SIMULATION AND PROGRAMMING. FEASIBILITY STUDY. SIMULATION SYSTEM VALIDATION REPORT**

Following a survey of existing simulations, it was determined that the most feasible method of simulating New York City Transit Authority service would be adaptation of the existing Long Island Rail Road Simulation System, modified and enhanced to model accurately the signal system, equipment, operation, rules and procedures of NYCTA. Results are presented comparing field test data against the corresponding simulation tests, and also the results of comparing the simulation of a 24-hr day against the historical data of an actual day.

New York City Transit Authority, Tri-State Regional Planning Commission, Metropolitan Transportation Authority, Long Island Rail Road IT-09-0031, TS C140, Apr. 1975, v.p., Figs.

ORDER FROM: New York City Transit Authority, 370 Jay Street, Brooklyn, New York, 11201

**21 380777**  
**COMPUTER SIMULATION AND PROGRAMMING. REFERENCE MANUALS, VERSION I, VOLUMES I-IV**

The New York City Transit Authority Simulation System, developed from the Long Island Rail Road Simulation System, effectively and economically depicts NYCTA performance. Results can be the basis for informed judgements concerning the type of modifications that should be made in equipment and schedules. The NYCTA Simulation System documentation consists of four volumes: Volume I—Reference Manual, contains a summary of the system's applications and features along with a description of the types of input data and instructions for running the programs and interpreting their output; Volume II—Data Preparation Manual, describes data conventions, coding formats and the data checking utility program;

Volume III-Program Design Manual, is divided into two sections, the first containing narrative descriptions of the components of the simulation system and the second with descriptions of the internal tables used by the various components; Volume IV—Program Listing Manual, is divided into three sections: Input Editor phase, Simulation phase, and Output Editor phase.

New York City Transit Authority, Tri-State Regional Planning Commission, Metropolitan Transportation Authority, Urban Mass Transportation Administration, Department of Transportation, Long Island Rail Road IT-09-0031/31, TS C140, May 1976, 202p, Figs., Tabs.

ORDER FROM: New York City Transit Authority, 370 Jay Street, Brooklyn, New York, 11201

**21 380778**  
**COMPUTER SIMULATION AND PROGRAMMING.**  
**SIMULATION AND SYSTEM VALIDATION REPORT**

The interim report covering Expanded Simulation System, describes the New York City Transit Authority Simulation System, developed from the Long Island Rail Road Simulation system. NYCTA performance is depicted effectively and economically. Results produced can be the basis for informed judgements concerning the type of modifications that should be made in rapid transit operations, scheduling, train control and train flow.

New York City Transit Authority, Tri-State Regional Planning Commission, Metropolitan Transportation Authority, Long Island Rail Road, Urban Mass Transportation Administration, Department of Transportation IT-09-0031, TS C140, Apr. 1981, v.p., Figs.

ORDER FROM: New York City Transit Authority, 370 Jay Street, Brooklyn, New York, 11201

**21 380779**  
**COMPUTER SIMULATION AND PROGRAMMING.**  
**REFERENCE MANUALS, VERSION II, VOLUMES I-IV**

The New York City Transit Authority Simulation System effectively and economically depicts the performance of the NYCTA. Results produced can be the basis for informed judgments concerning the modifications that should be made in equipment and schedules to provide safe, rapid and reliable transportation. The NYCTA Simulation System documentation consists of four volumes: Volume I—Reference Manual, contains a summary of the system's applications and features along with a description of the types of input data and instructions for running the programs and interpreting their output; Volume II—Data Preparation Manual, describes data conventions, coding formats and data checking utility program; Volume III—Program Design Manual, is divided into two sections, the first containing narrative descriptions of the components of the simulation system and the second with descriptions of the internal tables used by the various components; Volume IV—Program Listing Manual, is divided into three sections: Input Editor phase, Simulation phase, and Output Editor phase.

New York City Transit Authority, Tri-State Regional Planning Commission, Metropolitan Transportation Authority, Urban Mass Transportation Administration, Department of Transportation, Long Island Rail Road IT-09-0031/37, TS C140, July 1981, 198p, Figs., Tabs.

ORDER FROM: New York City Transit Authority, 370 Jay Street, Brooklyn, New York, 11201

**21 380790**  
**PEAKS, RUSH HOURS, HIGH PEAKS**

This article looks at the ways in which railway systems handle peak traffic periods. It investigates the problems associated with handling peak loadings, looks at the effects of system geography on train workings, explains how uninformed comment can wrongly reflect the actual situations, analyses the incompatibilities created by elements such as service mix and conflicting movements, and discusses train service planning methods and operational practices. Particular attention is paid to the urban electric systems in Sydney, Melbourne and Brisbane.

Network-Railways of Australia Quarterly Vol. 19 No. 3, Sept. 1982, pp 53-58

ACKNOWLEDGMENT: ATLIS Bulletin  
 ORDER FROM: Network-Railways of Australia Quarterly, Melbourne, Victoria, Australia

**21 380796**  
**DECATUR PUBLIC TRANSIT SYSTEM TRANSIT**  
**DEVELOPMENT PROGRAM**

The Transit Development Program for the Decatur Public Transit System is a five-year transit service plan for the period, Fiscal Years 1983-1987. This five-year development plan, which includes capital and operating budgets reflective of planned service levels, will help to determine the extent of future expenses and resultant revenue needs. The study provides a series of operational alternatives available to the City of Decatur, Illinois to maximize the resources of the transit system in providing efficient and economical public transportation to the local community.

Little, G Robertson, M Harbour, M Flagg, L, III  
 ATE Management and Service Company, Incorporated, Urban Mass Transportation Administration Final Rpt. UMTA-IL-09-0070, May 1983, 250p, 19 Fig., 8 App. Grant IL-09-0070  
 ORDER FROM: ATE Management and Service Company, Incorporated, 617 Vine Street, Suite 800, Cincinnati, Ohio, 45202

**21 380861**  
**THE INFLUENCE OF AN INCREASE IN DISTANCE**  
**BETWEEN BUS STOPS ON ENERGY CONSUMPTION AND**  
**PUBLIC TRANSPORT DEMAND [HET EFFECT VAN EEN**  
**VERGROTING VAN DE HALTE AFSTAND OP HET**  
**ENERGIEVERBRUIK EN OP DE VRAAG NAAR OPENBAAR**  
**VERVOER]**

Increasing distances between bus stops is an important factor for energy saving in public transport operations. On the other hand, spacing bus stops on a larger scale decreases accessibility. A model is needed for finding an optimum distribution of bus stops. This paper describes the first approach to that problem. As a starting point, an ideal situation has been taken: a standardized haul length with no other crossing lines and no congestion. The demand for energy of the bus is defined as a function of the number of bus stops and average speed. For every bus stop the passenger supply is defined as a function of walking distance (i.e. accessibility), population density and the influence of other nearby bus stops. Both functions together make up a model for energy consumption per passenger depending on average distances between bus stops. The model can be elaborated into a practical instrument by relaxation of the assumptions. (Author/TRRL) [Dutch]

Colloquium Vervoersplanologisch Speurwerk Colloquium 1982, 1983, pp 705-734, 17 Fig., 2 Tab., 17 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 270695), Institute for Road Safety Research SWOV  
 ORDER FROM: Colloquium Vervoersplanologisch Speurwerk, P.O. Box 45, Delft, Netherlands

**21 380862**  
**OPTIMIZATION OF FIXED ROUTE PUBLIC TRANSPORT**  
**SYSTEMS [OPTIMALISATIE VAN LIJNGEBONDEN**  
**OPENBAAR VERVOER SYSTEMEN]**

This paper deals with a model which can be used for the design, the planning and the evaluation of an urban public transport system. The model which was developed on the analogy of the Volvo transportation systems model can be subdivided into three parts: (1) concentration of traffic flows (2) design of routes and assignment of service frequencies (3) evaluation and improvement of the public transport system. The spatial distribution pattern of people and working places, several socio-economic data and the road network are the main input data. Operational, financial and users' constraints can also be taken into account. The output of the model consists of a public transport network with routes, frequencies, vehicle use and a fair amount of evaluation criteria. The results of some computations with the model are presented using a test network. (Author/TRRL) [Dutch]

Immers, LH (Delft University of Technology, Netherlands); Barkey, P (Dienst Verkeerskunde); Hamerslag, R (Delft University of Technology, Netherlands)  
 Colloquium Vervoersplanologisch Speurwerk Colloquium 1982, 1983, pp 735-768, 8 Fig., 1 Tab., 18 Ref.



ACKNOWLEDGMENT: TRRL (IRRD 270696), Institute for Road Safety Research SWOV

ORDER FROM: Colloquium Vervoersplanologisch Speurwerk, P.O. Box 45, Delft, Netherlands

21 381012

**COMPUTERIZED/RUN CUTTING—PHASE III. FINAL REPORT FOR PROJECT**

This project, third phase of CTA's quest to use computerized run cutting routinely, involves six areas—user training, additional implementation, software support, software enhancements, production system support, and consideration of other systems. In user training, schedule-makers were introduced to fundamentals of computerized run cutting. During 1981-1982, 18 run cuts done by computer were successfully put on the street. Software support was given by Sage Consultants in fine-tuning the software and a revised user's manual was produced. Three software enhancements adopted were automatic plot of left-over pieces, automatic save of run cut after each step and display of information about the relief point on the screen. Production system documentation was drawn up, including information about Computerized Run Cutting System (CRCS) from a technical standpoint, giving CTA data processing forces an overview of the process. One other use of computer software—the minischeduler—was considered but a decision was deferred.

Chicago Transit Authority, Urban Mass Transportation Administration Final Rpt. Mar. 1983, 9p Contract IL-09-0055

ORDER FROM: Chicago Transit Authority, Merchandise Mart Plaza, P.O. Box 3555, Chicago, Illinois, 60654

21 381430

**MULTIPLE-OBJECTIVE PLANNING FOR BUS OPERATION: A CASE STUDY FOR TAIPEI CITY**

An important objective of bus operation from the passengers' viewpoints, is to raise the level of service to meet their needs. From the operators' viewpoints, the objective is to reduce the cost and get more profit. It is evident that the objectives of their two concerns are often conflicting. Therefore, the government should play an important role in finding an unbiased strategy to reduce this conflict to a minimum extent. A multi-objective utility function is established which is composed of six factors of the passengers' concerns, including riding time, waiting time, degree of crowdedness, transferring time, standing probability and walking time, and two major factors of the operators' concerns, including cost and profit items. By using the multiple-objective programming technique, a series of optimums are found. The application of this technique to Taipei city bus system is also presented (A). The number of the covering abstract of the conference is IRRD no 266527.

Proceedings of the Fourth Conference of the Road Engineering Association of Asia and Australasia.

Gwo-hshiung, RCS (National Chiao Tung University, Taipei)  
Road Engineering Association of Asia & Australasia Proceeding Aug. 1983, pp 49-82, 3 Fig., 8 Tab., 5 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 266531), Australian Road Research Board

ORDER FROM: Australian Road Research Board, P.O. Box 156, Bag 4, Nunawading, Victoria 3131, Australia

21 381431

**A MODEL TO OPTIMIZE INTERSTATION SPACINGS OF URBAN RAIL RAPID TRANSIT SYSTEMS**

An analytical model for determining the optimal station spacings of the RRT system developed by using differential calculus method is presented. Specific cost functions are established for both users and operators in building the model. The model is to find the optimal interstation spacing so that the total social cost is minimized. The results of sensitivity analysis show that the optimal station spacing is more sensitive to some factors such as passenger out-of-vehicle travel time, daily passenger demand, route length and stationing cost but less sensitive to others. In addition, it is found that the effects of out-of-vehicle travel time is more significant than that of in-vehicle travel time. This implies that the transit users are reluctant to walk long distances to use transit. Hence in determining station sites a convenient access to the station should be provided. The number of the covering abstract of the conference is IRRD no 266527.

Proceedings of the Fourth Conference of the Road Engineering Association of Asia and Australasia.

Wuu-wang, AK Chia-juch AK, D (National Chiao Tung University, Taipei)

Road Engineering Association of Asia & Australasia Aug. 1983, pp 109-120, 5 Fig., 2 Tab., 10 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 266549), Australian Road Research Board

ORDER FROM: Australian Road Research Board, P.O. Box 156, Bag 4, Nunawading, Victoria 3131, Australia

21 381467

**CHANGING OBJECTIVES FOR AMERICAN TRANSIT. PART 2. MANAGEMENT'S RESPONSE TO HARD TIMES**

Changing economic conditions facing American transit since World War II are reviewed and strategies for coping with current problems are analysed. The most critical issues are financial. The cost of producing transit has been rising at about twice the rate of inflation, while local, state and federal assistance has begun to taper off after a dramatic increase in the early 1970s. Management's response to hard times is analysed: transit performance is being monitored more critically; peak-period alternatives to regular transit are being implemented and new fare structures which are more effective and equitable are being introduced. Strategies are integrated into a budget-based, financial planning cycle in which capital acquisitions and service deployment are related to anticipated revenues. Part 1, IRRD abstract no 270213, reviewed the changing objectives between 1950 and 1980. Part 2 outlines management's response to the need for improved efficiency. (TRRL)

Fielding, GJ *Transport Reviews* Vol. 3 No. 4, Oct. 1983, pp 341-362, 1 Fig., 1 Tab., 56 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272583)

ORDER FROM: Taylor and Francis Limited, 4 John Street, London WC1N 2ET, England

21 381472

**MANAGING PUBLIC TRANSPORT. SYMPOSIUM HELD AT THE UNIVERSITY OF NEWCASTLE UPON TYNE, APRIL 6-8 1976**

The proceedings contain the following papers: Local government objectives in the management of public transport (Awdas, D); The involvement of trade unions in the provision of bus services (Green, JH); Information for management in a public transport undertaking (Hargreaves, JB); Research Requirements—is management getting what it wants? (Cohen, NV); Realities of management in passenger transport areas—an NBC manager's experience (King, BR); Realities of management in passenger transport areas—the viewpoint of BR (Woodruff, JG); Realities of management in passenger transport areas—the views of a passenger transport executive (McKay, AF); Passenger information—principles and practice (Madgett, JS). A discussion on the paper is appended at the end of each report. (TRRL)

Awdas, D (Devon County Council); Green, JH (Transport and General Workers' Union); Hargreaves, JB (Midland Red Omnibus Co); Cohen, NV (London Transport Executive); King, BR (Ribble Motor Services Limited); Woodruff, JG (British Rail); McKay, AF (Greater Glasgow Passenger Transport Executive); Madgett, JS (Eastern Counties Omnibus Company Limited)  
Newcastle upon Tyne University, England Monograph No Date, 80p, Figs., Tabs., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 272635)

ORDER FROM: Newcastle upon Tyne University, England, Department of Civil Engineering, Division of Transport Eng, Newcastle NE1 7RU, Tyne and Wear, England

21 381478

**A MASS TRANSIT PRODUCT FOR THE 80'S**

The article discusses ways in which a product can appeal to a wide range of markets. The reasons why this did not happen in the early 1960's in response to the growth of the private car are investigated when only temporary relief to the decline of public transport was produced by service cuts and increased fares. It is suggested that modern products can be influenced more by physical characteristics, capacities and capabilities than market needs. The choice of mode must be determined by the level of projected sales. Differences between bus and rail transit systems are

examined; buses have less appeal because they have no obvious fixed route and can sometimes be regarded as a "poor-man's car". A flexible system is needed along corridors without expensive tracks, the train corridor lines need the highest frequency with principal boarding points at "park and ride" sites often using shopping centre parking areas. Lines feeding the main trunk should include a subsidiary circular/main line acting as a feeder but attractive enough to create some traffic of its own. Provisions should be made for extension of the main trunk line. Other feeder services should only be provided as necessary to maintain the viability of the main service. (TRRL)

Surveyor Vol. 162 No. 4755, Aug. 1983, pp 12-14, 4 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272853)

ORDER FROM: Business Press International Limited, Surrey House, 1 Throley Way, Sutton, Surrey SM1 4QQ, England

21 381592

#### RIGHT BALANCE BETWEEN SERVICE FREQUENCY AND TRAIN SET IN RAILWAY PASSENGER TRANSPORT

In railway transport the selection of service frequency (number of trains operated) is a problem no less important than the speedup of train operation. Adequate service frequency to handle a given traffic volume, i.e. the right balance between service frequency and train set, is discussed from a cost-benefit standpoint. Calculation of adequate service frequency is formulated and the values thus calculated are compared with the actual situation of passenger transport by the Japanese National Railways and private railways of the Tokyo Metropolitan zone and the Keihanshin zone. The necessity for a macroscopic approach to the cutting back on train time is stressed. A revised passenger fare sale is proposed and the relation between train speed and cost-benefit is considered.

Miyata, H *Railway Technical Research Inst, Quarterly Reports Vol. 24 No. 1, Mar. 1983, pp 42-45*

ACKNOWLEDGMENT: EI

ORDER FROM: ESL

21 381677

#### THE COVENTRY BUS STUDY

The West Midlands Passenger Transport Executive commissioned Martin and Voorhees Associates (MVA) and Volvo Transportation Systems to carry out a study of the bus system in Coventry using the computer-aided network planning techniques developed by Volvo Transportation Systems. The study was the first in Britain to use these techniques. The objectives of the study were not only to develop a more cost-effective bus network for Coventry, but also to enable WMPTE to obtain direct experience of planning techniques with a view to including them in the PTE's continuing programme of network reviews and area reshaping studies throughout the West Midlands. Phase 1 consisted of the evaluation of the existing Coventry bus network. The principal elements of phase 1 were: (I) the collection and analysis of data on existing travel by public transport in Coventry; (II) representing the existing public transport system (the "base network") on the computer; (III) loading ("assigning") the passenger trips on to the computer representation of the base network using the passenger assignment and network evaluation program—the route network analysis or rna; (IV) analysing the performance of the base network using the data provided by the rna on passenger loadings, the standard of travel, costs and revenue, together with various manual analyses. An important element of phase 1 was to demonstrate that the rna could reproduce accurately the loadings on the present network. Phase 2 consisted of the development and evaluation of various network options for Coventry and the preparation and optimisation of a recommended plan. Two approaches to network design were used in the study. The first consisted of the manual generation of two alternative networks. The design of these networks was guided by the evaluation of the base network, together with the local knowledge of pte officers. The second approach involved the generation of a route network by the computer. A computer designed network has the advantage of being unconstrained by the existing route network or even the existing pattern of demand, and may thus include ideas that may be overlooked by the operator. The principal input data for the computer designed network (cdn) programs are: (I) zonal land use parameters (population, employment etc) which are used to generate a 'desire' travel pattern; (II) details of the road network suitable for bus operations, and (III) lists of permitted terminal points for buses. The manually designed and computer designed networks were then evaluated using the rna. The final stage consisted of the

development of the plan using computerised optimisation techniques. Alternative policy options were examined including the level of costs and revenues, and the size of the bus fleet. Discussions are currently taking place with a view to the implementation of the preferred network. (TRRL)

Public Transport. Proceedings of Seminar M held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Harris, IDH (Martin and Voorhees Associates); Haywood, PJ (West Midlands Passenger Transport Executive) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 67-81, 5 Fig., 2 Tab.*

ACKNOWLEDGMENT: TRRL (IRRD 272839)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

21 382303

#### ANALYZING TRANSIT TRAVEL TIME PERFORMANCE

A detailed analysis of transit speeds, delays, and dwell times based on surveys conducted in a cross section of U.S. cities is summarized. The relationships and parameters provide inputs for planning service changes and assessing their impacts. The surveys and analyses find that car speeds are consistently 1.4 to 1.6 times as fast as bus speeds; time the typical bus speeds about 48 to 75 percent of its moving, 9 to 25 percent at passenger stops, and 12 to 26 percent in traffic delays; and peak-hour bus travel times approximate 4.2 min/mile in suburbs, 6.0 in the city, and 11.50 in the central business district. Bus dwell times (including door opening and closing) approximate 5 sec plus 2.75 times the number of passenger; during peak hours local buses stop at 68 to 78 percent of the designated stops. Bus travel times and speeds were derived as a function of stop frequency, stop duration, and bus acceleration and deceleration times observed in the field. Reducing bus stops from eight to six per mile and dwell times from 20 to 15 sec would reduce travel times from 6 to 4.3 min/mile, a time saving greater than that which could be achieved by eliminating traffic congestion. Transit performance should be improved by keeping the number of stopping places to a minimum. Fare-collection policies and door configurations and widths are important in reducing dwell time, especially along high-density routes. Such time savings will likely exceed those achieved from providing bus priority measures or improving traffic flow.

This paper appeared in Transportation Research Record No. 915, Urban Buses: Planning and Operations.

Levinson, HS (Connecticut University, Storrs) *Transportation Research Record No. 915, 1983, pp 1-6, 3 Fig., 9 Tab., 13 Ref.*

ORDER FROM: TRB Publications Off DOTL JC

21 382304

#### MODELING BUS DELAYS DUE TO PASSENGER BOARDINGS AND ALIGHTINGS

Two causes of bus delay are examined: the delay from the stopping and starting at passenger stops dwell time as the passengers board and alight from the bus. Evaluation of data on the number of passengers boarding and alighting at stops along a route showed that the negative binomial is a good descriptor of this distribution. Additional data were used to determine dwell time per passenger as a function of the passenger boardings and alightings. By using these intermediate results, a procedure was developed to determine the resulting bus delay and its effect on operating speed, ridership, and ultimately on route performance. This methodology was then tested with data from Milwaukee, Wisconsin.

This paper appeared in Transportation Research Record No. 915, Urban Buses: Planning and Operations.

Guenther, RP (Marquette University); Sinha, KC (Purdue University) *Transportation Research Record No. 915, 1983, pp 7-13, 10 Tab., 4 Ref.*

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21 382317

#### A METHODOLOGY FOR ESTIMATING EXPECTED FIXED-ROUTE BUS SERVICE LEVELS

The Transit Access and Regional Development (TARD) service algorithm and its socioeconomic data base are used for bus route analysis by the Northeastern Illinois Planning commission. Theory behind the TARD algorithm is that higher development densities can be expected to generate greater transit demand than lower development densities, and this relationship should be reflected in provision of more transit service in

higher density areas. Level of transit service is established for each quarter section of the area under study. Population and employment levels are combined with transit service characteristics to analyze distribution of services, identify areas where marginal service changes may be appropriate and determine whether counties in the Regional Transit Authority district have equivalent service. With receipt of 1980 Census information, variables such as income, ethnicity, unemployment rate, labor force participation rate and auto ownership will be included in the model. After its refinement in suburban areas, it is expected that the TARD model will be used to evaluate service in the City of Chicago.

Jarzab, JT Metalitz, C (Northeastern Illinois Planning Commission)  
**Transportation Quarterly** Vol. 37 No. 4, Oct. 1983, pp 583-596

ORDER FROM: Eno Foundation for Transportation, Incorporated,  
 P.O. Box 55, Saugatuck Station, Westport, Connecticut, 06880

**21 382323**  
**THE MANAGEMENT PLAN OF THE SOCIETE NATIONALE DES CHEMINS DE FER VICINAUX**

As a major public transit operator in Belgium with both streetcar and bus services, major management goals are controlling operating expenses and increasing revenues. Studies identified the factors which influence the various expense items and the criteria for providing attractive service. Factors studied included the physical and operating characteristics of the routes, the vehicle speeds, the operating speed, frequency of service, waiting times, capacity and performance of vehicles, level of occupancy, power consumption, utilization of vehicles and other equipment, and characteristics of each maintenance operation. Computer applications for the various management areas are explained.

Henrard, C Pourveur, G **UITP Revue** Vol. 32 No. 3, 1983, pp 239-243

ORDER FROM: International Union of Public Transport, Avenue de l'Uruguay 19, B-1050 Brussels, Belgium

**21 382581**  
**REDUCTION OF PEAK-POWER DEMAND FOR ELECTRIC RAIL TRANSIT SYSTEMS**

Rail transit managers will find this report useful in assessing operation of their electrified systems. Energy cost reduction guidelines contain step-by-step procedures for energy load management by reducing peak power demand. Factors contributing to peak power demand were identified, energy use patterns were identified, and policies were examined. Data was collected and analyzed for four transit agencies so that the sensitivity of factors influencing power demand could be determined by using the Energy Management Model (EMM), a series of computer simulation programs. General findings were: (1) Reduction of peak-power demand in electric rate structures can be cost effective for transit agencies; (2) Costs and benefits of load management are site-specific; (3) Load management should be part of an overall energy management effort. Vehicle-performance modifications such as top-speed limits and coasting can produce immediate savings. More sophisticated strategies may be desirable for optimum cost reduction. As load management reduces peak demand, utility cost allocations are shifted to other customers and careful negotiation will be necessary to avoid higher rates in future years.

Uher, RA Sathi, N (Carnegie-Mellon University) **NCTRP Report**  
 No. 3, Dec. 1983, 142p, Figs., Tabs.

ORDER FROM: TRB Publications Off

**21 382620**  
**BUS ALLOCATION WITH TIME DEPENDENT CONDITIONS CONSIDERING CROWDING**

This report addresses a central element in the short range planning of all transit properties—the determination of the frequency of service on each route during each period of the day. Frequency of service is a basic determinant not only of the quality of service offered to passengers in terms of waiting times and level of comfort (probability of obtaining a seat or standing room per passenger), but also of the operating costs. The problem of setting frequencies of a transit network under deterministic conditions with time varying demand for service and operating costs, is formulated as a mathematical programming problem. The objective of the research described in this report is to develop a more realistic mathematical representation of the frequency determination problem than those previous-

ly proposed and to develop and test solution procedures. In this report, an optimization model is presented, and a solution method demonstrated which incorporates the following three important problem attributes: 1) the key input data—demand for service, operating costs, and travel times—are all time dependent; 2) passengers' costs are expressed not only in terms of waiting times, as in previous models, but also in terms of the inconvenience caused to passengers by crowding on the vehicles; and 3) realistic operating constraints on subsidy, vehicle fleet size, and vehicle capacity are incorporated. A simplification of the initial complicated formulation is proposed dividing the period of interest into subperiods during which headways are constant. The problem can then be solved efficiently using linear programming. The report points out that while the model presented in this report clearly represents an advance in fully describing the important factors which should affect the setting of bus service frequencies, it has not been possible to apply it to a real system and more research of the type described is necessary on the frequency and timetable development portions of the process.

Koutsopoulos, HN Wilson, NHM  
 Massachusetts Institute of Technology, Urban Mass Transportation Administration Final Rpt. UMTA-MA-11-0035-83-1, Oct. 1983, 74p Contract MA-11-0035  
 ORDER FROM: NTIS PB84-140425

**21 382639**  
**ENERGY SAVINGS BY COASTING IN TRANSIT SYSTEMS**

In view of the ever-increasing cost of energy, savings are important. It is shown that considerable savings without any significant lengthening of journey time are possible also for conventional motive power units. The effect of the parameters of maximum speed and length of coast are investigated. [German]

Hochbruck, H **Glaser's Annalen ZEV** Vol. 107 No. 12, Dec. 1983, pp 417-420

ACKNOWLEDGMENT: British Railways  
 ORDER FROM: ESL

**21 382718**  
**NOTES ON THE THEORETICAL DYNAMICS OF INTERMITTENT PUBLIC PASSENGER TRANSPORTATION SYSTEMS**

This review paper examines the state of the art on the dynamics of vehicle pairing on bus, rapid-transit and elevator systems. Through examination of the limitations of analytic models of pairing, a description is developed of the dynamic interactions that produce vehicle pairing. Empirical evidence is presented to suggest that variability in vehicle journey time is a contributory factor. An evaluation of the consequences of pairing for passengers concludes that experiments investigating regulation of pairing should not only monitor passenger waiting times, but also measure passenger journey times and the degree of interdependence between these trip time components. (Author/TRRL)

Boyd, CW (Saskatchewan University, Canada) **Transportation Research. Part A: General** Vol. 17A No. 5, Sept. 1983, pp 347-354, 1 Fig., 3 Tab., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 273585)  
 ORDER FROM: ESL

**21 382735**  
**RECOMMENDATIONS ABOUT COLLECTING BUS HEADWAY DATA AND ESTIMATING EXPECTED WAITING TIMES**

The time headways between successive buses seen by an observer at a bus stop are considered. The equation relating the waiting time (w) to the mean and standard deviations of headways ( $\mu$  and  $\sigma$ ) is said to have serious limitations if the time interval between the first and last buses becomes small because the value of  $\sigma$ ,  $\mu$  and  $w$  also becomes smaller. It is felt that a better measure of the quality of service than  $w$  would be a measure (eg the standard deviation) of the day to day variability of bus arrival times. Several alternative methods of calculating  $w$  from a single observation period are described and simulations have been carried out using these methods in an attempt to demonstrate which method is the most applicable. The results of the simulation of 3 buses scheduled per hour are shown in tabular form and reasons for selecting one method in preference to another are given. (Author/TRRL)

Hutchinson, TP (Coventry Polytechnic, Lanchester); Nicholl, JP (Sheffield University, England) **Traffic Engineering and Control** Vol. 24 No. 11, Nov. 1983, pp 529-531, 1 Tab., 8 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272625)  
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### 21 382765

#### THE CROYDON AREA ROUTE NETWORK STUDY

Recent fares revisions and the introduction of suburban flat fares and zonal fares have affected the pattern of demand for bus services in London. It is recognised that there is a need to study how demand on the network has changed and to determine the most appropriate provisions of bus services, in both time and network coverage, to meet that demand. In response to this need, a trial study is underway in the Croydon area. During the study a large-scale passenger survey was conducted as a foundation for the application of the computer-based route network analysis and design system. The system consists of a set of computer programs of which the most important being applied in Croydon are:-route network analysis;-computer designed network;-route linking;-frequency optimisation. The primary objective of the study is to evaluate how effective current bus services in Croydon are in meeting the existing pattern and level of demand and to recommend any changes in the route structure or service frequencies to bring about improvements. It is also intended to assess the value of a computer-based planning system as a service planning aid for London Transport. Results from the study are expected in April 1983 and the paper will describe these and present the conclusions drawn from them. (Author/TRRL)

Public Transport Planning and Operation. Proceedings of Seminar L held at the PTRC 11th Summer Annual Meeting.

Last, A (Mva Consultancy); Fuggles, M (London Transport Executive) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc** 1983, pp 155-170, 5 Fig., 3 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 273507)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England SEEB8310613

### 21 382766

#### THE MANAGEMENT STUDY APPROACH FOR EFFECTING PUBLIC TRANSPORT IMPROVEMENT

No approach is better known or more controversial than hiring outside management consultants to effect change. Management consulting has been extensively used in private industry for more than five decades in the US. However, the application of management consulting assistance to public transport has been less widespread, and has often been limited to specialised services on organisation issues or major strategic decisions. The management study approach presented in this paper is comprehensive in approach and recognises that significant improvement can only be achieved by a coordinated programme of changes in a wide range of functions within the public transport operator. It is a process that relies heavily on the active and positive participation of the public transport management staff. The management consultants act as "agents for change" or "catalysts" within the existing organisation. The application of these experienced public transport consultants is best applied through a two-stage programme. Stage I of the programme is designed to comprehensively overview the public transport operator's functions. Its best analogue is a diagnostic survey in which "no stone is left unturned". Unlike the stage I diagnostic, the stage II work is implementation, that is real-world improvements in operating cost effectiveness and efficiency. Examples of these implementation achievements are provided within this paper in case study format from our recent West Yorkshire, Chicago, and other management studies. A series of case study examples are provided in the paper to illustrate the achievements possible under the management study approach. These case studies include changes to fares structure, service level and route configuration changes, and management information improvements. These case studies illustrate how the two stage approach of diagnostic and implementation supports the ordered and effective implementation of improvement within public transport agencies. (Author/TRRL)

Public Transport Planning and Operation. Proceedings of Seminar L held at the PTRC 11th Summer Annual Meeting.

Steinmetz, WR (Booz-Allen and Hamilton, Incorporated) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc** 1983, pp 145-153, 1 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 273506)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

### 21 382789

#### A QUEUEING SYSTEM FOR AIRPORT BUSES

The use of remote terminals to relieve airport congestion leads rather naturally to queueing systems with batch arrivals occurring at fixed time intervals to a multiple server service facility. In this paper arrival point steady-state solutions to queueing system are presented. Solution of the steady-state equation  $w_p = w$  and Neuts' method of solving the above system are used to obtain steady-state system size densities. Results obtained using the two methods are compared with each other as well as with simulation results. (Author/TRRL)

Selvi, A (Armco, Baltimore); Rosenshine, M (Pennsylvania State University, University Park) **Transportation Research. Part B: Methodological** Vol. 17B No. 6, Dec. 1983, pp 427-434, 1 Tab., 11 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273764)  
ORDER FROM: ESL

### 21 382887

#### MORE ATTRACTIVE PUBLIC TRANSPORT: LESS TRANSFERRING WHEN THERE ARE TWO LINES ON ONE BRANCH [EEN AANTREKKELIJK OPENBAAR VERVOER, DOOR MIDDEL VAN TWEE LIJNEN PER TAK]

With the intention of decreasing the number of passengers changing from one line on to another a study has been carried out into possibilities of two lines per branch of the public transport network in The Hague. The research led to a design for the public transport network in The Hague having in general more than one line per branch. In the network designed there are more than 50 per cent fewer passengers needing to change, together with an increase in the number of passengers by 13 per cent, in comparison with a network using the same infrastructure but with only one line per branch. (TRRL) [Dutch]

Conference Papers of the Working Days on Traffic Engineering 1983.

Kohsiek, HW (Delft University of Technology, Netherlands); Dehsiek, HWN **Bijdragen Verkeerskundige Werkdagen 1983** Apr. 1983, pp 255-266, 1 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 272699), Institute for Road Safety Research SWOV  
ORDER FROM: Werkdagcommissie, P.O. Box 163, Driebergen-rijnsbur, Netherlands

### 21 382888

#### PUBLIC TRANSPORT SYSTEM ANALYSIS. THERE IS NO NEED TO AVOID A CHANGE [SYSTEMBOUW OPENBAAR VERVOER. VLUCHTEN VOOR DE OVERSTAP HOEFT NIET]

The necessary integration of private and public transport results in a hierarchical set-up of public transport systems. Such a hierarchical set-up of a public transport system leads to many social benefits, not in the least in the area of control of costs. Apparently passengers do not benefit from the hierarchical set-up because they will have to change more times. However, after a closer look it can be learned that other elements of a trip will be of a better quality in such way that the negative element will disappear and the change can even have a positive influence on the quality of the total trip. (Author/TRRL) [Dutch]

Conference Papers of the Working Days on Traffic Engineering 1983.

Schoemaker, TJH (Delft University of Technology, Netherlands); Dehoemaker, **Bijdragen Verkeerskundige Werkdagen 1983** Apr. 1983, pp 267-274, 6 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272700), Institute for Road Safety Research SWOV  
ORDER FROM: Werkdagcommissie, P.O. Box 163, Driebergen-rijnsbur, Netherlands

**21 382893**

**THE EFFECTS OF REGULARITY CONTROL IN PUBLIC TRANSPORT ON THE VARIATION IN THE DEGREES OF OCCUPATION OF TRAMS AND BUSES [HET EFFECT VAN REGELMAATSBEVORDERING OP DE VOERTUIGBEZETTING IN HET STEDELIJK KOLLEKTIEF OPENBAAR VERVOER]**

The service rendered to the passengers of public transport, and the efficiency of the conduct of business of the transportation company is worsened by an unequal spread of passengers over the trams or buses. In this study the effects on the spread are quantified for different variations in passenger demand and for various degrees of irregularity in the service executed. A case study showed that an irregular service greatly affects the variation in occupancy of streetcars. A service with a proportional irregularity of 50 per cent needs 75 per cent more public transport vehicles than a regular service to satisfy the same standard of service. The additional effect of variations in passenger demand on the variation in occupancy seems to be marginal. (TRRL) [Dutch]

Conference Papers of the Working Days on Traffic Engineering 1983.

Hakkesteegt, P Muller, THJ (Delft University of Technology, Netherlands) *Bijdragen Verkeerskundige Werkdagen 1983* Apr. 1983, pp 327-339, 7 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 272705), Institute for Road Safety Research SWOV

ORDER FROM: Werkdagcommissie, P.O. Box 163, Driebergen-rijnsbur, Netherlands

**21 384611**

**DESIGN CRITERIA FOR URBAN PUBLIC TRANSPORT LINES. THE EXPERIENCE OF A.T.M., MILAN [CRITERI DI PROGETTAZIONE DELLE LINEE URBANE DI PUBBLICO TRASPORTO. L'ESPERIENZA DELL A.T.M., MILANO]**

Once the structure of a public transport network has been defined from origin-destination studies, the itineraries of the various lines must be planned in terms of the existing road and traffic situation. After a critical examination (using a computer based traffic simulation model) of public transport priority layouts in the Milan road network, the author formulates some practical micro-design criteria (lane capacity, bus trajectories on curves, bus stop location, terminus design) and makes some suggestions regarding daily highway and traffic operations. (TRRL) [Italian]

Decio, B (A.T.M., MILANO) *Vie e Trasporti* Vol. 52 No. 503, June 1983, pp 387-414, 18 Fig., 28 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 274927)

ORDER FROM: Casa Editrice la Fiaccola, Via Ravizza 62, Milan, Italy

**21 384619**

**THE PLANNING OF URBAN BUS ROUTES AND FREQUENCIES : A SURVEY**

Urban bus services still play an important role in the movement of people in Britain, although since the 1950's bus patronage has been declining and costs of operation have been increasing. Most of the urban bus networks in Britain (and to a very large extent the western world) have developed or evolved over the years and it is sometimes said that, despite the changing conditions of bus transport, few of these bus networks in Britain have undergone major re-organisation. A survey was carried out to ascertain this view and to establish the approaches used by British urban bus operators. Five approaches to the planning of urban bus routes and frequencies have been identified: (1) manual; (2) market analysis project; (3) systems analysis; (4) systems analysis with interactive graphics; and (5) mathematical. Previous research in, and application of, the different approaches are described and examined. Between 1970 and 1980, 82.4% of those British urban operators who responded to the survey carried out some kind of major bus study. The survey results run counter to the view that there has been little recent change in urban bus networks in Britain, but the alleged conservatism of the bus industry appears when the approaches used for re-planning bus services are examined-71.4% of the operators used a manual approach and only a meagre 28.6% made use of simple assignment techniques to predict the potential passenger impacts of the alternative networks appraised. (Author/TRRL)

Tiongl, CE (Newcastle upon Tyne University, England)

*Transportation (Netherlands)* Vol. 12 No. 2, Jan. 1984, pp 147-172, 5 Fig., 5 Tab., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 274930)

ORDER FROM: Elsevier Scientific Publishing Company, P.O. Box 211, 1000 AE Amsterdam, Netherlands

**21 384643**

**IMPROVED INFORMATION ON TRAIN RUNNING [LE INFORMAZIONI ARRICCHITE SULLA CIRCOLAZIONE DEI TRENI]**

Information is a decisive factor in case of traffic disruption: accurate, fast and complete information makes it easier to take the necessary measures for restoring normal operating conditions. Better information therefore contributes to increased line throughput. Presentation of improved information system: CCF (Control of train running), TD (train describer), IST (Train sequence monitoring system) and ATN (Digital train announcing). [Italian]

Augelli, R Bonaccorsi, A *Tecnica Professionale* No. 7, July 1983, pp 394-398, 7 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: Collegio Ingegneri Ferroviari Italiani, Via Giolitti 34, Rome, Italy

**21 384889**

**PREPARATION OF TRAIN SCHEDULES [ELABORATION ET TRACE DES HORAIRES]**

This article presents the way in which train schedules are prepared on the SNCF. At the request of a "transport planning manager" for a train path, timetable specialists determine first the journey time to be planned for each part of the train journey, then an accurate train schedule for that train, to include it later in the graph. Indications are then given on the way in which changes of locomotive or variations in tonnage are dealt with. Two paragraphs are devoted, respectively, to the present developments in the field of energy-saving running methods (ACE running) and to future computerised running presently under study (Athos study). [French]

Quinchon, C *Revue Generale des Chemins de Fer* Oct. 1983, pp 607-616, 1 Tab., 5 Phot., 1 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD

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**21 384899**

**BUS ROUTE DEMAND MODELS: CLEVELAND PROTOTYPE STUDY**

The Greater Cleveland Regional Transit Authority's prototype Bus Patronage Estimation Study was initiated to develop techniques for the estimation of changes in bus service patronage at the individual route level. The techniques are designed to be accurate within acceptable tolerance limits, responsive to local conditions, capable of utilizing existing local data, and operable by the Authority's in-house staff.

Krechmer, D Lantos, G

SG Associates, Incorporated, National Highway Traffic Safety Administration, Office of the Secretary of Transportation Final Rpt. UMTA-OH-09-7002-83, DOT-I-83-34, Aug. 1983, 119p Contract UMTA-OH-09-7002

ORDER FROM: NTIS PB84-143288

**21 384915**

**COMPARATIVE EVALUATION OF ENERGY MANAGEMENT MODELS FOR TRANSIT SYSTEMS**

The energy consumption of BART transit cars was measured with and without regeneration during the period 25 August-2 September 1981. The test data was then compared with the predictions of different energy management models currently in use for transit system studies. This report presents the results of this comparative evaluation of these models. The test plan, the instrumentation plan, the data reduction requirement, and the test data are first presented. Different energy management models are then discussed and the respective predictions are compared with the test data. Finally, the input data used by the models including the BART system and vehicle parameters, the operating conditions during test runs, etc., are detailed in separate Appendices A through D.

Nene, VD

Transtech International Incorporated, Urban Mass Transportation Administration, (DTS-66) Final Rpt. UMTAMA-06-0025-83-12, DOT-TSC-UMTA-83-52, Feb. 1984, 430p, Figs., Tabs., 4 App. Contract DTRS-57-83P-80292

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**21 385267**

**IMPLICATIONS OF TROLLEY BUS INSTALLATIONS**

Issues of economics, the environment, system design, and operations that relate to applications of the trolley bus modes are dealt with. Trolley bus systems are shown to be attractive for applications in which fuel considerations, environmental concerns, topographical factors, and ridership are of primary importance. These elements, coupled with technological developments, are prompting renewed interest by urban planning and transit officials in the trolley bus mode.

This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Transportation Research Board Special Report No. 200, 1983, pp 23-24

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**21 385270**

**TROLLEY BUS OPERATIONS**

L. Lawrence, Director of Operations for the Edmonton Transit System gives a status report on trolley bus operations and stresses the importance

of using the trolley bus for heavily serviced areas such as city trunk routes. He also identifies the concept of teamwork as a requirement of successful trolley operation.

This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Lawrence, LA Transportation Research Board Special Report No. 200, 1983, pp 31-33

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**21 385271**

**THE TROLLEY BUS AND SYSTEM DESIGN**

In this paper, Thomas G. Matoff, Director of Transit Development for the Tri-County Metropolitan Transportation District of Oregon (Tri-Met), Portland views the design of the transit network as the basis for successful introduction of trolley coach operation in most American cities.

This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Matoff, TG Transportation Research Board Special Report No. 200, 1983, pp 34-40, 2 Fig., 17 Ref.

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22 380133

**BUS MAINTENANCE IMPROVEMENT**

This report contains proceedings of the Bus Maintenance Improvement Workshop held April 14-16, 1982 in St. Louis. The workshop was to exchange information on current transit industry practices related to bus maintenance, to define industry needs, and to generate suggestions for research, development and technical assistance programs in the maintenance areas. Five topics focused the discussion of maintenance needs: Management's role; management tools for improving maintenance; human resources; facility and equipment needs; vehicle design, testing and maintenance support services. Each of the topics was addressed by issue and resource papers. Subsequently the five working groups discussed the state of the art in their areas and ranked suggestions for development and technical assistance. While the working groups had distinct topics, many of the problems identified and discussed crossed the boundaries of the individual working groups.

Proceedings of the Bus Maintenance Improvement Workshop, April 14-16, 1982, St. Louis, Missouri.

Transportation Research Board Special Report No. 198, 1983, 59p, Figs., Tabs., Refs., 1 App.

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22 380134

**MAINTENANCE RESEARCH AND DEVELOPMENT NEEDS IN THE TRANSIT INDUSTRY**

It was observed that an appropriate bus maintenance research and development program must not only recognize the state of the art, but also the state of the transit industry. The goal should be long-lived, more reliable, and more easily maintained equipment that at the same time removes human judgement from the maintenance process and is self monitoring and self-diagnosing. A standard diagnostic system for buses is needed. While maintenance management information systems have been developed, the industry has made little use of the output in establishing the service life of components and identifying critical product improvement needs. There is also need not only to build failure rates into local information systems, but also to develop the means for identifying problems on an industry-wide basis. Direction and control of any R&D programs in these areas should come out of the industry and not the federal government. Federal involvement must not impede R&D and development of new systems for the industry. Manufacturers and operating agencies need to share a reasonable part of the financial burden of R&D.

This paper appeared in Transportation Research Board Special Report 198: Bus Maintenance Improvement; Proceedings of the Bus Maintenance Improvement Workshop April 14-16, 1982, St. Louis, Missouri.

Heinle, GW (New Jersey Transit Corporation) **Transportation Research Board Special Report No. 198, 1983, pp 4-5**

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22 380135

**MASS TRANSIT: A PERSPECTIVE FOR THE FUTURE**

After 15 years of federal funding, the author feels that transit management may have become overly reliant on external financial resources rather than controlling costs. Increased efficiency, performance and productivity in established maintenance functions are necessary. Transit has historically been labor intensive with at least 75 percent of operating expenditures going to labor, the major portion of this being bus operator wages. Most of the remainder of labor cost involves the maintenance function. More effective management of maintenance and increased productivity involve the following: Cost control, organization for the maintenance function, supervisor selection and training, management information systems, preventive maintenance, performance indicators, job standards, technical training for maintenance, and absenteeism. Materials, supplies and maintenance equipment must also be carefully managed.

This paper appeared in Transportation Research Board Special Report 198: Bus Maintenance Improvement; Proceedings of the Bus Maintenance Improvement Workshop, April 14-16, 1982, St. Louis, Missouri.

Smith, MM (Denver Regional Transportation District) **Transportation Research Board Special Report No. 198, 1983, pp 5-11, 2 Fig.**

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22 380136

**CHARGE TO THE WORKSHOP**

The transit industry is confronted by a decline in the experience level of maintenance workers with an estimated 50 percent now having 5 years or less of service. Despite large investments in renovating transit equipment and extending transit systems, maintenance problems must still be faced. Two ongoing UMTA demonstrations offer promise for improving maintenance performance. At Detroit DOT, an improved bus maintenance manual format, called the Job Performance Aid (JPA) is being developed and tested. An Automatic Bus Diagnostic System (ABDS) is being developed and tested by New York City Transit Authority. There is a fuel-island ADBS unit which provides a short test of the condition of a bus, checking 15 parameters and recording fuel usage. The maintenance-area ABDS unit gives a comprehensive test to buses that fail the fuel-island test. Questions posed in conclusion: Are we doing enough to support maintenance personnel? Are we providing enough unambiguous technical information and proper tools? Are we collecting sufficient maintenance information?

This paper appeared in Transportation Research Board Special Report 198: Bus Maintenance Improvement; Proceedings of the Bus Maintenance Improvement Workshop, April 14-16, 1982, St. Louis, Missouri.

Hallman, AB (Urban Mass Transportation Administration) **Transportation Research Board Special Report No. 198, 1983, p 12**

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22 380137

**MANAGEMENT'S ROLE IN MAINTENANCE: RESOURCE PAPER**

Policymakers must be aware of bus maintenance problems and enlisted in the long-term solutions to these problems. Procurement policies must be altered so that maintenance costs of transit buses are carefully weighed. Personnel practices must be restructured so that high productivity and high quality craftsmanship are integral parts of the contract between the transit agency and its maintenance personnel. The adversarial nature of labor relations in the industry must be replaced by a mutual concern for vehicle reliability and quality public service. Operations and maintenance personnel must replace mutual hostility and defensiveness with attitudes that reflect understanding and cooperation. UMTA concern with maintenance should focus more precisely on its role as facilitator, information gatherer and disseminator, and supporter of better research and training programs. The role of maintenance managers is to see that these objectives are their objectives and that a major portion of their energy is devoted to achieving these goals.

This paper appeared in Transportation Research Board Special Report 198: Bus Maintenance Improvement; Proceedings of the Bus Maintenance Improvement Workshop, April 14-16, 1982, St. Louis, Missouri.

Mallett, CL (Detroit Department of Transportation) **Transportation Research Board Special Report No. 198, 1983, pp 20-22**

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22 380138

**MANAGEMENT'S ROLE IN MAINTENANCE: WORKSHOP REPORT**

Conditions identified by the management study group as having negative effects on maintenance included: Operations and maintenance managers tend to involve transit boards in day-to-day operations; lack of current and reliable information needed to permit all managers to function effectively; inability of maintenance managers to present meaningful budgets, the result of a lack of skills in this area; absence of appropriate organizational approaches to purchasing; lack of property-level maintenance policies or standards, resulting in failure-based maintenance. The following strategies were recommended to improve management effectiveness: Establish effective R&D in bus maintenance, achieved through joint participation and funding of UMTA, individual properties and manufacturers; development of a relatively uniform maintenance and management reporting system that would be flexible enough to permit property-level adaptations, but should include inventory leveling and performance measurement; need for bus maintenance management courses; preparation of a handbook on maintenance planning and budgeting.

This paper appeared in Transportation Research Board Special Report 198: Bus Maintenance Improvement; Proceedings of the Bus Maintenance Improvement Workshop, April 14-16, 1982, St. Louis, Missouri.

Transportation Research Board Special Report No. 198, 1983, pp 22-24

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22 380139

**MANAGEMENT TOOLS FOR IMPROVING MAINTENANCE PERFORMANCE: RESOURCE PAPER**

Transit maintenance costs nearly \$1.8 billion annually and is increasing at the rate of \$400 million each year. The transit maintenance staff typically constitutes 15 to 20 percent of the work force and represents about 25 percent of total operating costs. Management information systems to date have usually made possible only development of broad generalities concerning maintenance; even more elusive is the cost of not maintaining transit vehicles—deferred maintenance. It is estimated that the current accumulation is a figure far higher than a current year's maintenance expenditures. Deferred maintenance is also the primary contributor to unreliable performance. Cost controls and performance measures involving materials, labor and use of maintenance equipment must be implemented if transit systems are to manage properly their maintenance and inventory operations. A survey of 54 transit properties accounting for approximately 65 percent of the total vehicle fleet in the U.S., showed 28 have automated information systems for fleet maintenance, and 23 are using MIS for materials management and inventory control. Critical to establishment of a general MIS are system environment, system costs, and project commitment. Because U.S. transit systems differ substantially with respect to operation environment, organization and service characteristics, no single performance measure will be universally applicable. Measuring performance of transit maintenance requires realistic goals. The major aims are reduction in system maintenance costs, improved vehicle reliability, and improved maintenance performance.

This paper appeared in Transportation Research Board Special Report 198: Bus Maintenance Improvement; Proceedings of the Bus Maintenance Improvement Workshop, April 14-16, 1982, St. Louis, Missouri.

Kliem, BW Goeddel, DL (Transportation Systems Center)  
Transportation Research Board Special Report No. 198, 1983, pp 25-34, 12 Fig., 1 Tab., 10 Ref.

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22 380140

**MANAGEMENT TOOLS FOR IMPROVING MAINTENANCE PERFORMANCE: WORKSHOP REPORT**

Two general categories of concern emerged: The need to collect historical bus data and the need to develop methods to use the data. Seven specific areas requiring R&D are listed in the order of their importance: Management information systems specifically for maintenance (Preventive maintenance scheduling, inventory control, failure monitoring, work-order processing and status tracking); training programs aiding the transition from manual to computerized maintenance information systems; automated data collection systems for maintenance; a national information network for sharing data on major model-specific bus defects; management tools and information systems that would facilitate the purchase of quality products within a low-bid system; simulation and failure models for bus maintenance that would facilitate maintenance planning; a system for cross-referencing data on the interchangeability of bus parts.

This paper appeared in Transportation Research Board Special Report 198: Bus Maintenance Improvement; Proceedings of the Bus Maintenance Improvement Workshop, April 14-16, 1982, St. Louis, Missouri.

Transportation Research Board Special Report No. 198, 1983, pp 34-36

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22 380168

**VEHICLE MAINTENANCE PRACTICES AMONG 16(B)(2) GRANTEEES**

This report describes the maintenance management practices of a number to transportation providers in Washington State who are funded by UMTA Section 16 (b) (2) program. These providers serve cities of a variety of sizes, and face maintenance problems of varying degrees of complexity. Although these providers are legally mandated to meet the needs of one particular set of special users, the material in this report is probably applicable to many other kinds of systems. Potential users might include specialized transpor-

tation providers for other groups, rural public transportation systems, coordinated human service transportation providers, small urban transit systems, small private providers, and buspools. The document includes both an analysis of maintenance practices, plus a heavy sampling of the actual procedures and forms used by the systems which were contacted. Although these procedures may not precisely meet the needs of other providers, the material hopefully will provide ideas for operators on how to develop new maintenance management procedures or refine those which they already have in place. There is widespread national interest in alternative approaches to transit maintenance, especially for smaller buses.

Feiss, CL

Washington State Department of Transportation, Office of the Secretary of Transportation DOT-I-82-25, Aug. 1981, v.p., 4 Fig., 3 App.

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22 380219

**USING VEHICLE DYNAMICS AS AN AID TO BETTER ROUTE PLANNING FOR LOCAL RAILWAYS**

The normal procedure in planning local transport routes involves frequent changes in the route elements, so that in the event of an unfavourable arrangement the result is excessive vehicle vibration. The article describes a vehicle simulation model which allows repetition of the vehicle vibrations produced by excitations from the route features, and hence allows them to be reduced by effecting route improvements. [German]

Kruse, B Eisenbahntechnische Rundschau Vol. 32 No. 7-8, July 1983, pp 487-490

ACKNOWLEDGMENT: British Railways

ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

22 380789

**COMPUTERIZED CONTROL OF MAINTENANCE OF ELECTRICAL MULTIPLE UNITS**

Modernisation of Brisbane's suburban rail system in recent years is mostly noticeable to laymen in the form of the network's new electric trains. This article looks behind the scene at the important tasks of monitoring the movement and servicing of the rolling stock involved. Queensland Rail's computerised rostering and data storage unit, which can also forecast and schedule carriage maintenance requirements, is described.

Queensland Railways Digest Vol. 17 No. 1, Feb. 1983, p 12

ACKNOWLEDGMENT: ATLAS Bulletin

ORDER FROM: Queensland Railways Digest, Brisbane, Queensland, Australia

22 381031

**MANAGEMENT TOOLS FOR BUS MAINTENANCE—CURRENT PRACTICES AND NEW METHODS. EXECUTIVE SUMMARY**

Management of bus fleet maintenance requires systematic record keeping, management reporting, and work scheduling procedures. Tools for controlling and monitoring routine maintenance activities are in common use. These include defect and fluid consumption reports, work order systems, historical maintenance records, and performance and cost summaries. While these tools are necessary, they are not sufficient for effective maintenance management. Current management methods should be supplemented by strategic planning tools to improve maintenance performance and to control costs. The techniques having the greatest potential for improving the cost-effectiveness of maintenance are work methods analysis and standard job time and cost analysis. Failure history analysis and workload and budget forecasting procedures are also expected to improve strategic planning capabilities. These methods logically lead to the development of maintenance policy testing applications. Most of the data required to implement these methods are captured in current reporting processes, but special attention to maintaining accurate and accessible historical records is essential for use of these methods. This report summarizes current and potential uses of analytical methods in transit maintenance management. It provides an overview of current record keeping practices, identifies a number of newly emerging quantitative techniques, and outlines their potential role in improving the reliability and cost-effectiveness of transit operations. The objectives of this report are to: 1) summarize current maintenance management procedures; 2) identify



gaps between management needs and current decision making aids; 3) survey potentially beneficial analytical tools; 4) assess the data requirements and potential benefits of new approaches to maintenance management. One of the major findings of this report is that maintenance management tools for controlling and monitoring routine daily activities are fairly well developed and have been widely adopted.

Foerster, J Miller, FG Kosinski, M Rueda, A  
 Illinois University, Chicago, Urban Mass Transportation  
 Administration Final Rpt. UMTA-IL-11-0028-83-5, Apr. 1983, 9p

ORDER FROM: NTIS PB83-251108

**22 381032  
 MANAGEMENT TOOLS FOR BUS MAINTENANCE—CURRENT PRACTICES AND NEW METHODS**

The management of bus fleet maintenance requires systematic record keeping, management reporting, and work scheduling procedures. Tools for controlling and monitoring maintenance activities are in common use. These include defect and fluid consumption reports, work order systems, historical maintenance records, and performance and cost summaries. While these tools are necessary, they are not sufficient for effective maintenance management. Current management methods should be supplemented by strategic planning tools to improve maintenance performance and to control costs. The techniques having the greatest potential for improving the cost-effectiveness of maintenance are work methods analysis and standard job time and cost analysis. Failure history analysis and workload and budget forecasting procedures are also expected to improve strategic planning capabilities. These methods logically lead to the development of maintenance policy testing applications. Most of the data required to implement these methods are captured in current reporting processes, but special attention to maintaining accurate and accessible historical records is essential for use of these methods. This report summarizes current and potential uses of analytical methods in transit maintenance management. It provides an overview of current record keeping practices, identifies a number of newly emerging quantitative techniques, and outlines their potential role in improving the reliability and cost-effectiveness of transit operations. The objectives of this report are to: 1) summarize current maintenance management procedures; 2) identify gaps between management needs and current decision-making aids; 3) survey potentially beneficial analytical tools; and 4) assess the data requirements and potential benefits of new approaches to maintenance management. One of the major findings of this report is that maintenance management tools for controlling and monitoring daily activities are fairly well developed and have been widely adopted.

Foerster J Miller, FG Kosinski, M Rueda, A  
 Illinois University, Chicago, Urban Mass Transportation  
 Administration Final Rpt. UMTA-IL-11-0028-83-6, Apr. 1983,  
 n.p. Contract IL-11-0028

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**22 382257  
 ASYMPTOTIC METHOD OF EVALUATING RELIABILITY AND MAINTAINABILITY OF HIGHLY RELIABLE NETWORKS AND ITS APPLICATION**

An asymptotic exponential failure law for an arbitrary redundant repairable system was generally established in a previous paper by the author, involving the decrease of unit unavailabilities to 0, without assuming exponential life/repair distributions of the units. In the present paper, a new approach is pursued under the same stochastic model, and an exponential approximation formula for the system reliability is obtained as a first approximate solution to a certain functional equation. Its error bound is evaluated from a second approximate solution to the functional equation. Asymptotic formulae for maintainability and availability of the system are also developed. The usefulness of the method is exemplified by a few examples.

Shun-ichi, A **Railway Technical Research Inst, Quarterly Reports**  
 Vol. 24 No. 2, June 1983, pp 77-80

ACKNOWLEDGMENT: EI  
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**22 382309  
 ROLE OF QUANTITATIVE ANALYSIS IN BUS MAINTENANCE PLANNING**

Transit maintenance costs increased dramatically between the late 1970s and early 1980s. At the same time, transit funding assistance has become less available. These circumstances require that managers operate their maintenance systems more efficiently and that they adopt new cost-cutting policies. It is proposed that maintenance managers use quantitative techniques in planning the operations and policies of maintenance systems. The suggested quantitative techniques, commonly used in other areas of business, industry, and government, may be employed to plan transit maintenance system policies and operations. A simplified simulation model of a hypothetical maintenance system is presented as an example of the use of analytical techniques in maintenance planning.

This paper appeared in Transportation Research Record No. 915, Urban Buses: Planning and Operations.

Maze, TH Dutta, U Kutsal, MD (Oklahoma University)  
**Transportation Research Record** No. 915, 1983, pp 39-48, 10 Fig., 1 Tab., 5 Ref.

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**22 382324  
 MAINTENANCE PLANNING AND CONTROL SYSTEMS**

SL, the public transport authority for Stockholm and its suburbs, operates 1800 buses. Cost reductions have been achieved by standardizing bus types and by improving and decentralizing maintenance operations. The BUP management information system has improved the planning and supervision of maintenance and enhanced the control of spare parts. All these steps have reduced life-cycle costs. Formerly 50% of total maintenance, including all major overhauls, took place in a single central maintenance facility. That shop has been closed and work is now done in the five districts, each of which became responsible for all levels of maintenance on buses assigned to them. One shop in each district does the heavy repair. A computerized on-line management information system now accumulates data on mileage, performance and costs. Identifiable annual savings of \$700,000 are yielded by the management system: many other benefits are not quantifiable. The spare parts system has been automated. Components of the computer file include vehicle register, mileage calculation, maintenance history, preventive maintenance planning, payroll with piece work, productivity checking, staff levels, budget calculation, warranty data, thefts and postponed repairing. Further enhancements are in the planning stage.

Johansson, T **UITP Revue** Vol. 32 No. 3, 1983, pp 260-265

ORDER FROM: International Union of Public Transport, Avenue de l'Uruguay 19, B-1050 Brussels, Belgium

**22 382576  
 ARE YOU USING THE NEW "TOTAL PLANNED MAINTENANCE"?**

Total Planned Maintenance (TPM) is a bus management strategy that is intended to avoid breakdowns rather than increasing maintenance productivity after the vehicle is already in the shop. The microcomputer-based management information system involves several daily reporting procedures that aim to avoid unscheduled maintenance and the cost impacts of vehicles out of service. Daily, rather than monthly, data on vehicle miles, consumables and other details makes possible maintenance planning and scheduling in real time. The information stored assures scheduled servicing, productivity of the service process, conformance with manufacturers' preventive maintenance programs, complete defects reporting by drivers and assured follow-up, and exemptions for any excessive consumption of fluids by the vehicles.

Duckworth, L (ATE Management and Service Company, Incorporated) **Bus Ride** Vol. 20 No. 1, Feb. 1984, pp 58-61, 2 Fig., 2 Tab., 1 Phot.

ORDER FROM: Friendship Publications, Incorporated, West 2627 Providence, P.O. Box 1472, Spokane, Washington, 99210

**22 382577  
 MICRO PROCESSOR SOFTWARE—WHAT ARE THE REQUIREMENTS?**

In looking for a vehicle maintenance management system (VMMS) many transit authorities need to identify the requirements. This article gives a

## Transit Maintenance Management

detailed listing for this identification process. There are 6 areas needing reporting: History, Schedules, Performance, Personnel, Utilization, and Costs. Following this, 17 report titles are identified along with necessary forms for data input, as well as the report frequency, report description, and report usage (by whom and for what). VMMS needs also to be integrated with accounting, scheduling, planning, purchasing, inventory control and payroll. Exception reporting is also recommended.

Selleck, FW (Fleet Maintenance Consultants, Incorporated) **Bus Ride**  
Vol. 20 No. 1, Feb. 1984, pp 64-67

ORDER FROM: Friendship Publications, Incorporated, West 2627  
Providence, P.O. Box 1472, Spokane, Washington, 99210

23 319395

**CHANGING PERSPECTIVES ON TRANSPORTATION ENGINEERING EDUCATION**

The role of the university, and especially of civil engineering programs, in the education of transportation professionals is assessed in a discussion that focuses on paratransit training needs. A survey of 110 university representatives of the Transportation Research Board indicated that paratransit education is lagging behind in addressing the broader issues of paratransit. It was also found in the survey that most transportation facilities are small (50 percent have one or two people) but that most offer graduate programs. Paratransit may be a harbinger of trends toward a short-term, service-oriented approach to transportation development by people who lack or do not need the traditional transportation engineering and planning skills. Case-study analysis of five leading, experienced paratransit organizations disclosed that individuals with entrepreneurial skills and a motivation to innovate were key factors in the success of local paratransit systems. A set of paratransit curriculum materials that consists of five case-study documents and supporting documents (a case-study overview, a set of selected readings, a paratransit resource guide, and a curriculum guide) is described. These materials are intended for use by faculty, students, and professionals interested in paratransit, can be used in a variety of course formats or by students alone, and are intended to address some of the educational needs in the paratransit field while presenting the broader dimensions of it. Finally, a brief commentary on educational issues is presented. (Author)

This paper appeared in Transportation Research Record No. 748, New Directions in Transportation Education.

Cook, AR Barb, CE, Jr West, LB, Jr (Oklahoma University) **Transportation Research Record** No. 748, HS-030 297, 1980, pp 1-5, 2 Tab., 18 Ref.

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23 319398

**TRAINING AND EDUCATION IN TRANSPORTATION: FUTURE DIRECTIONS**

The dramatic changes in the environment in which transportation professionals operate in the United States and the impact of these changes on transportation education and training are examined. Within a decade, the definition of the urban transportation "problem" has been expanded from one focused solely on congestion to one that includes at the very least the relationship between transportation and the following factors: energy, air quality, equity, safety, congestion, land use, noise, and more efficient use of scarce resources. These new problem definitions and the skills necessary to deal with them effectively have added to the responsibilities of transportation educators and represent forces of change in U.S. educational programs. Actions that could be taken to prepare for the future professional needs of the transportation sector are recommended. (Author)

This paper appeared in Transportation Research Record No. 748, New Directions in Transportation Education.

Hoel, LA (Virginia University); Meyer, MD (Massachusetts Institute of Technology) **Transportation Research Record** No. 748, HS-030 300, 1980, pp 15-21, 21 Ref.

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23 380128

**PATH TRAINING NEEDS STUDY**

This study was undertaken to allow Port Authority Trans-Hudson to have a better understanding of manpower training requirements and provide an opportunity for individual self-development within the constraints of efficiency and economy. The issues studied are common throughout the transit industry. The project identified those activities that constitute the organizational mission, describes them in functional activity lines, analyzes their makeup from the standpoint of determining what human factors were required in their performance and develops response strategies where deficiencies are identified. In addition to a methodology for identifying training needs, job content analysis was seen as valuable in safety management, affirmative action, increased employee commitment. Among topic studies was development of staff for senior managerial assignments.

Port Authority Trans-Hudson Corporation TS A-581, IT-09-0058, No Date, v.p.

ORDER FROM: Port Authority Trans-Hudson Corporation, Path Plaza, Jersey City, New Jersey, 07306

23 380141

**HUMAN RESOURCES FOR MAINTENANCE: RESOURCE PAPER**

The human resource problem in bus maintenance has developed over many years with the decline of the work-place environment and increasing complexity of organizational structure. Diminishing worker skills (real or perceived) and reduced motivation affect labor effectiveness. Workers' changing views of their jobs and a need for self-esteem also are influential. Better on-the-job reference material improves motivation and self-esteem of the mechanic while also improving vehicle reliability. Enlarging the scope of the traditional supervisor's role to include an awareness of changing job values and difficulties related to worker motivation also helps human-resource management. Standardizing personnel practices and clearly defining departmental objectives and priorities through supervision improve staff harmony. Once the industry confirms these findings, a series of pilot projects can refine improvement actions. It may prove cost effective to set up regional schools where managers and supervisors can be taught these techniques and be provided with documentation to take back to their maintenance activities.

This paper appeared in Transportation Research Board Special Report 198: Bus Maintenance Improvement; Proceedings of the Bus Maintenance Improvement Workshop, April 14-16, 1982, St. Louis, Missouri.

Mitchell, JG (Detroit Department of Transportation) **Transportation Research Board Special Report** No. 198, 1983, pp 37-40, 1 Tab., 2 Ref.

ORDER FROM: TRB Publications Off

23 380142

**HUMAN RESOURCES FOR MAINTENANCE: WORKSHOP REPORT**

Eight problems were identified as important in considering human resources for maintenance: Performance measurements and standards; technical information and training; line-level maintenance supervision; upper-level maintenance managers; motivation, upper-level management awareness of maintenance needs, training, and communication. High priority was assigned to performance measurement, training and line supervision. Medium priority was assigned to technician motivation and communication skills of upper-level maintenance management. Lower priority was assigned to upper level management's awareness of importance of maintenance, training packages, and inter-property communications.

This paper appeared in Transportation Research Board Special Report 198: Bus Maintenance Improvement; Proceedings of the Bus Maintenance Improvement Workshop, April 14-16, 1982, St. Louis, Missouri.

**Transportation Research Board Special Report** No. 198, 1983, pp 40-42

ORDER FROM: TRB Publications Off

23 380150

**DEVELOPMENT OF EDUCATIONAL TOOLS FOR MBA PERSONNEL TASK 237, PROJECT PR-09009**

San Juan, Puerto Rico, is served by the Metropolitan Bus Authority (MBA). With UMTA funds, MBA commissioned a study of educational activities for its personnel as a way to upgrade job performance, enhance working conditions and improve services for the general public. Training must be integrated with other management strategies. After initially studying job requirements and matching them with employees' qualifications for the work they perform, specific training needs were identified. This final report analyzes and recommends training needs in occupational skills by job categories, analyzes training needs within specific groups of employees, and recommends training activities to satisfy needs analyzed previously. The permanent development curriculum involves clinics, workshops and laboratories organized in courses by general topics. Each program is directed to one of three target groups—supervisors, workshop personnel, and bus drivers. The philosophy is based on continuing training.

Puerto Rico University Consultants Final Rpt. Nov. 1982, v.p., 16 Fig., 25 Tab., 3 App.

ORDER FROM: Puerto Rico University Consultants, San Juan, Puerto Rico

23 380183

**DRIVER INCENTIVE PROGRAM PAYS DIVIDENDS TO TRANSIT IN MINNEAPOLIS/ST. PAUL**

When Twin Cities' Metropolitan Transit Commission expanded its "participative management" philosophy from work areas with standard hours and fixed locations to its bus drivers, there were questions about applicability to such a large, geographically dispersed group with variable work schedules. An employee-management task force outlined the need for such a program, its parameters and the awards. Grades of driver proficiency were established with varying levels of recognition and cash prizes. During the first year, starting in June 1982, there was improvement in morale and operating statistics (payroll/platform ratio, accidents and absenteeism declined while output increased). New attitudes were evident in supervisors and drivers. Despite initial concern that too few drivers would qualify to provide real incentive and improve morale, fully 26% of the driver work force met or exceeded criteria for "distinguished driver" status in the first year. Another 9% achieved the "meritorious driver" award. MTC intends to take its program to the transit industry, stressing that recognition programs cannot neglect the largest and most expensive segment of the transit industry work force—its vehicle operators. In the face of steadily increasing wages, productivity becomes the critical factor.

Olsen, LB (Metropolitan Transit Commission) *Passenger Transport*  
Vol. 41 No. 38, Sept. 1983, pp 6-8

ORDER FROM: American Public Transit Association, 1225  
Connecticut Avenue, NW, Washington, D.C., 20036

23 381489

**ON DISCIPLINE**

During the last few decades, developing the ability to discipline employees has become increasingly difficult. The main reasons for that are a failure to properly apply discipline in the past and the emergence of a philosophy which emphasize the rights of the "individual". This article explains why discipline administration is currently so difficult, and reviews some elements necessary for a good discipline program: the rules must be fair, they must be communicated to each employee, and they must be consistently applied.

Powell, JW, Jr (Queen City Metro) *Transitions* 1983, pp 32-39

ORDER FROM: ATE Management and Service Company,  
Incorporated, Editor, 671 Vine Street, Suite 800, Cincinnati, Ohio,  
45202

23 381567

**ANALYSIS OF LABOR IMPACT ON CHANGES IN MANAGEMENT STRUCTURE WITHIN THE TAXICAB INDUSTRY**

The objectives of this report are to: (1) provide a contemporary assessment of labor relations within the taxicab industry; (2) examine how the changing structure of the taxicab industry has affected labor relations within the industry; and (3) examine possible future directions of labor relations in the industry. The report discusses the growth of independent contracting within the industry together with a review of recent National Labor Relation Board decisions and court decisions relevant to independent contracting. The movement of taxicab organizations into paratransit operations and its implications to labor relations is also examined.

Bigoness, WJ

North Carolina Agricultural and Technical State U, Urban Mass  
Transportation Administration Final Rpt. A/T-TI-49-RR-82, UMTA-  
NC-11-0009-83-5, Sept. 1983, 28p Contract DOT-UMTA-NC-11-0009  
ORDER FROM: NTIS PB84-111368

23 381569

**DON'T FORGET THE DRIVER—A PILOT STUDY OF ATTITUDES TO SCHEDULES AND WORKING CONDITIONS**

The objective of the study was to develop and pilot a wide range of survey techniques to measure aspects of driver attitudes towards working conditions and to demonstrate the kinds of information that could be obtained. These techniques would include both interviewer-administered and self-completion questionnaires that could be used either as part of a general monitoring program or within a series of more detailed, specialized studies.

Botton, CG Jones, PM

Oxford University, England TSU/REF-187/CP, July 1982, 34p

ORDER FROM: NTIS PB84-111921

23 381579

**UMTA (URBAN MASS TRANSPORTATION ADMINISTRATION) SUMMER RESEARCH AND DEVELOPMENT WORKSHOP FOR FACULTY FROM MINORITY INSTITUTIONS (1982)**

The primary purpose of this faculty training project was to increase the participation of faculty from minority institutions in the research and development programs of the Institute for Urban Affairs and Research at Howard University. This six-week summer research development workshop provided training in three areas, namely—research planning and management, grantsmanship, and computer utilization. In addition to lectures, panel discussions, and a practicum that provided the opportunity for participants to utilize their knowledge and skills in developing proposals, the six-week workshop included visits to 3 transit systems: Washington Metropolitan Area Transit Authority (WMATA), Greater Richmond Transit Company, and the Southeastern Pennsylvania Transit Authority (SEPTA). Project staff and consultants provided technical assistance for a seven month period following the six-week workshop activities.

Portions of this document are not fully legible.

Leashore, BR Ross, JA Braithwaite, RL  
Howard University, Urban Mass Transportation Administration Final  
Rpt. UMTA-DC-11-0013-83-1, Apr. 1983, 156p

ORDER FROM: NTIS PB83-252411

23 381586

**SUPERVISORY TRAINING COURSE FOR FIRST-LINE BUS MAINTENANCE SUPERVISORS: PLAN, ASSIGN, AND MONITOR WORK. EXECUTIVE SUMMARY**

The report describes the procedures utilized and the resulting outcomes in the development and trial of a training course for first-line bus maintenance supervisors. A supervisory training course for these supervisors was designed to use a performance-based approach to training—an approach geared to develop trainees' knowledge and skills in the tasks that actually make up the job of a first-line bus maintenance supervisor. Conclusions were drawn and recommendations presented for implementation of this course and additional supervisory training course development, based upon the verified supervisory skills in other identified functional areas.

See also PB84-104686.

Hamilton, JB

National Center for Research in Vocational Ed, Urban Mass  
Transportation Administration Final Rpt. UMTA-OH-11-0006-83-1,  
July 1983, 8p Contract DOT-UMTA-OH-11-0006

ORDER FROM: NTIS PB84-104694

23 381587

**SUPERVISORY TRAINING COURSE FOR FIRST-LINE BUS MAINTENANCE SUPERVISORS: PLAN, ASSIGN, AND MONITOR WORK. FINAL REPORT**

This report describes the procedures utilized and the resulting outcomes in the development and trial of a training course for first-line bus maintenance supervisor. A supervisory training course for these supervisors was designed to use a performance-base approach to training—an approach geared to develop trainees' knowledge and skills in the tasks that actually make up the job of a first-line bus maintenance supervisor. The tasks performed on the job were identified by expert, practicing first-line bus maintenance supervisors from seven major urban mass transit authorities. The 112 task statements in eleven functional areas were then verified as important through a review and rating process by 50 supervisors and their superiors in a random sample of other transit authorities throughout the United States. High-priority areas for training identified in the field were planning, assigning, and monitoring work. In the development of the course, tasks in these areas were covered in information and practice activities clustered into three instructional modules.

See also PB84-104694

Hamilton, JB

National Center for Research in Vocational Ed, Urban Mass  
Transportation Administration Final Rpt. UMTA-OH-11-0006-83-2,  
July 1983 Contract DOT-UMTA-OH-11-0006

ORDER FROM: NTIS PB84-104686

23 381674

**EFFECTS OF A PUBLIC TRANSPORT STRIKE**

In May 1981 the urban public transport of the city of The Hague in the Netherlands was on strike for a period of three weeks. During and directly after this strike the project bureau integrated transport studies collected data to analyse the effects of the unavailability of urban public transport in order to gain a deeper understanding of the role of public transport in the urban transport system. The effects under investigation are changes in the frequency of trips, in the choice of destination (mainly shopping), in the choice of mode and in the accident rates. The main part of the study is based on a survey with retrospective questions of bus and tram passengers made three days after the strike. A number of specific surveys were performed. To collect more information about the journey to work a postal survey was performed of civil servants at the Ministry of Transport and the PTT (3500 respondents). Changes in the orientation towards shopping centres were investigated by interview of visitors to these centres during and after the strike. The increase in the number of bicycle trips was determined by a screenline survey across the main experimental cycle lane and parallel lanes. Specific socio-economic groups like elderly people, migrant workers, visitors to hospitals and doctors were interviewed. Information about trips between railway stations and final destinations was collected from train passengers. A large number of visual counts of the number of cars (including the number of passengers) and bikes on screenlines in and around the city were made. Finally the occupation of parking space was surveyed by aerial photography. In this paper an overview of the main results of the analyses is presented. (TRRL)

Public Transport. Proceedings of Seminar M held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 27-39, Tabs.

ACKNOWLEDGMENT: TRRL (IRRD 272836)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

23 382220

**DELAWARE ADMINISTRATION FOR REGIONAL TRANSIT (DART). FARE HANDLING AND OPERATOR PERFORMANCE ANALYSIS**

This is a report of an 11-day security evaluation of the bus drivers of the Delaware Administration for Regional Transit (DART) and involved observations on courtesy, driving ability, adherence to DART regulations, and collection of passenger revenues. Deficiencies were noted in wearing of uniforms, smoking, driving practices, fare collection, courtesy toward passengers, and regard for rules dealing with other DART requirements. The majority of the problems were seen as resulting from supervision and apathy on the part of the bus drivers.

Burns International Security Services, Inc, Delaware Administration for Regional Transit Final Rpt. Proj. DE-09-0006, July 1983, v.p. Grant UMTA-DE-09-0006

ORDER FROM: Delaware Administration for Regional Transit, One South Monroe Street, P.O. Box 1670, Wilmington, Delaware, 19899

23 382234

**DELAWARE ADMINISTRATION FOR REGIONAL TRANSIT. HUMAN RELATIONS TRAINING PROGRAM**

This report describes the human-relations workshops conducted by Dr. G. E. Manning of Northern Kentucky University for the Delaware Administration for Regional Transit (DART). Each workshop included employees from all segments of the DART organization and all levels of responsibility from hourly employees to supervisors and top management. Topic of the first workshop was management of stress in life and at work. The second workshop was a sociological and historical examination of why people do what they do, particularly in public service organizations such as transit. The Employee Development Program for DART involved consideration of stress, values, personality and problem solving with the goals of self understanding, communication and teamwork. With EDP as a backdrop, the DART management held a one-day session on Managing for Productivity. Details of the various instructional and discussion materials are included.

Northern Kentucky University, Delaware Administration for Regional Transit Final Rpt. July 1983, v.p., Figs. Grant UMTA-DE-09-0006  
ORDER FROM: Delaware Administration for Regional Transit, One South Monroe Street, P.O. Box 1670, Wilmington, Delaware, 19899

23 382264

**LIABILITY: ATTITUDES AND PROCEDURES**

The impact of individual and organizational policies concerning liability as reflected in the techniques and procedures followed by an organization is discussed.

Vansant, RE (Black and Veatch) *Journal of Professional Issues in Engineering* Vol. 109 No. 4, Oct. 1983, pp 276-281

ACKNOWLEDGMENT: EI

ORDER FROM: ESL

23 382314

**VIDEO ENHANCES SIMULATOR'S VALUE AS A DRIVER TRAINING AID**

As the cost of driving cab simulators comes down and their flexibility goes up, metro operators in particular are discovering the value of training that can cover complex failure modes as well as routine duties. The twin-cab simulator on which drivers for Lines 3 and 4 of Seoul's Subway will be trained, uses video discs to generate the view of the track ahead, while the instructor can initiate faults simply by touching one of his colour TV monitor screens.

Grant, LG (Marconi Instruments Limited) *Railway Gazette International* Vol. 140 No. 1, Jan. 1984, pp 42-43, 2 Phot.

ORDER FROM: ESL

23 382575

**AN ADVANCED LOCOMOTIVE SIMULATOR: ITS CAPABILITIES AND APPLICATIONS**

The research and locomotive evaluator/simulator (Rales) has been completed recently at IIT Research Institute. The facility represents the state-of-the-art in locomotive simulator technology by providing simulation of the operational environment with such realism that research studies of human factors effects can be conducted.

Johnson, MR Rohter, L (IIT Research Institute)  
American Society of Mechanical Engineers 83-WA/RT-9, 1983, n.p.

ORDER FROM: ESL

23 382608

**STUDY OF THE CAREERS OF PARTICIPANTS IN UMTA'S TRANSIT MANAGEMENT PROGRAMS (SECTION 10)**

This paper contains the results of a study of two Transit Management Training Programs for which UMTA provides fellowships. From 1969 to 1982, 428 fellowships were granted for attending a program at Carnegie-Mellon University, and 769 for attending Northeastern University, the two programs included in the study. The study focuses on determining certain characteristics of the careers of over 400 employees who attended these courses from 15 transit agencies. A typical employee was promoted two and one half years after taking the course. A high percentage of the attendees reported that the courses had dramatically positive effects on them. Another finding is that almost 60 percent of those employees who attended a course remained with the agency that sent them and almost 7 percent transferred to other transit agencies. Excluding involuntary job changes (retirement, dismissal, etc.) only 11 percent of the sample of transit personnel taking the course have left the transit industry.

Lave, RE  
SYSTAN, Incorporated, Urban Mass Transportation Administration,  
(TSC/DTS-64) Final Rpt. UMTA-MA-06-0126-83-3, DOT-TSC-UMTA-83-40, Nov. 1983, 48p Contract DTRS-57-81-C-00063  
ORDER FROM: NTIS PB84-147461

23 382615

**TRANSIT MANAGEMENT INCENTIVE CONTRACTS. VOLUME I: INFORMATION FOR LOCAL TRANSIT AGENCIES**

This report is the by-product of an exploratory study sponsored by the Urban Mass Transportation Administration regarding the feasibility of expanding the incentive contract concept to the area of public transporta-

tion Management. The study researched the theoretical background of incentive contracts as well as their application in transit and non-transit industries. It also defined the components of the incentive contract as it could be used in the transit industry. These components are: objectives; performance; indicators; payment methods; and contract types. During the course of the study, it became apparent that there was growing interest throughout the transit industry toward the use of incentives. As presentations of the concepts were made to professional organizations, a number of individuals requested detailed guidance on incorporating incentive clauses into their existing agreements. Similarly, acceptance of the concept of payment-for-performance is evident in several new labor agreements recently enacted. This report provides step-by-step guidance in developing incentive clauses. It is intended for use by local transit agencies' staff and board members who would consider incorporating incentive clauses in

current and future contractual agreements. The report guides the local agency through the assessment of whether or not the concept is feasible for their situation and through the process of resolving the primary considerations. There is no "right" approach given. Examples provided are merely illustrative. The authors note that the approach taken should be a reflection of local objectives and priorities. Volume II: Demonstration Plan, is an Internal Report, and will not be distributed.

Mundle, SR (Kraus, JE)

Booz-Allen and Hamilton, Incorporated, Urban Mass Transportation Administration Final Rpt. UMTA-IT-06-0246-83-1, June 1983, 116p Contract DTUM60-81-C-72091  
ORDER FROM: NTIS PB84-125038

24 331359

**USE OF PERFORMANCE-BASED METHODOLOGIES FOR THE ALLOCATION OF TRANSIT OPERATING FUNDS**

Seven previously proposed performance-based allocation methodologies are reviewed and evaluated. How performance measures can be incorporated into an allocation methodology is examined. Recommendations are made concerning the appropriate use of performance measures in transit operating-assistance allocations.

Miller, JH (Pennsylvania State University, University Park) *Traffic Quarterly* Vol. 34 No. 4, Oct. 1980, pp 555-574, 23 Ref.

ACKNOWLEDGMENT: EI

ORDER FROM: ESL

24 348012

**PROTOTYPE BUS SERVICE EVALUATION SYSTEM**

Many transit operators have a critical need for a service evaluation system which can measure existing service performance. To assist these operators, the Office of Planning Assistance of the Urban Mass Transportation Administration, through its Special Studies Program, initiated operator prototype studies in Boston and Norfolk. The purpose of these studies is to develop and test systems for bus service evaluation. The emphasis of these studies is on how local operators can use existing planning techniques to meet their evaluation needs. This report represents the second report from these studies. This report describes the development and testing of a prototype bus service evaluation system by the Tidewater Transit District Commission (TTDC) in Norfolk, Virginia. The project is a second phase to an Urban Mass Transportation Administration-funded study of bus service evaluation and has two objectives: 1) to develop a service evaluation system utilizing existing techniques and 2) to test and verify that such a service evaluation system is a practical and effective method for service evaluation. The report assesses the TTDC evaluation at the start of the project and describes the development of a new service evaluation system for the TTDC which includes the selection of service indicators, measures, and standards. A description of a trial implementation of the performance evaluation study is included as well as the results of the evaluation of TTDC's fixed route transit services. Data collection methods and costs to support the evaluation system are also reported. The report indicates that the new evaluation system has proven to be a useful tool for both transit management and locally elected officials in the development and funding of TTDC's services. (UMTA)

Becker, AJ Talley, W Krumke, J Anderson, P  
Tidewater Transportation District Commission, Urban Mass  
Transportation Administration Final Rpt. UMTA-VA-09-7001-81-1,  
Apr. 1981, 67p Contract VA-09-7001  
ORDER FROM: NTIS PB82-117763

24 376942

**MANAGEMENT INFORMATION SYSTEMS: A TOP-DOWN APPROACH**

In recent years, improvement of management information systems (MIS) has been the focus of significant concern in the transit industry. Operating in an era of declining public funding, transit managers are concentrating on productivity improvements as a means of preserving service integrity. A sound MIS is an important tool for realizing potential efficiencies through improved performance. Performance statistics and indicators provide diagnostic tools while presenting an overview of system status. The historical approach to MIS development has been through use of extensive hardware and software systems programmed to capture and process detailed information pertaining to all aspects of operations. It might be described as a bottom-up approach. Although this technique provides an excellent data base, it does not necessarily fulfill the specialized information needs of top-level managers. This paper presents a different approach to MIS development, referred to here as a top-down approach. A case study of the Chicago Transit Authority's (CTA) development of a performance monitoring program, consisting of reports for the CTA Board, the Executive Director, and Department Managers is used to illustrate the concept. The approach used at the CTA Merits consideration for two primary reasons. First, a top-down approach was used to ensure that management needs determine the structure of the reporting system and not current data availability or data-processing capabilities. Second, the program is not constrained by computer capacity, thus making the concept applicable to a wide variety of transit organizations.

Prepared for the 62nd Annual Meeting of the Transportation Research Board, January 17-21, 1983. In Press.

Mundle, SR Carter, DW  
Booz-Allen and Hamilton, Incorporated 1983, n.p.

ORDER FROM: TRB Publications Off

24 380129

**MICROCOMPUTERS IN TRANSPORTATION: SOFTWARE AND SOURCE BOOK, JANUARY 1983**

The Urban Mass Transportation Administration (UMTA) and the Federal Highway Administration (FHWA) of the U.S. Department of Transportation provide training and technical assistance in the new and rapidly changing area of transportation application of microcomputers. These two agencies maintain up-to-date microcomputer references for transit and paratransit operators, transportation planners, and traffic engineers. This document contains information pertaining to: 1) microcomputer references and training and; 2) descriptions of software in the areas of transit operations, transportation planning, traffic engineering, and paratransit planning and operations. Much of the information contained in this document will probably be rapidly replaced by newer or better material. An update to this edition of *Microcomputers in Transportation* will be published within the near future.

Urban Mass Transportation Administration, Federal Highway  
Administration UMTA-URT-41-83-1, Jan. 1983, 80p, Refs.

ORDER FROM: NTIS

24 380177

**POTENTIAL AND COST OF COMMUTER OR REGIONAL RAIL SERVICE**

For approximately 100 years, railroads have carried commuting passengers between home and work in nine major metropolitan areas in the United States and Canada. These operations, with one exception, have demonstrated a stability of patronage not usually present in public transit by highway. In more recent years, Toronto has instituted a new, successful, and growing commuter or regional railway system, which indicates that the potential for such service is contemporary as well as traditional. Currently, fuel consumption and currency inflation are two of the most serious national problems. Highway traffic problems are closely related. At least in theory, commuter or regional rail service can mitigate all three of the adverse effects to the mutual benefit of all concerned. The potential usefulness of such commuter or regional rail service is analyzed to determine the demographic characteristics that contribute to its effectiveness. The results are reviewed to test the viability of commuter or regional rail service in other possible areas—either additional corridors in the 10 metropolitan areas currently served or new services to cities served only by highway transit. The possible reduction in federal transit operating assistance and the ever-present need for cost-effectiveness in urban public transit require rigorous cost analysis and economic advantage to justify any commitment to new or expanded service. Labor, energy, and other cost factors are analyzed to determine the potential economic viability of such rail service vis-a-vis other transit alternatives.

This paper appeared in *Transportation Research Record* No. 908, *Transit Terminal Facilities and Urban Rail Planning*.

Tennyson, EL *Transportation Research Record* No. 908, 1983, pp 31-38, 4 Tab., 13 Ref.

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24 380180

**TRAIN CREW REDUCTION FOR INCREASED PRODUCTIVITY OF RAIL TRANSIT**

Labor costs have become the dominant portion of operating costs for transit agencies. Efforts to increase productivity of operating labor have been particularly successful on rail transit systems. For example, development of high-capacity articulated cars, provision of separated rights-of-way, and introduction of self-service fare collection have resulted in an approximately 20-fold increase in productivity of light rail transit systems. Possible methods for reducing train crews on existing systems that have obsolete operations are analyzed. Their implementation is shown to be feasible and, in many cases, not necessarily complicated. It is shown that although the recently built rail transit systems (e.g., Lindenwold Line, San Francisco's Bay Area Rapid Transit, and Atlanta's Metropolitan Atlanta

Rapid Transit Authority) have one-person train crews and thus high productivity, most older streetcar, rapid transit, and regional rail systems still have obsolete and inefficient labor practices. A systematic analysis shows that, on many existing transit systems, the productivity of operating labor can be substantially increased through modest efforts. The greatest potential benefits from the introduction of modern operating methods exist on regional rail systems and, to a lesser extent, on existing rapid transit systems. Cooperation of labor unions should be obtained by retaining jobs through increased service frequency or by passing on a portion of the savings to the operating employees in the form of increased wages for increased duties.

Vuchic, VR (Pennsylvania University, Philadelphia); Potter, TJ, Jr (Banks (RL) and Associates, Incorporated) **Transportation Research Record** No. 908, 1983, pp 51-57, 2 Fig., 2 Tab.

ORDER FROM: TRB Publications Off DOTL JC

#### 24 380802

##### VEHICLE LIFE-CYCLE COSTING WITH PROBABILISTIC PART REPLACEMENT AND REPAIR OPTIONS

The purchase of transportation parts and equipment is a complex task that requires more than just the simple comparison of prices submitted by potential vendors. Ideally, the financial implications of a purchase should be analyzed over the entire life cycle of the item. The theory of how Markov chains were used by a purchasing analyst to solve the problem of whether to equip a new fleet of semitrailers with radial or conventional tires is described. Markov chains are used to develop total tire costs over the life cycle of the semitrailer for both types of tires. Although the methodology is demonstrated by using a truck tire example, the methodology is equally applicable to analyze the life-cycle costs of other transportation equipment.

This paper appeared in *Transportation Research Record* 912, Economic Analysis of Transportation Problems.

Jackson, GC (Wayne State University); Maze, TH (Oklahoma University) **Transportation Research Record** No. 912, 1983, pp 15-18, 3 Tab., 1 Ref.

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#### 24 380825

##### THE CAUSES OF RISING TRANSIT OPERATING DEFICITS

This report presents detailed estimates of the contributions by various factors to growth in operating deficits among U.S. urban transit systems between 1970 and 1980, as well as an extensive analysis of the causes underlying each of these factors. They include increases in operating expenditures per unit of transit service, increases in the aggregate level of service supplied, declining utilization of transit services, and reduced fare revenue per passenger carried. The report also examines variation in the growth of transit operating losses and the relative importance of its different sources among U.S. urban areas. The report provides detailed recommendations for actions by transit operators, transportation planners, and government officials to control rapidly rising deficits. Some of the major findings in this study state that: 1) rising unit labor costs were the most important single source of escalating transit deficits between 1970 and 1980, accounting for more than 43 percent of the inflation-adjusted growth in the industry's operating losses; 2) rising costs for vehicle propulsion energy accounted for 10 percent of growth in the nation's aggregate operating deficit; 3) expansion of the aggregate level of nationwide transit service was responsible for another 16 percent of growth in operating deficits; 4) deteriorating utilization of urban transit service accounted for about 2 percent of total deficit growth; and 5) substantial decline in average fare revenue per passenger accounted for 28 percent of overall increase in operating deficits.

Pickrell, DH  
Harvard University, Urban Mass Transportation Administration Final Rpt. UMTA-MA-11-0037-83-1, July 1983, 160p

ORDER FROM: NTIS PB84-107853

#### 24 380826

##### THE CAUSES OF RISING TRANSIT OPERATING DEFICITS. EXECUTIVE SUMMARY

This document is the executive summary of the final report that presents detailed estimates of the contributions by growth factors in operating deficits among U.S. urban transit systems between 1970 and 1980, as well

as an analysis of causes underlying each factor. They include increases in operating expenditures per unit of transit service, increases in aggregate level of service supplied, declining utilization of transit services, and reduced fare revenue per passenger carried. The summary highlights recommendations for actions by transit operators, transportation planners, and government officials to control rapidly rising deficits. Some of the major findings in this report state that: 1) rising unit labor costs were the most important single source of escalating transit deficits between 1970 and 1980, accounting for more than 43 percent of the inflation-adjusted growth in the industry's operating losses; 2) rising costs for vehicle propulsion energy accounted for 10 percent of growth in the nation's aggregate operating deficits; 3) expansion of the aggregate level of nationwide transit service was responsible for another 16 percent of growth in operating deficits; 4) deteriorating utilization of urban transit service accounted for about 2 percent of total deficit growth; and 5) substantial decline in average fare revenue per passenger accounted for 28 percent of overall increase in operating deficits.

Pickrell, DH  
Harvard University, Urban Mass Transportation Administration Final Rpt. UMTA-MA-11-0037-83-2, July 1983, 11p

ORDER FROM: NTIS PB84-107861

#### 24 380828

##### MICROCOMPUTERS IN TRANSPORTATION. SOFTWARE AND SOURCE BOOK, SEPTEMBER 1983

The Urban Mass Transportation Administration (UMTA) and the Federal Highway Administration (FHWA) of the U.S. Department of Transportation provide training and technical assistance in the new and rapidly changing area of transportation application of microcomputers. These two agencies maintain up-to-date microcomputer references for transit and paratransit operators, transportation planners, and traffic engineers. This document contains information pertaining to: 1) Microcomputer references and training and; 2) descriptions of software in the areas of transit operations, transportation planning, traffic engineering, and paratransit planning and operations.

Urban Mass Transportation Administration UMTA-URT-41-83-11, Sept. 1983, n.p.

ORDER FROM: NTIS

#### 24 381026

##### THE FEASIBILITY AND DESIRABILITY OF PRIVATELY-PROVIDED TRANSIT SERVICES. EXECUTIVE SUMMARY

This research investigates the possibility of the provision of urban bus transit service in selected markets by a private for-profit carrier. The heart of the research is a private market model which models the way in which a for-profit carrier selects service quality and price. The purpose of the private market model is to facilitate analysis of situations in which a private transit provider would, or could be induced to, provide service. The results indicate that profitable service is feasible in a wide variety of market situations when the only alternative is the private car. Moreover, there is considerable flexibility available to the private carrier. If, however, the private carrier must compete with a subsidized or public carrier, private-carrier entry is deterred in all but the largest markets. When competition is only with the private car, profits can be sufficient to cover the non-Federal costs of providing an exclusive roadway. Volume 2 of this research analyses the labor costs of transit provision, with particular reference to the size of the firm. It concludes that transit provision by small firms would reduce labor costs substantially, enable the economic use of minibuses, and aid in the attainment of the goal of profitable service.

Viton, PA Morlok, EK Sudalaimuthu, P Krouk, SE Yaksick, RC  
Pennsylvania University, Philadelphia, Pennsylvania University, Philadelphia, Urban Mass Transportation Administration, (231352685) Final Rpt. UMTA-PA-11-0027-83-1, Nov. 1983, 14p Contract PA-11-0027

ORDER FROM: NTIS PB83-252288



24 381027

**THE FEASIBILITY AND DESIRABILITY OF PRIVATELY-PROVIDED TRANSIT SERVICES. VOLUME ONE**

This research investigates the possibility of the provision of urban bus transit services in selected markets by a private for-profit carrier. The heart of the research is a private market model which models the way in which a for-profit carrier selects service quality and price. The purpose of the private market model is to facilitate analysis of situations in which a private transit provider would, or could be induced to, provide service. The results indicate that profitable service is feasible in a wide variety of market situations when the only alternative is the private car. Moreover, there is considerable flexibility available to the private carrier. If, however, the private carrier must compete with a subsidized or public carrier, private-carrier entry is deterred in all but the largest markets. When competition is only with the private car, profits can be sufficient to cover the non-Federal costs of providing an exclusive roadway.

Viton, PA Morlok, EK Sudalaimuthu, P Krouk, SE Yaksick, RC  
 Pennsylvania University, Philadelphia, Pennsylvania University,  
 Philadelphia, Urban Mass Transportation Administration, (231352685)  
 Final Rpt. UMTA-PA-11-0027-83-2, Nov. 1983, 145p Contract PA-  
 11-0027

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24 381028

**THE EFFECT OF ORGANIZATIONAL AND TECHNOLOGICAL CHARACTERISTICS ON DRIVER WAGE RATES IN URBAN PASSENGER TRANSPORT. VOLUME TWO**

As part of a study of the feasibility of providing transit service by private firms, driver wage patterns in the urban transit industry and other urban public passenger carrier industries were examined. The motivation of this study was the wage pattern observed in some other industries: that the wage rate for the same job often varied considerably with characteristics of the firm and its market. This research examined the impact of organizational and technological characteristics of urban passenger transportation firms on driver wage patterns. It was expected that wage rates would be greater in firms with organizational factors such as large size, monopoly position, subsidization, and unionization. Wage rates were also expected to increase with the size of and therefore, the skill required to operate vehicles. Linear models were developed to investigate the impact of these two types of factors on driver wage rates using data collected from different passenger carriers in the Philadelphia area. Regression results confirmed that the average driver wage rate in a firm did indeed increase with increasing vehicle size and also with firm size, which is used to measure the organizational factor. The results have significant implications for the cost and the feasibility of using minibuses and other small vehicles in the provision of urban transportation. It suggests that efficient use of any given transport technology requires matching with appropriate organizational features.

Krouk, SE Morlok, EK  
 Pennsylvania University, Philadelphia, Urban Mass Transportation  
 Administration Final Rpt. UMTA-PA-11-0027-833, Apr. 1983, 72p

ORDER FROM: NTIS PB83-252304

24 381473

**TRANSPORT STATISTICS GREAT BRITAIN 1972-1982**

Statistical data are presented in tabulated form on: passenger and freight transport, expenditure on transport, energy consumption, employment in the transport and communication industry, road traffic, bus and coach traffic, goods lifted and moved, vehicle ownership (cars, buses and coaches, heavy goods vehicles), roads network, road accidents, vehicle testing, air pollution, motor vehicle offences, forecast of road activity, British Rail (passenger and freight traffic), BR operations, staff and assets, London, Strathclyde and Tyne and Wear Passenger Transport Executive, accidents). Part 4 gives statistics on water transport, and international comparisons are the subject of Part 6. (TRRL)

Prepared in cooperation with the Department of Transport and the Welsh Office.

Her Majesty's Stationery Office Monograph 1983, 141p, Tabs.

ACKNOWLEDGMENT: TRRL (IRRD 272633)

ORDER FROM: Her Majesty's Stationery Office, 49 High Holborn,  
 London WC1V 6HB, England

24 381511

**TRANSIT SYSTEM PERFORMANCE EVALUATION METHODOLOGY FOR WASHINGTON STATE**

This report examines major issues, concepts and methods of bus transit performance evaluation and suggests procedures and guidelines for internal and external monitoring in Washington State. In support of suggested procedures, data analysis on six years of operational and financial characteristics of Washington State systems, 1979-80 Section 15 data, and collected samples of small community/rural systems from other states was conducted. The major objective of the analysis was to test methodologies for developing and assessing transit "peer groups" relative to size and scale of operations, and prior to comparative within-group evaluation.

Kelley, WJ Rutherford, GS  
 Washington State Department of Transportation, Washington State  
 Transportation Center, Federal Highway Administration Final Rpt.  
 WA-RD-57.1, Jan. 1983, 291p

ORDER FROM: NTIS PB83-252775

24 381532

**DEVELOPMENT OF STAFF REQUIREMENTS FOR SHORT DISTANCE PUBLIC TRANSPORT, BETWEEN 1961 AND 1981 [PERSONALINTENSITAET IM OEFFENTLICHEN PERSONENNAHVERKEHR 1961-1981]**

In the framework of a study concerning 115 short-distance public transport undertakings, the "work" production factor was compared to three variables: "ratio of manpower/vehicles produced, occupancy rate of vehicles", and "capacity of the vehicle". The study shows that during the last 20 years, staff requirements have strongly diminished. The level of requirements should stabilize in future, which could impair profitability, if transport undertakings do not compensate for this development by increasing revenue.

Weimer, K-H Internationales Verkehrswesen Vol. 35 No. 4, 1983, pp  
 270-274, 9 Tab., 1 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
 ORDER FROM: Tetzlaff-Verlag GmbH, Havelstrasse 9, Postfach  
 4006, 6100 Darmstadt 1, West Germany

24 381552

**DEVELOPMENT OF STANDARD TRANSIT PROFILES**

The California Department of Transportation project developed a single accessible transit data base which can be updated annually. This pilot data base includes a comprehensive printed listing of 287 public transit and paratransit operators including address, contact person, and ridership information. For 169 largest operators (those with an annual ridership over 25,000), other information is provided on General System and Service Area characteristics, Fleet Operations, Financial Data and Vehicle Needs, Employee Data, and Performance Statistics. These "profiles" can be used by the California Department of Transportation (Caltrans) for statewide transit planning, for technical assistance, and in special programs such as pooled vehicle purchases. Other transportation planning agencies may find the data base useful in assessing regional needs and monitoring regional performance trends. The operators themselves, particularly the smaller ones, will be able to compare their own financial and operating performance with that of similar operators.

Markowitz, F Kaplan, J Landberg, D  
 Ruth and Going, Incorporated, Urban Mass Transportation  
 Administration, California Department of Transportation Final Rpt.  
 UMTA-CA/MT-83/117, Apr. 1983, 112p Contract DOT-UMTA-CA-  
 09-8006

ORDER FROM: NTIS PB83-251579

24 381565

**WEIGHTED PASSENGER MILES MAXIMISATION WITHIN A FINANCIAL CONSTRAINT: AN ALTERNATIVE MANAGEMENT OBJECTIVE FOR TRANSPORT PROVIDERS**

The proposed alternative management objective is designed to fulfill a similar role to that of "Profit Maximization" in a commercial enterprise, in circumstances where profit maximization is an inappropriate or impractical objective. The approach would: (a) lend itself well to quantification; (b)

provide an adequate (if not perfect) separation of transport and social objectives: the "weightings" applied to different classes of passenger miles would be politically determined in accordance with a governing body's general objectives; and (c) apply equally and consistently to various different types of management decision thereby providing a consistent basis for judging among competing claims on scarce resources. The alternative objective setting process may be described as a "value for money" approach in which the maximization of a particular performance related variable, in this case "weighted passenger miles", is posited as the central management goal and the objectives of each functional element of the system re-examined in the light of this measure, subject to the operative financial constraints—in most cases, the amount of subsidy that the governing body decides to make available. An example of hypothetical application to a small rural transit operation in the United States is also provided.

Goodwin, P Bailey, J Cope, DF  
Oxford University, England, Clark University TSU/REF-208/CP,  
1983, 16p

ORDER FROM: NTIS PB84-112168

24 381574

#### TRANSPORTATION COSTING: SEMINAR NOTES

The report discusses the following aspects on transportation costing: Allocation shared costs; Regulatory costing with emphasis on the Uniform Railroad Costing System; and cost theory for the transportation firm.

Talley, WK  
Oxford University, England TSU/REF-223, June 1983, 20p

ORDER FROM: NTIS PB84-114131

24 381583

#### OWNERSHIP AND EFFICIENCY IN URBAN BUSES. WORKING PAPER

Efficiency in urban bus operation depends on, among other things, the institutional form of the bus business. For certain cities in LDCs where there are parallel private and publicly owned operations, it is demonstrated that the costs of private provision are between 50 percent to 60 percent of those of publicly owned concerns. Additional evidence is adduced to show that the quality of private bus services is not markedly inferior and usually superior to the public bus operation.

Microfiche copies only available from NTIS, PB83-264747.

Feibel, C Walters, AA  
International Bank for Reconstruction & Development IBRD-WP-371,  
1980, 26p

ORDER FROM: International Bank for Reconstruction &  
Development, 1818 H Street, NW, Washington, D.C., 20433

24 381597

#### INTERNATIONAL SUBSIDIES

There has been a recent tendency to believe that subsidising public transport is a prop to inefficiency and that neither the passenger nor society receives sufficient benefits to warrant current levels of subsidy in Britain. To obtain a long-term perspective on the trends in financial support over a wide range of operating environments the International Union of Public Transport collected data from some 85 member bus companies for the years 1961, 1971 and 1981. The results confirm a marked decline in the farebox ratios (direct passenger income relative to revenue expenditure) of most member companies, but also demonstrate substantial passenger benefits and few detectable disbenefits. The principal benefits include higher service levels, extended networks, only limited fares rises and simplified fares systems. There have also been clear, and in some cases significant, improvements in efficiency as measured by a range of different indicators, thus denying the argument that subsidies lead to inefficiency. Despite improvements in productivity, unit costs have risen substantially, but much of this rise is beyond the direct control of operators. Applying social cost benefit analysis to the assessment of revenue subsidies to major UK operators suggests that net benefits accrue from subsidy levels which result in farebox ratios which are low, even by European standards. It is apparent that the provision of significant subsidy can assist substantial improvements in the services operated, without any deleterious impact on productivity and that there are significant net benefits to society. (Author/TRRL)

Transport Policy. Proceedings of Seminar M held at the PTRC 11th Summer Annual Meeting, University of Sussex.

Rigby, J (London Transport Executive) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* 1983, pp 39-51, 3 Tab., 7 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273084)

ORDER FROM: Planning and Transport Res and Computation Co  
Ltd, 110 Strand, London WC2, England

24 381681

#### COMPARATIVE TRENDS IN URBAN BUS OPERATION

The decade 1970 to 1980 was one of economic, technical and organisational change for British urban bus operators. PCL has just completed a two-year SSRC-sponsored study of how local authority bus undertakings (districts, PTES, Scottish regions and London transport) performed over the decade which included local government re-organisation, recurring fuel shortages and the almost complete transition from front-engined two-man crewed buses to rear-engined one-person-operated fleets. This paper summarises the results, commenting in particular on the considerable variations in performance between undertakings and assessing why they occurred. Performance is evaluated according to criteria of demand, revenue, fare levels, operating costs, service levels, vehicle and staff productivity. Changes in demand are assessed according to numbers of passenger trips made, which is also related to population served, bus mileage operated and levels of fares. Overall, patronage declined by 25%, but for individual operators the loss varied between an almost negligible level and over 50%. For almost all operators fares rose in real terms, in some instances by as much as 50%. Staff productivity improved for most operators, but with some notable exceptions. With operators and their political masters anxious to avoid the "spiral of decline", service levels have been cut relatively little. Vehicle productivity has often fallen as those limited reductions have tended to affect evening and weekend services with a consequent cut in weekly hours in service for each bus and the technical complexities of modern buses have demanded more maintenance downtime. The paper concludes by highlighting opportunities for change over the next decade. In particular, the paper suggests where hitherto less successful operators might benefit by adopting practices whose worth has been proved in other locations. (Author/TRRL)

Public Transport. Proceedings of Seminar M held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Higginson, M (Polytechnic of Central London) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* 1982, pp 141-154, 7 Ref.

ACKNOWLEDGMENT: TRRL (8311TR206E)

ORDER FROM: Planning and Transport Res and Computation Co  
Ltd, 110 Strand, London WC2, England

24 381691

#### INFORMATION NEEDS OF LOCAL GOVERNMENT TRANSPORT PLANNING AND MANAGEMENT

The work presented here forms part of a current research project into the definition and use of performance measures within the context of local authority transport planning and management. The paper, itself, is concerned with those information needs which relate to the transportation responsibilities and activities of county councils. The paper is presented in two parts. The first section reviews the relationships between the planning and/or management functions of local authorities, and the information systems necessary to fulfil these pre-eminent functions. This emphasis is considered important because of the evolving nature of these relationships. Analysis of both a case study and the available literature suggests that there is a hierarchy of functions ranging from the "task" orientation represented by descriptive data, to the strategic functions of policy monitoring and development where more complex information needs are evident. The extent to which the information needs of the latter higher-order functions are consistent with or related to the more readily accessible lower-order data is discussed with reference to cost, methodology and resource commitment. The second section of the paper is both a presentation and an analysis of the results of a survey designed to identify perceived information need and actual data collection practice in British county councils. (Author/TRRL)

Transportation Planning Practice. Proceedings of Seminar N held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Watters, DAB (Leeds University, England) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* 1982, pp 83-94, 12 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272867)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

24 382229

**SERVICE EVALUATION AND SYSTEM MONITORING PROCESS**

The objective of this study was to develop and implement, where feasible, a system for monitoring and evaluating the fixed-route bus services operated by the Greater Bridgeport Transit District (GBTD). This was part of a general program to produce more cost effective transit services. The monitoring process needed to generate information detailed enough to measure the efficiency and effectiveness of existing or proposed transit services. The funding permitted GBTD to develop a plan for a computerized Management Information System; to collect detailed base-line data on use of the existing fixed-route service; and to create and institutionalize the data collection process for constantly updating existing data that would meet Federal reporting requirements. It was the intention to adapt to Bridgeport conditions the Comprehensive Data Collection Plan of UMTA and to meet UMTA Section 15 reporting requirements.

Greater Bridgeport Transit District Final Rpt. Proj. H-492, UMTA-CT-09-0026, Jan. 1984, v.p., 10 Tab., 5 App.

ORDER FROM: Greater Bridgeport Transit District, 525 Water Street, Bridgeport, Connecticut, 06604

24 382232

**MICROCOMPUTERS IN TRANSPORTATION. SELECTED READINGS VOLUME**

The Urban Mass Transportation Administration (UMTA) and the Federal Highway Administration (FHWA) of the U. S. Department of Transportation provide training and technical assistance in the new and rapidly changing area of transportation application of microcomputers. These two agencies maintain up-to-date microcomputer references for transit and paratransit operators, transportation planners, and traffic engineers. This document is one in a series of selected readings covering technical aspects of microcomputer equipment, software, data communications and other topics. Each volume of selected readings will focus on a single aspect. Thus far, these are: Volume 1 "Getting Started in Microcomputers" Volume 2 "Selecting a Single User System" Volume 2 responds to the growing number of people in transportation-related industries who have decided to acquire a single-user microcomputer and are asking "What should I get?" It recommends a general selection procedure and describes hardware and software in detail. This second edition of Volume 2 updates information contained in the old Volume 2. Old Volume 2 is no longer available.

Urban Mass Transportation Administration, Transportation Systems Center Tech Rpt. UMTA-URT-41-83-12, Nov. 1983, 131p, 3 Fig., 27 Tab. Contract URT-41

ORDER FROM: NTIS

24 382240

**SPECIAL BIBLIOGRAPHY: TRANSIT COSTS, PERFORMANCE EVALUATION, AND SUBSIDY ALLOCATION**

The 394 citations in this bibliography deal with some of the most critical problems confronting transit operators and government bodies in a period of rising operating costs and increasing problems in assuring adequate subsidies. Nearly all are from U. S. sources and the majority are from the past ten years. They include technical reports, journal articles and dissertations.

Urban Mass Transportation Research Information Ser, Urban Mass Transportation Administration UMTA-DC-06-0258-83-3, UMTRIS 83S1, Dec. 1983, 80p Contract DTUM60-81-C-72063

ORDER FROM: TRB Publications Off

24 382296

**A STRUCTURED APPROACH TO MONITORING AND EVALUATING PUBLIC TRANSPORTATION SERVICES**

Development of procedures for monitoring and evaluating public transit systems should begin with formulation of aggregate performance measures reflecting overall system benefits and costs. Disaggregate measures should then be developed to permit closer examination of factors influencing the aggregate measures. Standardized practices should be adopted to express benefits and costs in constant dollars, discounting future benefits and costs to present values. The lack of standardized performance data for different

systems, along with the problems of accounting for special local demographic or geographic factors limits the potential for cross-system comparisons. In Minnesota greater insight was gained from time-series analysis of individual systems. Performance measures should be used with great caution. Transit systems will have to improve the quality and timeliness of their regular reporting procedures. While cost reduction has been the primary emphasis in current performance monitoring, there is need to look at expanding transit benefits through increased ridership or involving new providers. Performance monitoring is still in its infancy; refinements are necessary to achieve the common goal of improved resource management.

Miller, GK Kirby, RF *Transportation Quarterly* Vol. 38 No. 1, Jan. 1984, pp 23-46

ORDER FROM: Eno Foundation for Transportation, Incorporated, P.O. Box 55, Saugatuck Station, Westport, Connecticut, 06880

24 382298

**MEGATRENDS IN URBAN TRANSPORT**

Between the 1960s and 1980s public transit underwent a transition from a private sector business to a public operation. There seems to be no economy of scale in transit; private operators are once again being looked to, to play a role under mounting financial pressures. All mass transit service should be evaluated periodically to determine public interest in continuing subsidy arrangements. Opportunities to develop other arrangements include local take-over of certain regional routes, replacement with ridesharing or other paratransit, or abandonment to possible private sector responses. To foster competition for contracting out certain services and increase the possibility of private sector responses, an extensive review of current regulatory barriers should be made. Ownership and operation of all public transit services should be replaced with concentration on the strengths of public organizations involved. Alternatives should be sought for activities that appear to be less effective and efficient in the public sector. Policies on subsidy should be reviewed for consistency and long-term impact.

Fisher, RJ *Transportation Quarterly* Vol. 38 No. 1, Jan. 1984, pp 87-102

ORDER FROM: Eno Foundation for Transportation, Incorporated, P.O. Box 55, Saugatuck Station, Westport, Connecticut, 06880

24 382305

**ECONOMICS OF COMMUTER EXPRESS BUS OPERATIONS**

With the recent cuts in federal subsidies for transit operations, planners are looking for ways to reduce their operating costs. One way of doing this is to allow the private sector to provide commuter express bus service at little or no subsidy. A study of commuter express bus operations is summarized in which it is concluded that the operating cost for a private carrier is only about half that of the public carriers in Southern California. After 22 public bus lines had been evaluated, the conclusion was that more than \$5 million per year in subsidy could be eliminated if the 22 bus lines were operated by private carriers. The cost savings are attributed to more favorable work rules and the ability to use less costly equipment. One other factor is that private operators will continue operation of a bus only if it is nearly full. The analysis was based on operating budgets for the two transit districts in Los Angeles and Orange Counties and on a survey of private agencies in the region.

This paper appeared in *Transportation Research Record* No. 915, Urban Buses: Planning and Operations.

Williams, B Wells, B (Southern California Association of Governments) *Transportation Research Record* No. 915, 1983, pp 13-18, 1 Fig., 2 Tab.

ORDER FROM: TRB Publications Off DOTL JC

24 382306

**SOURCES OF RISING OPERATING DEFICITS IN URBAN BUS TRANSIT**

Annual operating expenses incurred by U.S. urban transit systems rose more than \$5 billion from 1960 to 1980, of which a rapidly declining fraction was covered by farebox receipts. As a result, the industrywide operating deficit approached \$4 billion by the end of this period. Although rail transit systems first incurred large operating losses, by 1980 the motor bus segment of the U.S. public transit industry accounted for three-quarters of its aggregate deficit. Recent growth in bus transit operating deficits can

be traced to escalating costs per unit of service, rapid service expansion despite declining utilization of existing service levels, and decisions to simplify and reduce fare structures. A detailed examination of each of these sources of rising operating losses is presented, and attempts are made to assess both their individual contributions to deficit growth and their respective underlying causes. Following this examination, an illustration of how these developments interacted to produce the explosive growth in bus transit operating deficits that occurred during the 1970s is given. Specific recommendations are made for bringing growing losses under control.

This paper appeared in *Transportation Research Record* No. 915, *Urban Buses: Planning and Operations*.

Pickrell, DH (Harvard University) *Transportation Research Record* No. 915, 1983, pp 18-24, 4 Tab., 23 Ref.

ORDER FROM: TRB Publications Off DOTL JC

#### 24 382578

##### HIGH PERFORMANCE MICRO-COMPUTING

A microcomputer is one of the most effective investments any transit fleet operator can make because it offers the immediate cost-saving leverage of large main-frame units at an economical price. Micros are also easy for inexperienced people to use. Good microcomputer programs handle the entire operating cycle costs of a vehicle, including the maintenance portion. This makes possible opportunities for cost analysis and cost savings for fleets in terms of acquiring, operating and replacing vehicles.

Setne, P (Fleet Computing International) *Bus Ride* Vol. 20 No. 1, Feb. 1984, pp 72-74, 1 Phot.

ORDER FROM: Friendship Publications, Incorporated, West 2627 Providence, P.O. Box 1472, Spokane, Washington, 99210

#### 24 382579

##### THINKING ABOUT A COMPUTER FOR YOUR BUS COMPANY?

This article discusses the most important uses of microcomputer developments and the significance to the transit industry. Recent advances in computers and computer programs have made management information systems (MIS) more powerful and less difficult to use while being more affordable for transit operations of all sizes and all modes of service (including paratransit). A research group at Massachusetts University was responsible for reviewing the entire range of computer applications in transit across the country, identifying any deficiencies in the computer industry's ability to address effectively management needs which may be specific to transit and recommending solutions for such shortcomings. MIS for small and medium-sized transit systems was identified as the major problem. A prototype system was developed and successfully tested, based on an economical Relational Data-Base Management System (RDBMS). RDBMS makes it possible to generate new reports from a data base when needed, as well as utilizing graphics software to portray transit-system data to policy boards.

Collura, J McOwen, P *Bus Ride* Vol. 20 No. 1, Feb. 1984, pp 76-78, 1 Fig.

ORDER FROM: Friendship Publications, Incorporated, West 2627 Providence, P.O. Box 1472, Spokane, Washington, 99210

#### 24 382580

##### PIONEER VALLEY TRANSIT AUTHORITY'S INTEGRATED MANAGEMENT INFORMATION SYSTEM

Pioneer Valley Transit Authority (PVTA) serves, through 6 contract operators, a large part of western Massachusetts. It has contracted for a commercial Transit Information Management System (TIMS), a battery of computer programs to meet six specific functional needs of a transit operations. PVTA will be linked with its contractors through this management information system. The central microcomputer has one megabyte (Mb) of memory and 158 Mb of disk storage. The TIMS modules include Financial Management, Payroll & personnel Management, Maintenance & Materials Management, Transportation Management, Management Analysis, and Special Transportation.

*Bus Ride* Vol. 20 No. 1, Feb. 1984, pp 84-85, 1 Tab.

ORDER FROM: Friendship Publications, Incorporated, West 2627 Providence, P.O. Box 1472, Spokane, Washington, 99210

#### 24 382591

##### NATIONAL URBAN MASS TRANSPORTATION STATISTICS, 1982, SECTION 15, ANNUAL REPORT

This report summarizes the financial and operating data submitted annually to the Urban Mass Transportation Administration (UMTA) by the nation's public transit operators, pursuant to Section 15 of the Urban Mass Transportation (UMT) Act of 1964, as amended. The report also contains supplemental Section 15 data submitted by certain eligible transit systems for use in computing Section 9 apportionments. Section 9 is a new formula grant program for capital, operating, and certain other assistance created by the Surface Transportation Assistance Act of 1982 (which amended the UMT Act). The report consists of four chapters. Chapter 1 contains an introduction to the Section 15 reporting system and the relationship to the Section 9 program. Chapter 2 contains aggregate industry statistics derived from the complete Section 15 reports which were submitted (i.e., excluding the supplemental reports). Chapter 3 contains detailed financial and operating data on the individual transit systems which submitted complete Section 15 reports. Chapter 4 contains the operating statistics (derived from both complete and supplemental reports) which were used in the computation of the FY 1984 Section 9 apportionments. All data in this report are for transit fiscal years ending between July 1, 1981 and June 30, 1982.

Jacobs, M O'Connor, R Chen, S  
Transportation Systems Center, Urban Mass Transportation Administration, (DTS-67) Annual Rpt UMTA-MA-06-0107-84-1, DOT-TSC-UMTA-83-46, Nov. 1983, 450p, Figs., Tabs., 3 App.

ORDER FROM: NTIS

#### 24 382763

##### MANAGING TO PROVIDE PUBLIC TRANSPORT

The last ten years has seen much legislation and debate about the provision of public transport. Legislation has sought to encourage better co-ordination and a more explicit statement of objectives, assessment of needs and justification of subsidy. The emphasis has been on better performance of the local authorities. Little was heard about the managers in the industry—those charged with actually providing public transport. More recent legislation has required them to publish performance indices and has introduced a degree of competition in an effort to encourage them to be more effective. But what about the important relationship between them and the local authorities? During 1982 the author undertook a study with managers of bus undertakings in the nationalised, municipal and private sectors in which he sought to identify their attitudes and practices with particular reference to subsidy. He found for example that many managers consider they are required to run services that are a waste of money. In this paper he summarises his conclusions and illustrates his findings with quotations from the managers themselves. He concludes that it may be pressures from operators faced with cash limits rather than the legal requirements to prepare and publish public transport plans which will force county councils to identify and adopt formal objectives for the provision of cost effective public passenger transport. (Author/TRRL) IRRD 273492.

Public Transport Planning and Operation. Proceedings of Seminar L held at the PTRC 11th Summer Annual Meeting.

Winfield, RC (Transportation Management and Marketing Limited) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* 1983, pp 171-182, 1 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273508)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 24 382776

##### APPROACH TO URBAN TRANSIT SERVICE STANDARDS IN A REGIONAL CONTEXT

An approach to the development of transit service standards in a regional context is presented which is based on the definition of differing levels of service for "urban" and "suburban" development densities. A four phase process is described involving the setting of goals and objectives the determination of minimum service standards, setting warrants for increasing service and the on-going review of service standards. The city of Timmins is used as an example of the application of the process. Based on the Timmins experience with services to small suburban communities a model has been developed which related variables such as distance from the major urban areas, ridership per capita, the amount of service provided and

fares charged to service costs. The model has been used to illustrate the trade-offs involved in establishing regular transit services to this type of community. It is concluded that the provision of even a minimum level of service to suburban communities of less than 1000 population will normally have a revenue/cost ratio of less than 0.3. (Author/TRRL)

Proceedings of the 1982 Roads and Transportation Association of Canada Conference, Halifax, Nova Scotia.

Dawson, WR (Delcan Consulting Engineers and Planners)  
Roads and Transportation Association of Canada Proceeding Sept. 1982, 13p, 5 Fig., 3 Tab., 6 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273464), Roads and Transportation Association of Canada

ORDER FROM: Roads and Transportation Association of Canada, 1765 St Laurent Boulevard, Ottawa, Ontario K1G 3V4, Canada

#### 24 382793

##### CUTTING COSTS IN PUBLIC TRANSPORT. THIRTEENTH ANNUAL SYMPOSIUM, UNIVERSITY OF NEWCASTLE UPON TYNE, MARCH 30- APRIL 1, 1982

The following papers were presented at the symposium: The importance of cost minimisation in public transport (Webster,FV); The costs of regulation (Hibbs,J); Formalised systems developments: use of computers to improve productivity (Cochrane,RLD); Operating 1200 buses at a profit (Heubeck,WW); Service improvements using AVM (automatic vehicle monitoring) (Collings,BM); Impact of MAP (Market Analysis Project) upon costs (Trennery,SG); The economic potential for renewed trolleybus operation in Britain (Harrison,M & Tebb,RGP); low cost rolling stock: The BRE-Leyland railbus (Jones,TM); The concept of the O-bahn urban transport system and the economic advantages of bus technology (Niemann,K). (Author/TRRL)

Webster, FV (Transport and Road Research Laboratory); Hibbs, J (City of Birmingham Polytechnic); Cochrane, RLD (Greater Manchester PTE); Heubeck, WW (Ulsterbus Limited); Collins, BM (Dublin City Services); Trennery, SG (Eastern National Omnibus Company Limited); Harrison, M Tebb, RGP (West Yorkshire PTE); Jones, TM (British Rail Research); Niemann, K (Daimler-Benz AG)

Newcastle upon Tyne University, England Monograph 1982, 18p, 18 Fig., 28 Tab., 6 Phot., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 273726)

ORDER FROM: Newcastle upon Tyne University, England, Claremont Road, Newcastle NE1 7RU, Tyne and Wear, England P8401064

#### 24 382886

##### TOWARDS A PRACTICAL COMPARISON-STANDARD FOR URBAN PUBLIC TRANSPORT PERFORMANCE [NORMERING STADSVVERVOER]

In the Netherlands several attempts have been made to establish a comparison-standard for urban public transport performance, according to a similar standard for interurban routes introduced several years ago. Apart from the way the responsibilities for public transport will be arranged in the future, the government must have the possession of a key towards well-balanced distribution of the available or necessary funds. For this purpose, Bureau Goudappel en Coffeng have designed a method for measuring urban public transport performance, which is easy to execute, and which allows the desired decentralisation of responsibilities in the public transport field. This method encourages local authorities to maintain an active policy towards public transport by "rewarding" such a positive attitude and by "penalizing" any communities showing lack of interest. (Author/TRRL) [Dutch]

Conference Papers of the Working Days on Traffic Engineering 1983.

Brogts, PM (Bureau Goudappel en Coffeng) Bijdragen Verkeerskundige Werkdagen 1983 Apr. 1983, pp 249-254

ACKNOWLEDGMENT: TRRL (IRRD 272698), Institute for Road Safety Research SWOV

ORDER FROM: Werkdagcommissie, P.O. Box 163, Driebergen-rijsenbur, Netherlands

#### 24 384618

##### SOFTWARE FOR PUBLIC TRANSPORT [PROGRAMVARA FOER KOLLEKTIVTRAFIK]

This report deals with the requirements of computerized methods and software for different kinds of public transport as well as alternative forms to supply software (service for users), responsibility for program development and co-ordination of different software systems computerized planning methods for local and public transport. Interviews have been made in different enterprises. The results show that a great need for education exists both in the enterprises as well as in institutes for advanced studies. It is necessary to work out a standardized data bank. There is need for evaluation of existing software. The demand for an expert group in this field is acute. (Author/TRRL) [Swedish]

Joernsten, K Thoern, A (Liu)  
Linkopings University, Sweden, (0348-2960) Rapport 82-49, 1982, 49p, 2 Fig., 8 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 274417), National Swedish Road & Traffic Research Institute

ORDER FROM: Linkopings University, Sweden, Matematiska Institutionen, Linoeping, Sweden

#### 24 384663

##### PERFORMANCE AND PRODUCTIVITY REPORT ON THE MIDDLETOWN TRANSIT SYSTEM

This is part of an on-going evaluation of the fixed-route transit service provided by Middletown Area Transit (MAT) which owns seven 32-passenger buses that are maintained and operated by a private contractor. The system is a pulsed-loop design with four routes originating at a terminal in the central business district and a fifth which connects with one of the downtown routes at a shopping center. Service was inaugurated in 1981 and this appraisal is made at the end of the second year of service. One route has failed to meet the ridership standards and will be studied carefully. Operating costs went up 26% during the second year due primarily to increased labor rates and bus maintenance problems. Changes in maintenance practices and the possibility of a new maintenance facility are under study. The Middletown transit operation is one of 12 transit districts in Connecticut with expenses under one million dollars annually. A comparison is made with the peer group operators.

Midstate Regional Planning Agency, Urban Mass Transportation Administration, Connecticut Department of Transportation UMTA-CT-09-0044, Oct. 1983, 42p, 10 Fig., 17 Tab., 7 Ref. Grant UMTA-CT-09-0032

ORDER FROM: Midstate Regional Planning Agency, Connecticut

#### 24 384902

##### MICROCOMPUTERS IN TRANSPORTATION: SELECTING A SINGLE-USER SYSTEM. VOLUME 2. SECOND EDITION

The Urban Mass Transportation Administration (UMTA) and the Federal Highway Administration (FHWA) of the U.S. Department of Transportation provide training and technical assistance in the new and rapidly changing area of transportation application of microcomputers. These two agencies maintain up-to-date microcomputer references for transit and paratransit operators, transportation planners, and traffic engineers. This document is one of selected readings covering technical aspects of microcomputer equipment, software, data communications and other topics. Each volume of selected readings will focus on a single aspect. Volume 2 recommends a general selection procedure and describes hardware and software in detail.

See also PB83-169904.

Albright, R  
Urban Mass Transportation Administration, Transportation Systems Center Tech Rpt. UMTA-URT-41-83-12, Nov. 1983, 145p

ORDER FROM: NTIS PB84-137579

#### 24 384910

##### INNOVATION AND INCREMENTAL IMPROVEMENT IN BUS TRANSIT PASSENGER DATA COLLECTION. EXECUTIVE SUMMARY

The overall objectives of the research are: 1) to identify the potential for innovation and for incremental improvement in bus transit passenger data collection, and 2) to develop and test data collection and processing

methodologies to five transit managers and operators the ability to make needed improvements. The literature review showed little application of modern statistical sampling techniques to bus passenger data until 1977. The three key applications of statistics since then are documented in some detail. The focus of the research was on data collection techniques for both total passengers and the Section 15 passenger service consumed reporting requirements. An inventory of 58 transit properties in the United States with 100 or more peak hour buses showed a wide range of techniques being used to collect both total passenger and Section 15 data. Classification schemes for total passenger and Section 15 data collection procedures were developed and prototypical transit properties identified in each major class. Application of statistical sampling theory to evaluate alternative sampling plans for the prototypical properties showed substantial potential for improvements in accuracy or reductions in data collection and processing costs or both. The results of the analysis of the prototypical total passenger data collection procedures were used to develop an evaluation methodology to aid transit managers in selecting an improved data collection procedure for their property. A final case study illustrated the potential for integrating Section 15 with a regular total passenger counting program.

Smith, RL, Jr  
Wisconsin University, Madison, Urban Mass Transportation  
Administration UMTA-WI-11-0008-84-1, Dec. 1983, 6p Grant  
UMTA-WI-11-0008

#### 24 384911

##### INNOVATION AND INCREMENTAL IMPROVEMENT IN BUS TRANSIT PASSENGER DATA COLLECTION. FINAL REPORT

The overall objectives of the research are: 1) to identify the potential for innovation and for incremental improvement in bus transit passenger data collection, and 2) to develop and test data collection and processing methodologies to five transit managers and operators the ability to make needed improvements. The literature review showed little application of modern statistical sampling techniques to bus passenger data until 1977. The three key applications of statistics since then are documented in some

detail. The focus of the research was on data collection techniques for both total passengers and the Section 15 passenger service consumed reporting requirements. An inventory of 58 transit properties in the United States with 100 or more peak hour buses showed a wide range of techniques being used to collect both total passenger and Section 15 data. Classification schemes for total passenger and Section 15 data collection procedures were developed and prototypical transit properties identified in each major class. Application of statistical sampling theory to evaluate alternative sampling plans for the prototypical properties showed substantial potential for improvements in accuracy or reductions in data collection and processing costs or both. The results of the analysis of the prototypical total passenger data collection procedures were used to develop an evaluation methodology to aid transit managers in selecting an improved data collection procedure for their property. A final case study illustrated the potential for integrating Section 15 with a regular total passenger counting program.

Smith, RL, Jr  
Wisconsin University, Madison Final Rpt. UMTA-WI-11-0008-84-2,  
Dec. 1983, 104p, Figs., Tabs., 15 Ref. Grant UMTA-WI-11-0008

#### 24 385268

##### TROLLEY BUS ECONOMICS

Carl Natvig, of the San Francisco Municipal Railway, explores the economics of the trolley bus state of the art and summarizes the economic history of the trolley.

This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Natvig, C Transportation Research Board Special Report No. 200,  
1983, pp 24-27

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25 380126

**AUTOMATIC FARE COLLECTION COMES TO BUS TRANSIT**

Described is Fast Fare, the modular, fully integrated, slide-through fare collection system for transit buses being introduced by Cubic Western Data Corporation. The bus segment of the automatic fare collection market is seen as having great potential. The modular concept enables various levels of sophistication to be incorporated into the farebox. In addition to coins and currency, Fast Fare can accept stored-value rides from magnetic fare cards, generate audit reports on ridership, handle time-duration passes and transfers from other transit agencies, conduct self-diagnosis for maintenance, and enable data capture by probe and mag-stripe card. The slide-through module has already been extensively tested in revenue service. Dispensing of magnetic-strip tickets will be by separate units off the vehicles. Major goal is to reduce cash handling through pre-payment.

Paul, B *Metro* Vol. 79 No. 6, Oct. 1983, 3p, 1 Phot.

ORDER FROM: Bobit Publishing Company, 2500 Artesia Boulevard, Redondo Beach, California, 90278

25 380131

**SELF-SERVICE FARE COLLECTION STATE-OF-THE-ART**

Self-service fare collection places primary responsibility for fare payment on the passenger rather than on transit operators. The passenger determines and pays for the fare through automatic machines that dispense and validate tickets. Neither vehicle drivers nor station attendants scan tickets and passes; there are no collectors or turnstiles. Passengers are required to present their ticket, pass or receipt to fare inspectors who perform random checks. This system is based on checking on a small percentage of passengers, rather than every passenger. Upon request, passengers must show correct proof of payment. Inspectors may collect correct fare or issue citations to passengers who are without proof of payment. The most important reason for SSF is lower operating costs. Other benefits are reduced stress on vehicle operators, reduced fare evasion, faster loading, greater vehicle productivity, increased security, fostering of greater use of passes or multi-ride tickets, and increased passenger convenience and comfort. Case studies of the Portland, OR, Tri-County Metropolitan Area bus system and of the San Diego Light Rail Transit Project of the Metropolitan Transit Development Board are described and discussed.

Organization for Environmental Growth Inc, Urban Mass Transportation Administration Aug. 1983, 13p, Photos.

ORDER FROM: Organization for Environmental Growth Inc, 3612 Twelfth Street, NE, Washington, D.C., 20017

25 380173

**ANALYSIS OF FARE-COLLECTION-SYSTEM DEPENDABILITY (ABRIDGMENT)**

The collection of transit system fares has become more sophisticated in recent years with more flexible fare structures. However, the more complex equipment such fare structures require has often been plagued by reliability problems, which results in significant passenger congestion and delay. Although development efforts are under way to improve reliability, one needs to know by how much the reliability needs to be improved. Attempting either too small or too large an improvement may result in a waste of transit funds and/or no relief from the congestion and delay problems. In order to determine the amount of improvement necessary, a method is needed to determine the dependability of a fare-collection system, i.e., the passenger congestion and delay in the system, given its demand, capacity, reliability, maintainability, etc. This paper discusses how a dependability analysis can be used to obtain reliability and other specifications and presents models to carry out such an analysis. Various types of dependability analyses are described (evaluation, sensitivity analysis, specification determination, and trade-off analysis), and purposes for which transit systems can use such analyses are discussed. Simulation and analytical models to evaluate fare-collection-system dependability are presented, as well as the data requirements for the models. A sample fare-collection dependability analysis that uses data based on an actual transit system is described, and the results and conclusions are discussed.

This paper appeared in *Transportation Research Record No. 908, Transit Terminal Facilities and Urban Rail Planning*.

Heimann, DI (Transportation Systems Center) *Transportation Research Record* N908, 1983, pp 13-16, 1 Tab., 9 Ref.

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25 380178

**ASSESSMENT OF RAIL AUTOMATIC FARE-COLLECTION EQUIPMENT PERFORMANCE AT TWO EUROPEAN TRANSIT PROPERTIES**

The findings of an assessment of the performance of automatic fare-collection (AFC) equipment at two European transit properties—Tyne and Wear Transport Executive and Stuttgarter Strassenbahnen—are summarized. The properties operate in Newcastle, England, and Stuttgart, West Germany, respectively. Each has recently installed self-service ticket vendors and/or automatic gates that incorporate such new technologies as microprocessors, failure diagnostics, coin recycling, and needle printers. The analysis of the AFC equipment at each foreign property was based on a property evaluation plan (PEP) developed by Input Output Computer Services, Inc. The specific objectives of the assessment were to (a) apply the PEP to the two properties in order to assess AFC equipment performance; (b) assess any major performance differences between similar types of equipment, including equipment in use at U.S. rail transit properties; and (c) investigate innovative equipment techniques for possible use by U.S. transit properties. Analysis of performance results indicated that reliabilities for the European equipment were significantly greater than those for AFC equipment in service at Port Authority Transit Corporation, Illinois Central Gulf, Washington Metropolitan Area Transit Authority, and Metropolitan Atlanta Rapid Transit Authority. It is suggested that such state-of-the-art equipment could be used at some American transit properties. The net result could be increased maintenance productivity, enhanced unmanned station operation, and improved control of accounting data.

This paper appeared in *Transportation Research Record No. 908, Transit Terminal Facilities and Urban Rail Planning*.

Morrissey, JM (Input Output Computer Services, Incorporated) *Transportation Research Record* No. 908, 1983, pp 38-43, 5 Tab., 1 Ref.

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25 380221

**MULTIPLE-FARE MACHINES FOR MODERNIZED TICKET ISSUING ON THE DB**

It was only in the early 1960s that the DB started to employ ticket-issuing machines in large numbers. These machines could issue only one class of ticket, and also were without data acquisition, so several machines were necessary for a range of fares. With the introduction of large integrated transport systems it became essential to have multiple-fare machines. The DB's central office in Munich therefore started in 1975 with the development of a multitariff standard ticket machine for various types of fare structures. The standard issuer is a multiple-fare cash-safe machine with a self-filling change return, and also can be fitted with a banknote processor if this is required. After this standard DB ticket issuer had proved its worth on numerous local transport systems, it was adopted for use in general railway travel in 1979. With the Modernized Ticket Issuing project MOFA a concept was created for the first time which includes every ticketing function in a self-contained DB system for the greatest possible degree of customer self-service. At present more than 3,000 local-transport ticket machines are relieving ticket-office personnel of time-consuming routine work at almost every station and are thus contributing to a better service for rail travellers. [German]

Schuster, E *Eisenbahntechnische Rundschau* Vol. 32 No. 7-8, July 1983, 4p

ACKNOWLEDGMENT: British Railways  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

25 380222

**LT UNFOLDS FARE COLLECTION STRATEGY**

Five key aims lie behind LT's strategy are to provide better access to the Underground by cutting the time taken for passengers to obtain tickets; to reduce the cost of issuing and collecting tickets; to update ticketing methods and improve security for staff; to facilitate fares integration with buses and BR; and to reduce fraud.

*Railway Gazette International* Vol. 139 No. 9, Sept. 1983, 2p

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

25 380806

**COMMUTER RAILROAD PRICING IN THE NEW YORK METROPOLITAN REGION (ABRIDGMENT)**

A framework for examining commuter railroad pricing in the New York metropolitan region is presented. The Metropolitan Transportation Authority (MTA) operates two commuter railroads: the Long Island Railroad, which is the country's busiest, and the Metro-North, which consists of the Harlem, Hudson, New Haven, and the Hoboken-Port Jervis lines. It is shown that the distance component of the MTA commuter railroad pricing structure is fair: riders who travel longer distances pay a higher fare in relation to the benefits they receive from the incremental distance they travel; and it is efficient: the charges are related to the additional cost of carrying riders further distances. Peak-period pricing is another efficiency-based strategy that theoretically would move riders who have a choice to the off peak, thereby rationing expensive peak capacity to those who are most willing to pay for it. The current commuter railroad peak pricing policy has not charged the peak-period rider in accordance with efficient resource allocation. Restructuring of the relative prices of the different tickets along with offering a viable off-peak alternative for monthly commuters would go a long way toward pricing the peak riders in relation to the actual costs they impose while offering a workable off-peak alternative. The alternatives that are examined are those that are operationally feasible.

Kessler, DS Simonsen, W (Metropolitan Transportation Authority)  
Transportation Research Record No. 912, 1983, pp 22-27, 3 Fig., 3 Tab.

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25 380876

**TRAVELCARDS PROVE JUST THE TICKET!**

The author describes how travelcard systems, competitively priced, go anywhere tickets, valid for periods between one week and one year, have given a new boost to the consumer market. A summary is given of the various types with examples from a variety of operators. The results from seven surveys showed that 75 per cent of users renewed their cards regularly and that economy was the main reason for purchase. Avoidance of the need to find change for the exact fare was also a significant factor. The main journey purpose was for work and only a third of all purchasers had a full driving licence. In some areas twice as many females as males held cards and over one half of the survey respondents had increased their trips since purchase. Travelcards are most appropriate with a conventional tapered fare structure, and thus tend to benefit most those travelling longer distances. In the UK the current policy of limited subsidies favouring a tapered fare structure, travelcards give some of the benefits of off-vehicle ticketing normally associated with flat-rate fares. South Yorkshire PTE, employing a low fares policy does not offer a travelcard but has a concessionary price for a set of pre-paid tickets. (TRRL)

Blumfield, R Akins, S (Southampton University, England) Surveyor  
Vol. 161 No. 4747, June 1983, pp 19-20, 1 Tab., 3 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 271188)

ORDER FROM: Specialist and Professional Press, Surrey House, 1 Throwley Way, Sutton, Surrey SM1 4QQ, England

25 381024

**EVALUATION OF THE DENVER RTD OFF-PEAK FREE FARE TRANSIT DEMONSTRATION**

This report presents findings of the evaluation of the Denver Colorado Regional Transit District's systemwide off-peak free fare transit demonstration. The demonstration began on February 1, 1978, and continued for 12 months, ending on January 31, 1979. The Denver RTD eliminated the 25 cent off-peak fare and retained a 50 cent peak hour fare for bus boardings for two hours during the morning rush hours and for two hours in the evening rush hours. This experiment in innovative transit pricing continued for one year as a Federally assisted demonstration project to determine the effects of free off-peak transit in a major urban area. This report summarizes the evaluation of the Denver experiment with respect to the implementation requirements of no fare off-peak bus service and its effects on: 1) travel behavior and transit's share of metropolitan tripmaking; 2) quality of bus service; 3) transit costs and revenues; and 4) indirect effects on the environment, energy consumption, and public support for transit. The extensive data collection activities conducted by RTD as part of the demonstration, including transit operations monitoring, surveys of transit

users on-board and follow-up telephone, and general population surveys, are documented and their results analyzed. Principal findings of the evaluation are reported and their implications for transit pricing and service planning are discussed. The principal conclusion of this evaluation is that free fare transit may be a more effective short-term marketing instrument than a desirable permanent element of transportation policy for metropolitan areas. Reduced or low fare off-peak transit may achieve many of the same beneficial objectives of no fares, but complete removal of the fare barrier appears to generate enough undesirable side effects to undermine its overall effectiveness.

Donnelly, RM Ong, PM Gelb, PM  
De Leuw, Cather and Company, Urban Mass Transportation  
Administration, (TSC-DTS-243) Mar. 1980, 215p Contract 1409-15B  
ORDER FROM: NTIS PB83-250795

25 381025

**A STUDY OF PRICING STRUCTURES AND FARE COLLECTION SYSTEMS FOR INTEGRATED LOCAL TRANSIT SYSTEMS**

One way to reduce inconvenience, and thus increase ridership, is to integrate the transit systems of a metropolitan area. Routes can be co-planned for easier rider transfers and cost savings may result from the elimination of redundant routes. Integrated fare collection may be easier for riders and save the systems collection expense as well. The purpose of this report is to address several issues in the fare setting and collection of integrated systems. Three interconnected aspects of the pricing of integrated transit systems are examined: These are: 1) the methodology for pricing transit trips within an integrated system; 2) the fare collection methodology for an integrated system; 3) the revenue allocation among participants in an integrated system. Information was gathered from publications and officials of transit properties in six metropolitan areas. A list of critical pricing considerations in integrated systems is developed based on suggestions in the literature and officials' opinions. Basic fare collection methodologies are discussed, and the flash pass/magnetic strip system is recommended for many integrations. A framework for assessing revenue-cost distribution models is developed. The report concludes with the presentation and demonstration of a process model for making fare decisions for integrated systems.

Logar, CM Pitman, G Rinks, DB Scherr, FC  
West Virginia University, Urban Mass Transportation Administration  
Final Rpt. UMTA-WV-11-0003-83-1, Jan. 1983, 122p Contract WV-11-0003

ORDER FROM: NTIS PB83-252403

25 381041

**PERFORMANCE ASSESSMENT METHODS AND RESULTS FOR TRANSIT AUTOMATIC FARE COLLECTION EQUIPMENT**

This report presents performance assessment methods for transit automatic fare collection (AFC) equipment. The methods developed are based on the experience gained from a series of performance assessments that have been undertaken at eight U.S., and three foreign transit systems. The report is intended to assist rail transit systems in their assessment of equipment, promote uniformity in applications, improve communications, and help achieve a better understanding of problems and issues. The development effort has been conducted as part of the UMTA Rail Transit Fare Collection (RTFC) Project. The overall goal of the RTFC project is to aid in the development of improved AFC systems for rail transit. The expected benefits from the project include improved operating efficiency and reduced labor and maintenance costs at the transit systems. The report represents a source document for assessment methodology. It defines key AFC terms and concepts, describes rail transit AFC systems, presents and discusses performance methods, as well as the results of the systems assessments and industry AFC contract specifications. Also included in the report is a discussion of the requirements for interfacing AFC information with the UMTA Transit Reliability Information Program (TRIP).

Morrissey, J  
Input Output Computer Services, Incorporated, Urban Mass  
Transportation Administration, (TSC/DTS-65) Final Rpt. UMTA-MA-06-0025-83-9, DOT-TSC-UMTA-83-25, Oct. 1983, 180p Contract  
DOT-TSC-1669

ORDER FROM: NTIS PB84-122522



25 381444

**MARGINAL COST PRICING OF SCHEDULED TRANSPORT SERVICES**

The article demonstrates the direct use of a demand function in a marginal cost pricing scheme for scheduled passenger transport. The basis of the development and generalisation by Jansson of the theory of optimal bus fares, set forth by Turvey and Mohring, is that the total transport cost, on which marginal cost is calculated, should include users' cost as well as producers' cost. Marginal cost pricing will then usually imply that fares will be set below producers marginal cost. As a consequence, the producers' of scheduled passenger transport will run at a financial deficit if they adhere to that pricing policy resulting in a public subsidy being needed to cover losses. By working directly from a demand function and a producers' cost function, it may be possible to evaluate more clearly the marginal cost pricing of scheduled transport services.

Larsen, OI *Journal of Transport Economics and Policy* Vol. 17 No. 3, Sept. 1983, pp 315-317, 2 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272594)

ORDER FROM: Bath University, England, Claverton Down, Bath BA2 7AY, England

25 381456

**THE USE OF SOME NEW SEASON TICKETS IN THE NETHERLANDS**

In the last couple of years Netherlands Railways (NS) have introduced some new season tickets to stimulate train use. (1) the "NS-Jaakaart" (price dfl. 2.592), an annual season ticket. (2) the "OV-Jaarkaart" (price dfl. 2.883), a combined annual train, tram and bus ticket. At (relatively) small extra cost you can get a season ticket for the other members of your household:-the "NS-Kortingkaart" (price dfl. 405), an annual discount pass (reduction : 50% single, 40% return and 30% on normal season tickets) (Author). For the covering abstract of the seminar see IRRD 272882.

Transport Economics. Proceedings of Seminar P held at the PTRC 10th Summer Annual Meeting, University of Warwick.

Klok, M (Ministry of Transport & Public Works, Netherlands) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* 1982, pp 143-154, 10 Tab., 3 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272893)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

25 381466

**FURTHER DEVELOPMENTS IN THE PRICING OF LOCAL PUBLIC TRANSPORT**

The article supplements and updates earlier work by the author which described the situation concerning public transport services in Britain for 1980, with examples from other countries. This article updates the position regarding four main issues: (a) impact of the Transport Act 1980 in Britain, which has virtually removed fares control from stage carriage services, and removed all price and quantity control from express services by road. (b) further development of zonal pricing, travelcards and off-bus fare collection on urban systems, and the effects of price reductions (and subsequent increases) in London, West Midlands, and Merseyside. (c) problems concerning the legality of financial support for fares policies in British cities. (d) following a presentation of work arising from the earlier paper at the meeting of the Transportation Research Board in Washington DC, in January 1983, the contrast between British and American policy is reviewed, with the writer's personal view on current policy there. In addition, evidence on certain other points in the text is updated. (TRRL)

White, PR (Polytechnic of Central London) *Transport Reviews* Vol. 3 No. 4, Oct. 1983, pp 329-340, 31 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272582)

ORDER FROM: Taylor and Francis Limited, 4 John Street, London WC1N 2ET, England

25 381490

**MAKING TRANSIT PASSES VIABLE IN THE 1980'S**

Transit passes were instituted at most transit agencies as marketing tools in the 1970's. Funding constraints of recent and future years have led many agencies to reconsider the viability of passes, but the more basic question of what is meant by viability must be posed. Certainly, with transit publicly

operated, the answer cannot be phrased only in financial terms. The popularity of transit passes infers that doing away with them will not be politically feasible. So the operative message or real answer to the question, "Are transit passes viable?", is that the current task that transit agencies face is how to make them viable. Prior to elaborating on particulars of the Fare Cutter Card or permit approach, which is perhaps the most effective step that can be taken to improve pass programs, this paper describes a broader framework for contemporary re-design of pass programs. GBTD's "pricing management" demonstration program has attempted to very carefully and critically assess the national experience with passes, and most other cases resolution of what had been accepted as inevitable contradictions or limitations of pricing mechanisms.

Oram, RL (Greater Bridgeport Transit District) *Transitions* 1983, pp 40-52, 4 Fig.

ORDER FROM: ATE Management and Service Company, Incorporated, Editor, 617 Vine Street, Suite 800, Cincinnati, Ohio, 45202

25 381535

**THE DB'S UNIFIED FAA-MOFA SYSTEM (AN AUTOMATIC TICKET VENDING MACHINE)—ITS IMPORTANCE FOR THE MOFA SYSTEM [DER EINHEITS-FAHRAUSWEISAUTOMAT FAA-MOFA DER DB UND SEINE BEDEUTUNG FUER DAS SYSTEM MOFA]**

The MOFA ("modernized ticket sales") system has been developed to speed up and simplify the issue of tickets by automatic vending machines. It is particularly suitable for regional traffic for which it covers 70% of sales. Automatic vending machines are micro-processor controlled: they are equipped with an automatic filling device for small change and a dot printer. The main feature of the MOFA system is the modular structure of the equipment. [German]

Feiter, M Schuster, E *Elektrische Bahnen* Vol. 81 No. 6, June 1983, pp 199-203, 2 Phot., 9 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: ESL

25 381675

**THE EFFECT OF RECENT LONDON TRANSPORT FARES CHANGES**

Following the successful introduction of flat fares on buses in outer London in April 1981 the GLC approved further proposals for the simplification of London Transport fares over the greater London area as a whole. These were implemented in October 1981 and were associated with a general 30% reduction in bus and underground fares. The most radical aspect of the scheme involved the creation of four bus zones across London with a fare for travel anywhere within a zone of 20p. Travel for two is 30p and three or more 40p. On the underground two central area zones were created but elsewhere graduated rail fares were retained but at approximately 25-30 per cent lower. A comprehensive programme has been set up to monitor the effects of the 4th October changes. The paper covers the major aspects including: (a) receipts and passenger effects-elasticity implications-bus pass take-up-changes in bus travel patterns resulting from zonal structure; (b) operational implications-bus passenger boarding times-ticket office queues in central area underground stations; (c) impact on different socio-economic groups. The attached appendix identifies these areas, the surveys being undertaken and time scales. Finally the paper considers possible further stages in the integration and simplification of London bus and rail fares in future including the creation of integrated passes for use on bus and underground. (Author/TRRL)

Public Transport. Proceedings of Seminar M held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Collins, PH (London Transport Executive) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* 1982, pp 41-54, 6 Fig., 6 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 272837)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

25 381676

**ANALYSING BUS PATRONAGE: THE EFFECTS OF FARES, SERVICES AND UNEMPLOYMENT IN WEST YORKSHIRE PTE'S "METROCAST" MODEL**

The ability to predict with reasonable accuracy future levels of passengers and their associated revenue is a key requirement of policy makers facing decisions on service, fare and revenue support levels. This paper describes work undertaken at WYPTE to develop a predictive model sensitive to external changes in the economy as well as to the key internal factors of fare and service level. So far the model embraces the 54% of passengers paying a fare on the PTE's directly-operated services (the predominantly urban routes in Leeds, Bradford, Huddersfield and Halifax). Passenger categories not yet covered are those paying a fare on NBC services (27%), non-farebox passengers (notably travelcard users) (15%), and those using rail (3%). The model requirements of aggregate demand forecasting, coupled with the availability of four-weekly time series data for revenue, bus-miles etc, make the technique of multiple regression analysis an obvious choice of method. The paper highlights the importance of using accurate data, a requirement perhaps more easily met by in-house research, and of determining the appropriate form of model, where data availability, statistical tests, economic theory and ease of prediction govern the choice of variables and the form in which they are used. Since the method employed is well established, the main interest probably centres on the results which, expressed as fare and service elasticities, are broadly consistent with other studies. However, fresh ground may have been covered in the analysis of exogenous demand determinants. In addition to real earnings (which is of minor significance) and a time trend (included to embrace any factor not specifically analysed) the model identified unemployment as a major influence on patronage. Both the absolute level and the change in level are considered to affect demand, the former perhaps as a reflection of the level of employment and of income (as distinct from earnings), while the change in unemployment has been included specifically to provide a good local proxy for short-time working, which is regarded as a short-term maladjustment of labour supply to demand. Reconciliation of the individual findings with generalised cost and various available statistics is discussed. After further consideration of fares, where evidence is sought for a shifting elasticity, money illusion and non-reversible effects, the final section of the paper considers applications of the model. Primarily employed to forecast short and medium-term aggregate demand and receipts levels, the limitations of overall fare and service elasticities are stressed. The model can also explain the changes in the pte's past patronage levels, distinguishing in particular between external and internal factors. Finally implications for optimal fare and service levels at given revenue support levels are discussed. (Author/TRRL)

Public Transport. Proceedings of Seminar M held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Fisher, RM Grimshaw, FR Tebb, RGP (West Yorkshire Passenger Transport Executive) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 55-66, 4 Tab., 11 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 272838)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

25 382235

**EVALUATION OF ELECTRONIC REGISTERING FAREBOXES**

This report presents the findings of an evaluation of electronic registering fareboxes in use at four transit systems: Dallas Transit, Phoenix Transit, Southeastern Pennsylvania Transportation Authority, and the Metropolitan Suburban Bus Authority of East Meadow, New York. Performance measures were developed to assess farebox accuracy, reliability, maintainability, security and installation and operating costs. Data collected from the transit systems in each of these areas is presented along with discussions of the types of problems which have been experienced with the electronic registering fareboxes to date. This study is one element in an UMTA-sponsored program to achieve more uniform data collection, analysis and reporting among the transit systems and to improve communications about fare collection problems.

Booz-Allen and Hamilton, Incorporated, Urban Mass Transportation Administration, (DTS-65) Final Rpt. UMTA-MA-06-0120-83-2, DOT-TSC-UMTA-83-53, Jan. 1984, 118p, Figs., Tabs., 2 App. Contract DOT-TSC-1744

ORDER FROM: NTIS PB84-156652

25 382292

**MAINTENANCE OF AUTOMATIC TICKET VENDING MACHINES CONTROLLED BY MICRO-COMPUTER AND OPERATING IN THE DIALOGUE MODE [VERKEHRSTECHNOLOGISCHE WARTUNG VON MIKRORECHNERGESTEUERTEN FAHRKARTENAUTOMATEN, DIALOGBETRIEB]**

In order to ease the sale of tickets from booking windows and improve customer service, the DB is now using automatic ticket vending machines controlled by microcomputers and operating in the dialogue mode. Passengers are therefore faced with an entirely new form of ticket purchasing system and the railway with specific maintenance requirements. The author describes the maintenance needed and assesses the maintenance workload for this type of vending machine. [German]

Rohland, W **Eisenbahn-Praxis** Vol. 27 No. 2, Apr. 1983, pp 59-64, 4 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD ORDER FROM: Transpress VEB Verlag fuer Verkehrswesen, Franzoesische Strasse 13/14, Postfach 1235, 108 Berlin, East Germany

25 382767

**OPTIMUM FARES FOR BUS SERVICES IN NON-METROPOLITAN AREAS**

Until recently bus subsidy policies were decided on largely non-political grounds. Of late questions of bus subsidy levels and fares structures have become controversial first in London and the metropolitan counties and more recently in the shire counties. This paper argues that questions of fares policy are susceptible to cost-benefit analysis techniques similar to those used in highway appraisal. Although such techniques are often thought to be too complex, this is shown to be not the case if simplifications are applied that are valid in all but the most heavily congested areas. Using these techniques, the optimum fares structure for a given network of services and a fixed level of subsidy is derived. Also obtained is the marginal ratio of benefit to subsidy so that the value for money of the subsidy can be compared with that obtained from alternative forms of expenditure. The results point to the desirability of retaining the existing concept of a scale of fares related to the distance travelled at the same level on all routes. On the other hand, there should be greater use of discriminatory pricing between different types of passengers and at different times. Conclusions are reached as to the optimum level of concessionary fares. An important implication is that an economic case for cross-subsidy between route is indicated. (Author/TRRL)

Public Transport Planning and Operation. Proceedings of Seminar L held at the PTRC 11th Summer Annual Meeting.

Sugden, J (Cleveland County Council) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1983, pp 89-98, 2 Fig., 1 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 273501)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

25 382768

**PRICE ELASTICITY: A CASE STUDY**

This paper aims to illustrate the effects of a change in policy from one of attempting to match farebox revenue to costs to one of attempting to maximise use of public transport within a context of constant fares. First it examines the economists concept of elasticity of demand and its uses and then looks at evidence from passenger transport operations of real elasticity values. The paper then compares the results of a case study with values expected from previous results and attempts to explain any differences which arise. The case study looks at the city of Kingston upon Hull where there was a change of fares policy in 1980. The study is made within the context of trying to define elasticity values. It looks first at an individual fare change and then examines the time series of data between 1976 and 1982 which illustrates quite clearly the differing effects on passengers and revenue of the two fares policies. It finds a long-term price elasticity value, looks at the effects of real price increases and decreases and illustrates the effects of this on the revenue showing that the constant fares policy is now producing a consistent increase in revenue. Finally the paper looks at the policy implications of such results, bringing costs into the picture to show some of the costs and benefits of the two-types of fares policy examined. It

finishes by pointing to areas where further research is needed to assist policymakers in their decisions. (Author/TRRL)

Public Transport Planning and Operation. Proceedings of Seminar L held at the PTRC 11th Summer Annual Meeting.

Rogers, DA (Kingston Upon Hull City Transport) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1983, pp 69-87, 2 Tab.**

ACKNOWLEDGMENT: TRRL (IRRD 273500)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

25 382769

#### THE EFFECTS OF SIMPLIFIED FARE STRUCTURE AND TICKETING IN URBAN PUBLIC TRANSPORT OPERATIONS

Study of the fare structures and fare collection methods used by urban public transport in the United Kingdom and elsewhere reveals enormous differences in policy. British operators tend to prefer "graduated" fares with several fare values, whilst on the European mainland and in the United States simpler flat or zonal structures dominate. Similarly, off-vehicle ticketing (travelcards and multiride tickets) is a much more common form of fare collection abroad than in Britain. Much of the explanation for this situation lies in the apparent conviction held by British operators that any deviation from the policy of graduated fares paid in single cash amounts would involve a loss of revenue and/or ridership. Very little research has been done to determine the effects of fares and ticketing simplification upon UK-type operations, and results tend to be inconclusive when viewed collectively. This paper reviews experience gained from the monitoring of a simplified fare and off-bus ticketing experiment in Plymouth—a city of 250000—during early 1982. Following this, a model has been developed which tests the revenue and ridership consequences of a wide range of fare structures. Passenger response to the different structures is derived by applying a range of elasticities to the fare changes pertinent to individual passenger categories. Overall findings from both the Plymouth experiment and the simulation exercise indicate that with careful design and pricing, simplified fare structures and ticketing need not cause major financial loss. Important advantages can be gained in terms of operating and cost savings and ability to market a product which is simple and convenient to use. However, flat fares consistently yield less revenue for a given fare level than zonal or graduated ones. (Author/TRRL)

Dawes, AC (Loughborough University of Technology, England);

Kilvington, RP (Oxford University, England) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1983, pp 55-67, 7 Tab., 12 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 273499)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

25 382771

#### MARKETING BUS TRAVEL BY PRE-PAYMENT FARE SCHEMES—AN ASSESSMENT OF THEIR IMPACT

In recent years public transport operators have initiated a variety of schemes where people purchase their tickets prior to travel. This paper examines some of the objectives claimed for such schemes. It considers the two main types of prepayment ticket: travelcard, which generally gives unlimited travel within a defined area and time of validity; and multi-ride tickets, which provide for a fixed number of rides. The paper concentrates largely on greater Manchester PTE, whose prepayment ticketing schemes comprise "Saver Seven", a weekly or monthly travelcard, and "Clipper Card", a 10 trip multi-ride ticket. The effectiveness of these tickets is examined by considering the levels of ticket sales and market penetration. The types of user and nature of the journeys made are examined. Such tickets enable a sales strategy based on market segmentation and offer the opportunity for differential pricing. By considering the response to changes in the price of such tickets and in the general level of fares an estimation is

made of the price elasticity for prepayment travel. The revenue implications for operators of prepayment in the short term is examined using this information. Such "costs" are compared with the benefits arising from faster boarding times and improved cash flow and revenue security. Conclusions are drawn regarding the relative merits of the different types of prepayment scheme to the operator, the travelling public, and in terms of wider transport policy goals. These are related to the type of use made of such tickets and the policy followed in relation to their sale. (Author/TRRL)

Public Transport Planning and Operation. Proceedings of Seminar L held at the PTRC 11th Summer Annual Meeting.

Boyle, RM (London Borough of Camden); Ling, DJ (University of Manchester Inst of Science & Tech) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1983, pp 99-116, 4 Fig., 5 Tab., 21 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 273502)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

25 382774

#### DEMAND FOR PUBLIC TRANSPORT IN THE NETHERLANDS [DE VRAAG NAAR OPENBAAR VERVOER]

The last few years have shown increasing energy prices and growing deficits in government budgets. In this context the sensitivity to price changes of the demand for public transport seems to be of special interest. The question arises whether the large deficits of public transport can be diminished effectively by raising the fares. Another interesting question is how fuel prices affect the modal choice of members of car-owning households. The present article gives the results of an analysis of the demand for public transport based on aggregate time series data over the post-war period. Different demand functions were developed for railways, urban transport and inter-urban bus services. The specification that was chosen offered the possibility of implicitly estimating the shares of "captive" and "non-captive" passengers. The results in terms of price elasticities show that fare increases are an effective instrument to diminish deficits. Furthermore it was found that fuel prices only have a positive effect on the demand for public transport by rail. Growing car-ownership will in general make this mode of transport more sensitive to price changes. (Author/TRRL) [Dutch]

Roodenburg, HJ (Centraal Planbureau) **Tijdschrift voor Vervoerwetenschap Vol. 19 No. 1, 1983, pp 3-15, 4 Fig., 2 Tab., 11 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 273412), Institute for Road Safety Research SWOV

ORDER FROM: Netherlands Institute of Transport, Polakweg 13, 2288 GG Rijswijk, Netherlands

25 384640

#### PRICING POLICY FOR PUBLIC TRANSPORT. THE CASE OF RATP [LA POLITIQUE TARIFAIRE DES TRANSPORTS EN COMMUN. LE CAS DE LA RATP]

This question is examined by the RATP Director General under two aspects: a) financial considerations (statutory procedures for fixing and monitoring fares, general fares level, current financing sources, financing policy, future fares structure) and b) development of public transport (aims of the fares policy, fares structure, contribution of the different fares categories to revenue, evolution of the fares structure, etc). [French]

Essig, P **Transports No. 287, Oct. 1983, pp 469-482, 6 Tab., 3 Phot.**

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: Editions Techniques et Economiques, 3, rue Soufflot, 75005 Paris, France

26 380132

**FIRE SAFETY IN TRANSIT SYSTEMS FAULT TREE ANALYSIS**

Fire safety countermeasures applicable to transit vehicles are identified and evaluated. This document contains fault trees which illustrate the sequences of events which may lead to a transit-fire related casualty. A description of the basis for their development and an explanation of their intended use are included as well as information on basic fault tree construction and symbol terminology. All factors, including human events and environmental and materials qualities, may be presented in a systematic manner by using a fault tree. Each event, or sequence of events, can then be examined to identify appropriate countermeasures and to evaluate the effect of potential countermeasures in minimizing or eliminating a fire threat. The diagrams can also be used as: An educational tool to explain fire propagation and occupant evacuation; an aid in developing vehicle procurement specifications; an aid for the vehicle designers; an aid in developing preventive maintenance and repairs; and an aid in developing emergency response and evacuation procedures.

Hathaway, WT Flores, AL Markos, SH Goldberg, MK Dinkes, IM  
Transportation Systems Center UM147-PM-81-51, Sept. 1981, 72p,  
Figs., 2 Tab., 8 Ref.

ORDER FROM: TSC

26 380164

**WMATA BIENNIAL SAFETY PERFORMANCE REPORT FOR JULY 1983**

This is the first semiannual report on safety at WMATA and provides a record of bus, rail and construction safety performance from 1974 through May 1983. Safety data sections contain a comprehensive record of all bus and rail passenger and traffic accidents and of construction accidents. WMATA employee injuries from January through May of 1983 are also included. The report shows that bus, rail and construction accident rates have been significantly reduced over the period covered by the report and that the safety performance of Metrorail continues to be the best in the industry. Fewer on-board and station accidents occur with WMATA passengers and employees than with any other major rail system in the U.S.

Washington Metropolitan Area Transit Authority Report No. 1, July 1983, 18p, 7 App.

ORDER FROM: Washington Metropolitan Area Transit Authority,  
600 5th Street, NW, Washington, D.C., 20006

26 380786

**FIRE SAFETY**

British Railways has up to 90 passenger train fires per year resulting from causes such as underfloor diesel engines, vandalism, electrical faults, and sparks from brake shoes. After a fatal fire in a sleeping car in 1978, major changes were made to a new series of such cars to assure greater safety. Fires on rapid transit cars are also discussed. First criterion in fire safety is resistance to ignition where laboratory tests may not give a picture of what happens in a large-scale fire. Fire-load density provides the basis for full-scale tests of ignitability inside an actual vehicle. The mechanics of the fire on a London Transport rapid transit train are discussed. Main risk to life in train fires is not flame but the combustion products which can suffocate by excluding breathable air, poison the passenger with toxic gases, or produce harmful physiological effects. A major source of smoke and harmful gases is the insulation on electric cabling. The low-smoke, zero halogen type insulations have been copied in the case of seat cushions. Third main area of activity in fire prevention is in designing trains to minimize the effects of fire. Should the designer provide for the maximum credible accident or prepare for the ultimate fire?

Modern Railways Vol. 40 No. 422, Nov. 1983, pp 574-575, 1 Phot.

ORDER FROM: Allan (Ian) Limited, Terminal House, Shepperton  
TW17 8AS, Middlesex, England

26 381526

**FIRE PREVENTION IN METRO CARS [VORBEUGENDER BRANDSCHUTZ AN U-BAHN-SCHIENENFAHRZEUGEN]**

Fire prevention in metro vehicles is not at present satisfactory. Cases of arson could endanger passengers' lives and destroy rolling stock. It would be extremely expensive to fit out coach interiors with non-inflammable

materials. A more viable alternative would be to install an efficient and economic sprinkler system. Tests carried out by Hamburg Hochbahn Ltd. have shown that fires started deliberately can be put out with very little water and very little damage except to the seats that were set alight. [German]

Albert, H Nahverkehr Vol. 1 No. 4, 1983, pp 66-71, 13 Phot., 1 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Nahverkehr, Duesseldorf, West Germany

26 381543

**TECHNOLOGY UPDATE: FIRE SAFETY**

Reviews various criteria of fire safety and materials used in rolling stock, cabling, etc.

Modern Railways Vol. 40 No. 422, Nov. 1983, pp 574-575, 3 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Allan (Ian) Limited, Terminal House, Shepperton  
TW17 8AS, Middlesex, England

26 381558

**RAILROAD ACCIDENT REPORT—FIRE ONBOARD AMTRAK PASSENGER TRAIN NO. 11, COAST STARLIGHT, GIBSON, CALIFORNIA, JUNE 23, 1982**

About 1:35 a.m., on June 23, 1982, Amtrak passenger train No. 11, the Coast Starlight, with 307 persons onboard and consisting of 10 cars operating on Southern Pacific Transportation Company track, stopped at Gibson, California, after fire and dense, heavy smoke was discovered in a sleeping car. The passengers in two sleeping cars were evacuated. As a result of the smoke and fire, 2 passengers died, 2 passengers were injured seriously, and 57 passengers and 2 train crewmembers were treated for smoke inhalation. Five persons were admitted to the hospital. Damage was estimated at \$1,190,300. The National Transportation Safety Board determines that the probable cause of this accident was the lack of effective response to suppress a fire, in bedroom No. 1 of car No. 32010 (1130), and the continued operation of the heating-venting-air conditioning system which resulted in propagation of the fire and smoke. Contributing to the loss of life, injuries, and damage were the lack of definitive emergency procedures and inadequate training for onboard Amtrak service and supervisory personnel and Southern Pacific Railroad Company operating crewmember in fire emergency procedures and the evacuation of passengers. Also contributing to the loss of life, injuries, and damage was heavy and toxic smoke generated by the combustion of flammable materials, such as plastics and elastomers.

National Transportation Safety Board NTSB/RAR-83/03, Apr. 1983,  
79p

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26 382228

**EVALUATION OF RAILS PRODUCED BY A VARIETY OF STEELMAKING AND CASTING PROCESSES. VOLUME I—MACROSCOPIC AND MICROSTRUCTURAL CLEANLINESS**

A partial metallurgical analysis was performed on rails produced by the Wheeling-Pittsburgh Steel Corporation. These rails were produced by both the open-topped and hot-topped ingot methods. Although cast from the same heat, it was found that rails from the hot-topped ingot had no primary or secondary piping, whereas those from the open-topped ingot had both primary and secondary pipes. Volume 2 of this report contains the photographs illustrating the microstructural cleanliness qualities of the rail samples.

Association of American Railroads Technical Center Res Rpt. R-559,  
Aug. 1983, 90p, 66 Fig., 7 Tab., 1 Ref.

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26 382251

**FROM RECOGNITION TO ALARMING-FUTURE CREW WARNING AT THE WEST GERMAN RAILROAD SYSTEM (DB) [VON DER ERKENNUNG BIS ZUR ALARMGEBUNG-DIE ZUKUNFTIGE ROTTENWARNUNG BEI DER DEUTSCHEN BUNDESBAHN]**

Within DB and on international level efforts are undertaken to increase automation and the development stage of crew warning installations. A description is given of the existing development and the special problems of technical warning systems for track maintenance workers. The actual state of the art, the experiences and future activities are explained. [German]

Lengemann, L (Bundesbahn-Zentralamt, Munich, West Germany)  
**Elektrische Bahnen** Vol. 81 No. 6, June 1983, pp 204-209, 1 Ref.

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

26 382295

**ORE. QUESTION A 158—INDIVIDUAL WARNING SYSTEMS FOR PERSONNEL WORKING ON THE TRACK**

After introductory remarks the operational, ergonomic, technical as well as the safety and reliability aspects of an individual warning system for personnel working in the track area are considered. Possible solution variants for the establishment of a complete individual warning system are described on the basis of the analysis of these four main aspects.

International Union of Railways ORE A 158/RP1, Apr. 1983, 47p

ACKNOWLEDGMENT: International Union of Railways, BD  
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26 382601

**INTERNATIONAL REPORT ON THE PREVENTION AND SUPPRESSION OF DUST IN MINING, TUNNELLING AND QUARRYING (6TH): 1973-1977**

This is a report on developments in occupational health protection against dust hazard in mining, tunnelling and quarrying from 1973 to 1977—reports on technical aspects, research, occupational safety practices (incl. labor inspection, safety education and safety committees), etc.; and comments on labor legislation and regulations.

North American Continent sales only available from NTIS. All others send to International Labour Office, Publications Department, CH 1211 Geneva 22, Switzerland.

International Labour Office 1982, 166p

ORDER FROM: NTIS PB84-132422

26 384606

**THE TRANSPORT SCENE-PROBLEMS AND PROSPECTS**

The article contains the opening keynote address to the conference, "Transportation", organised by the American Institute of Transportation Engineers, held in London, August 1983. The speaker firstly reviewed the key roles of the transport and highway engineer in deciding upon the best use of available resources. He then examined the way in which road transport has become the dominant mode. Britain now has 80 vehicles per mile of road compared with 48 in France and 43 in the United States. Safety is the most unsatisfactory aspect of road transport: in Britain, one in 10000 of the population is killed on the roads each year and one in 5000 in the United States. Railways are the safest means of travel; travel by private car is 12 times less safe than travel by bus and three times less safe than scheduled airlines in terms of distances. Accidents could be reduced by eliminating known black spots; by improved vehicle design and by building more motorways where the accident rate is one tenth of the rate per vehicle mile on other roads. Traffic flows can be improved by the provision of highways controlled by advanced system geared to requirements. All services should be safe, reliable and available at tolerable prices. Good service is the responsibility of those providing it. There is much to be done on the maintenance and improvement of standards of the road system, in

traffic management and in the improvement of the efficiency of all road vehicles. (TRRL)

Masefield, P **Highways and Transportation** Vol. 30 No. 11, Nov. 1983, pp 22-28

ACKNOWLEDGMENT: TRRL (IRRD 274894)  
ORDER FROM: Institution of Highways and Transportation, 3 Lygon Place, Ebury Street, London SW1, England

26 384622

**STATISTICAL MODELING OF RAILROAD SAFETY PERFORMANCE**

In recent years the Department of Transportation and the Association of American Railroads have become concerned over the safety performance of this nation's railroads. Recent statistics showed that the frequency of accidents was alarmingly high. Acting on this concern, the D.O.T. asked the Ballistic Research Laboratory to determine how railroads could be made safer. One approach to this problem would be to develop a mathematical model which would allow a railroad's safety to be expressed as a function of safety program characteristics. In this manner, guidelines for spending which could improve a railroad's safety record would be established. Several statistical techniques, including Cluster analysis, Discriminant Analysis, and Multiple Linear Regression, were employed in the development of this mathematical model. The model is a good predictor for the years 1976-1979, and should assist railroads in developing guidelines for spending which should improve their safety performance.

Botd, BA Thomas, J  
Army Armament Research and Development Center ARBRL-MR-03311, SBI-AD-F300 342, Sept. 1983, 36p

ORDER FROM: NTIS AD-A134 737/6

26 384895

**RIDE QUALITY METER**

A ride quality meter is disclosed that automatically transforms vibration and noise measurements into a single number index of passenger discomfort. The noise measurements are converted into a noise discomfort value. The vibrations are converted into single axis discomfort values which are then converted into a combined axis discomfort value. The combined axis discomfort value is corrected for time duration and then summed with the noise discomfort value to obtain a total discomfort value.

Field 22 May 81 patented 8 November 83. Supersedes PAT-APPL-6-267 129, N81-31848 (19-22, p3107). This Government-owned invention available for U.S. licensing and, possibly, for foreign licensing.

Leatherwood, JD Dempsey, TK Clevenson, SA Stephens, DG  
Langley Research Center PATENT-4 413 522, NASACASE-LAR-12882-1, No Date, 11p

ORDER FROM: Commissioner of Patents, Washington, D.C., 20231

26 384897

**STUDY OF SMOKE DETECTION AND FIRE EXTINGUISHMENT FOR RAIL TRANSIT VEHICLES**

This document presents the results of a study to determine the feasibility and cost effectiveness of the use of heat/smoke/fire sensors and automatic extinguishing systems in rail transit vehicles. Work presented includes: a survey of major rail transit systems to determine their fire experience, a survey of available hardware, determination of placement, review of cost effectiveness, and an outline of a testing program to validate conclusions of the study.

Mniszewski, K Campbell, J  
IIT Research Institute, Transportation Systems Center, Urban Mass Transportation Administration Final Rpt. UMTA-MA-06-0153-83-3, DOT-TSC-UMTA-83-13, Aug. 1983, 140p Contract DTRS-57-81-C-00124

ORDER FROM: NTIS PB84-142652

27 382233

**CASE STUDIES OF TRANSIT SECURITY ON BUS SYSTEMS**

The purpose of this report is to provide information on a selection of bus transit security measures for use by transit systems in developing their security programs. The report examines the security measures used by the principal bus transit systems in each of four cities—Los Angeles, Detroit, Seattle, and Pittsburgh—and indicated the conditions under which they are most likely to be effective. Certain transit security measures are common to all four transit systems. All make some use of either a transit police force, or members of a local law enforcement agency. They also all use communications equipment installed in buses, and community programs or school programs. However, there are unique aspects to each city's program. Detroit has an undercover police operation which has been used as a model by many other cities. Los Angeles has several demonstration projects using sophisticated security equipment. Seattle has a stress-management program for its bus operators. Pittsburgh's system has a small police force which emphasizes a quick response to passengers' and operators' reports of problems as a means of heightening the deterrent effort. The report includes the following sections: an introduction to the problem of transit crime and the security measures taken to combat it; transit security programs in the four case study cities; a comparison of methods used to police bus transit systems; the surveillance and communications equipment used by the four transit systems; school and community education programs and training of operators; the comparative costs of security measures; the public's perception of transit crime; and the study's conclusion on the effectiveness of the measures.

Hargadine, EO

MANDEX, Incorporated, Urban Mass Transportation Administration  
Final Rpt. UMTA-VA-06-0088-83-1, Aug. 1983, 134p, 8 Fig., 13 tab.,  
13 Ref., 2 App. Contract DTUM60-81-C-71098

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27 382282

**FEAR OF CRIME AND FEAR OF PUBLIC TRANSPORTATION AMONG THE ELDERLY**

This transportation study for the elderly highlights the important role that transportation plays in the life of the elderly and investigates the problem of fear-of-crime and other fears as a barrier to public transit use. The purpose of the study was to identify and analyze problems regarding the elderly persons' use of public transit that often result in fear of transit and negative mind sets about public transportation. The specific objectives were to provide information about and solutions to the fear-of-crime problem and other fears of the elderly that relate to the use of public transportation. This project was performed in the summer of 1982 in Philadelphia, Pennsylvania, and is described along with the results and recommendations in this report. The study is an in-depth survey of a sample elderly (62+ years of age) transit users residing in Philadelphia. The survey instrument is designed to uncover the nature of the elderly's fear of public transit and to identify and evaluate possible solutions to this problem. The study focuses upon fear-of-crime vis-a-vis the elderly population, and how that fear relates to various aspects of transportation such as the type, purpose, location and time of the trip, and the interaction of these factors with characteristics of the elderly user (age, sex, health, and income). This study

of the elderly bus users in Philadelphia pointed to high levels of fear about crime on the streets, at the bus stops, and on the buses. Inadequate police protection and a lack of bus dependability were the two major problems identified in this study.

Patterson, AH Ralston, PA

Pennsylvania State University, University Park, Urban Mass  
Transportation Administration Final Rpt. UMTA-PA-11-0026-84-1,  
Apr. 1983, 50p

ORDER FROM: NTIS PB84-145739

27 382299

**CITIZEN PERCEPTIONS ON MASS TRANSIT CRIME AND ITS DETERRENCE: A CASE STUDY**

Crime against patrons of transit systems has become a major concern to transit administrators, government, the press and the public. Perceptions of crime, along with increasing fares and decreasing subsidies, are seen as dramatically affecting the viability of mass transit in many urban areas. This article reports on the level of transit crime fears in Detroit, rates of victimization and the extent to which such fears adversely affect ridership. It then determines the levels of public knowledge of, and acceptance of, the use of undercover police officers and various alternatives. Finally, it develops a survey instrument and establishes a data base to allow consistent future studies.

Austin, TL Buzawa, ES *Transportation Quarterly* Vol. 38 No. 1,  
Jan. 1984, pp 103-120

ORDER FROM: Eno Foundation for Transportation, Incorporated,  
P.O. Box 55, Saugatuck Station, Westport, Connecticut, 06880

27 382596

**VANDALISM IN METROPOLITAN RAILWAYS**

The UITP International Metropolitan Railways Committee had the Stockholm transit agency conduct a survey of UITP members on the problems and effects of deliberate damage to cars and facilities. This report summarizes the 23 replies received from around the world. There is a general description of the answers to the questionnaire, a list of members replying and some facts about them, and lists of the most common and most costly types of vandalism. The present state of vandalism and its countermeasures are discussed. Vandalism is found to have effects on ridership. The laws applying to rapid transit systems and their policing are described along with the effects of vandalism on cars, stations and operations. Most transit agencies have publicity and educational programs to combat vandalism. Technical developments tend toward implementing rigorous anti-vandalism measures in designing cars and stations. Closer supervision by both police and the traffic staff are seen as deterrents.

UITP *Revue* Vol. 32 No. 4, 1983, pp 351-356, 7 App.

ORDER FROM: International Union of Public Transport, Avenue de  
l'Uruguay 19, B-1050 Brussels, Belgium

28 380218

**MARKETING ASPECTS OF LOCAL PUBLIC TRANSPORT SYSTEMS IN HIGH-DENSITY POPULATION AREAS**

An efficient local public transport system is indispensable for the proper functioning of high-density population areas. It is not sufficient, however, to just offer an attractive transport system; on the contrary, local public transport corporations will have to switch to an increasing extent to "marketing" their "product" accordingly against strong competition from private motor vehicles. Both in the commercial and local public transport sectors, one must implement sales-orientated company policies involving the conscious deployment of marketing instruments. Besides a constant attempt to develop the market segments "design and presentation of services" and "fares" further, and to find optimum solutions, considerable effort has to be invested in the "sales and distribution" and "information" sectors. In this context, local public transport corporations should by no means be treated as "no-name" enterprises (i.e. "faceless" bodies), but as branded products that have to satisfy the quality demands expected by the customer. This is of particular importance if a high degree of efficiency is required. The difficulty in assessing the various marketing instruments is proving their success rate in individual cases. But even if it is hard to supply evidence of individual contributions towards success, the whole range of marketing instruments deployed has to lead to improved results. The task is to find the most effective combination of sales-promoting factors (marketing mix) and, bearing in mind the objectives, to deploy these to the best possible extent. [German]

Westphal, PJ *Eisenbahntechnische Rundschau* Vol. 32 No. 7-8, July 1983, pp 475-480

ACKNOWLEDGMENT: British Railways

ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

28 380246

**CORRECT POSITIONING OF THE LOCAL PUBLIC TRANSPORT SERVICE OFFER ON THE MARKET: A JOB FOR THE COMMERCIAL DEPARTMENTS [DAS ANGEBOT DES OEFFENTLICHEN PERSONENNAHVERKEHRS AUF DEM MARKT RICHTIG PLAZIEREN: EINE AUFGABE DES ABSATZES]**

The different sales functions such as market research, pricing policy, sales promotion and advertising must also be applied in short distance public passenger transport even if the objective varies somewhat in this area from the objectives in the other DB sectors essentially governed by commercial criteria. The policy will centre on offering a mode of transport which meets requirements better than any other, at attractive prices. [German]

Friedrich, W *Die Bundesbahn* Vol. 59 No. 4, Apr. 1983, pp 223-226, 3 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

28 380895

**DAVENTRY MAKES CONCESSIONS ON BUS FARES**

A description is given for some of the marketing techniques used by Northamptonshire County Council in Daventry to encourage increased bus ridership. Following the introduction of cheap day return fares (accompanied by a publicity leaflet distribution scheme), a survey was carried out six weeks later showing a 10% increase in the number of people travelling to Northampton and a 16% increase in numbers making trips solely within Daventry. It was found that the publicity leaflet had more effect than the fare reduction. Ridership has undoubtedly been increased by the fares experiment and an alternative experiment to increase ridership at a lower cost per extra journey than the first phase is to be tried for a further three months. The first phase demonstrated how difficult it is to change peoples' travelling habits and how selective marketing can have wider effects. (TRRL)

Porter, JS (Northampton County Council) *Surveyor* Vol. 162 No. 4756, Aug. 1983, pp 8-9, 1 Tab., 3 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 271637)

ORDER FROM: Specialist and Professional Press, Surrey House, 1 Throwley Way, Sutton, Surrey SM1 4QQ, England

28 381510

**A CONSUMER-ORIENTED TRANSIT INFORMATION SYSTEM**

The major objective of this study is to develop a systematic method of obtaining and utilizing consumer measures to make better transit planning and management decisions, that is, to design a component of a management information system that presents marketing information to a transit manager periodically. The program itself was designed for the non-programmer and its displays for the decision-maker. Use of the program system is self-explanatory. A copy of the computer programs and test data are available from the author. This report presents the results of an effort to implement a consumer measures information system in a small urban area—High Point, North Carolina. The system was designed to periodically report the travel patterns and viewpoints of transit riders. Practical elements of the design of the system are discussed including use of interactive microcomputers to analyze results, survey techniques, selection of consumer measures, system measures, and applicability of various indicators to decision making. Initial results indicated the availability of this information to be an effective aid to transit management at both the policy and operations level. The report includes an evaluation of the utility of various indicators and measures as reported by agency personnel. Recommendations for implementation of such systems at other sites are included. During the case study, the suggested methodology for developing a consumer-oriented transit information system gave rise to practical issues and are presented in this report.

Benjamin, J

North Carolina Agricultural and Technical State U, Urban Mass Transportation Administration Final Rpt. UMTA-NC-11-0009-83-7, Sept. 1983, 92p

ORDER FROM: NTIS PB84-131929

28 381628

**THE USE OF CONJOINT ANALYSIS IN TRANSPORT RESEARCH**

Conjoint analysis is a technique developed through the course of the 1970s for use in market research. It is a technique in which respondents are asked to state their preferences for alternatives which offer various combinations of system attributes. The scope of conjoint analysis as a means of understanding the importance of specific aspects of a transport product is considerable. Following a brief review of the development of the technique over the last 10 years, the authors describe two research applications for which they have been responsible. In the first, conjoint analysis was used to identify demand elasticities with respect to service frequency, and as a by-product of the main research programme, to estimate values of time. In the second project, conjoint analysis was used to establish passenger preferences for some detailed aspects of vehicle design in respect of seating layouts, smoking restrictions and so forth. For each case the type of statistical design deployed is described and what are seen as essential features of the conjoint technique are identified. Comparisons are made with some research which has certain similarities which has been conducted by SNCF in France. Based on the general principles enunciated, a description is given of the scope and limitations of the technique in the transport research and planning fields. (Author/TRRL)

Transportation Analysis and Models. Proceedings of Seminar Q held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Sheldon, RJ Steer, JK (Steer, Davies and Gleave Limited) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* 1982, pp 145-158, 1 Tab., 14 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272778)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

28 381637

**THE USE OF POSTCODES FOR TRANSPORT SURVEY ANALYSIS**

Postcodes have been recognised as an efficient zonal identifier in transportation studies. As they are based on postmen's delivery rounds, the likelihood of error is negligible. Work on the regional highways traffic model in the mid 1970's recognised this feature, and the Department of Transport has made an agreement with the post office to provide extracts of the central postcode directory free of charge to local authorities for the purposes of transport planning. The paper will describe work currently being carried

out by Durham County Council in the field of survey analysis using postcodes. There are three main types of survey presently in hand: (I) a journey-to-work survey by self-completion questionnaire at the place of work for three major employers in the city of Durham, (II) the optimisation of scholars transport within the overall framework of stage carriage and contract operations, (III) home interview survey for assessing the demand for bus routes on new housing developments. All three types of survey are amenable to the use of postcodes for analysis, and such techniques readily lend themselves to the use of computer graphics, particularly the flat-bed plotter for the production of map overlays showing the geographical distribution of home addresses, for example. In the case of scholars trips, superimposition of the stage carriage bus services enables the method to be used as an accounting tool as well as a transportation model. (Author/TRRL)

Transportation Analysis and Models. Proceedings of Seminar Q held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Hamilton, TD Gardiner, MD (Durham County Council) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 259-270, 3 Fig., 1 Tab., 14 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 272787)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

### 28 381638

#### THE USE OF GEOGRAPHIC DATABASES IN TRANSPORT PLANNING: PUBLIC TRANSPORT AND OTHER APPLICATIONS

The paper reports work carried out in the Department of Engineering Tyne and Wear County Council, on the use of geographic databases in a transport planning context. The specific application reported is the creation of an analytic public transport network model from published bus maps via a geographic database. The coding method used in this application is unusual in that bus service data is coded directly from the bus map to a link base, and full bus route data for individual services are recovered, validated and edited by sophisticated post-processing techniques. The database on which the methods rest is described, an outline of the methods used presented, and their use and output compared with both conventional methods of network generation and with a modified conventional method previously developed in Tyne and Wear which is geocoded but is not designed around a database. Examples of other applications of database-related methods in transport planning, including methods for highway network generation and for recording and processing idiosyncratic (e.g. Surveyed or sign-posted) routes through networks are outlined. (Author/TRRL)

Transportation Analysis and Models. Proceedings of Seminar Q held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Riley, M Taylor, JD (Tyne & Wear County Council) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 271-287, 11 Fig., 1 Tab., 10 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 272788)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

### 28 381673

#### USER VIEWS ON LEVELS OF SERVICE

The subject of public transport has become increasingly important because of the cost of fuel and increasing congestion in the cities. The attraction of the private car is so great that severe difficulties have prevented the solution of the urban transport problems through the use of other modes, in particular the bus, hence the interest in developing techniques for an appropriate planning, design and operation of bus systems. The work described in this paper explores the possibilities of applying the user opinion of the quality of service provided on a particular route, as the basis for designing standards to regulate it. The underlying interest in using the approach based on the user reported opinion was to ascertain the "explicit acceptability" of the service by the user, instead of the acceptability implicit in demand elasticity approaches. The former approach should be useful in situations where the user, at least in the short term, appears to be captive of public transport. A survey was therefore made in order to contrast the user opinion of the overall quality of service versus the measured values of

several trip attributes. The results of the survey showed, with a high level of significance and a moderate linear correlation, that changes in the user opinion may be explained by changes in trip attributes. Moreover, the results confirmed what has been observed in empirical studies, namely that waiting time is the dominant explicative variable among trip attributes. The approach used in the study proved to be useful in developing operational standards for bus routes and to assess the level of service provided on different routes. (Author/TRRL)

Public Transport. Proceedings of Seminar M held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Wormald, EM (Oficina Metropolitana De Planeamiento Urbano);

Osuna, EE (Instituto De Estudios Superiores De Administracion) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 15-25, 2 Fig., 17 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 272835)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

### 28 381678

#### FUTURE USE OF STAGE BUS SERVICES

The reason underlying the decline of stage bus services in the UK over the past 30 years seems to be well understood, and the likely future trends can be projected using a quantitative forecasting model. The model considers UK bus services at a very aggregate level, but it breaks the demand into specific user groups: work trips, children's travel, travel by the elderly, and all other travel, and separately for households with and without a private car. Forecasts depend very sensitively on the level of economic growth assumed, since this governs the two major factors underpinning public transport use-car ownership and the cost of operating the services. If the economy could recover its historic growth rates a further substantial decline in bus use seems inevitable under most realistic assumptions, but with the present economic outlook a lower growth rate seems likely to persist for some time, and in this case public transport use will become much more stable in the 1990's, and large increases in fuel prices may even encourage some resurgence. Many of the metropolitan counties have adopted policies of strongly restraining future rises in fares, in some cases to the extent of freezing fares in monetary terms. The effects of such policies on both patronage and subsidies are considered here, and although much of the current political attention is focussed on controlling fares, the question of balance between fares and service levels is also discussed. Lastly, it must be admitted that these predictions are based on knowledge which is largely restricted to the short-term effects of transport policies. The nature of our uncertainty about longer-term effects, and the possible size of them, is considered in terms of sensitivity testing of the prediction model. (Author/TRRL)

Public Transport. Proceedings of Seminar M held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Bly, PH Oldfield, RH (Transport and Road Research Laboratory) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 99-111, 5 Fig., 6 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 272842)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

### 28 381685

#### A NEW APPROACH TO MARKET RESEARCH IN PUBLIC TRANSPORT

Since the title of the paper was decided the research has progressed to the stage where it now encompasses the complete marketing framework for public transport. There are three principal elements to the package: the club concept in which by appeal to self-interest, members of the public can be induced to give us their names, addresses and travel information-the widespread use of a dedicated credit card such as those now being found commonly in department stores and many other outlets-the use of the computer to register journeys, prepare accounts, analyse bus use, encourage sales. The paper will give only the briefest possible outline of what it is intended to develop. The technology is based on fully tried and tested basic material. The sales methods are new to public transport but are common in many consumer fields. All that is necessary is to put these together with sufficient enthusiasm. The ultimate development of the techniques described is to provide a complete package for rational decisions on the whole urban transportation network, including roads. (Author/TRRL)



Public Transport. Proceedings of Seminar M held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Browning, PJ (Council for Scientific & Industrial Res S Africa)  
**Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982**, pp 193-201

ACKNOWLEDGMENT: TRRL (IRRD 272849)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 28 382585

**A COMPARATIVE STUDY OF PUBLIC TRANSIT PROMOTION**  
Public transit properties, often with federal support, have been experimenting with promotional activities to improve their public image and the level of service offered. This paper describes the findings from a comparative evaluation of the effectiveness of various promotional techniques under a wide range of operating conditions. The research results are segmented into the following three categories: 1) promotional fares, 2) special services and 3) advertising, community relations and public information. Each of these categories is further divided into the institutional, operational and economic issues involved in the promotional technique. Although some transferable results are reported, the most important finding is the lack of systematic planning and evaluation of promotional instruments in the transit industry, making it difficult to assess the value of implementation. This is particularly true in the areas of advertising, public information and community relations. The sources of this problem are discussed and suggestions are made to improve future applications of promotional instruments.

Abkowitz, M Driscoll, M  
Rensselaer Polytechnic Institute, Urban Mass Transportation Administration Final Rpt. NY-11 0026, Feb. 1984, 57p, Figs., Tabs., 3 App. Contract NY-11-0026  
ORDER FROM: NTIS PB84-159094

#### 28 382622

##### **AN EVALUATION OF THE EXTENT TO WHICH TRANSIT PROPERTIES CONSIDER MINORITIES IN MARKETING ACTIVITIES**

The purpose of this study was to analyze specific marketing activities of five selected transit properties to determine their effects on minorities. The five properties were in Fayetteville, Raleigh, Charlotte, and Wilmington, North Carolina and in Richmond, Virginia. All the sites had populations ranging in size from 50,000 to over 480,848 with not less than 20 percent Black representation. An attempt was made to explore how marketing decisions are made by some specific transit properties and to ascertain the extent to which transit managers consciously consider minority concerns when they make the following marketing decisions: 1) establishment and modification of routes and schedules, including special cases such as weekends and holiday; 2) establishment and implementation of promotional structures, including advertising, publicity, and sales promotion; 3) determination of minority companies, including geographical distribution and lifestyles; and 4) establishment or modification of price structure, including levels of fares, discounts, transfers, zones, revenue relationships, and special fares for minorities; and 5) data collection procedures, including appropriate provisions for obtaining complete and relevant data pertaining to minority needs and concerns. Using in-depth interviews, data were collected from transit managers or their designees in the five sites. Surrogate group leaders of Black organizations were also interviewed. An analysis of the data from the five cities showed that there were limited special efforts to include minorities (Black) in marketing activities beyond routes and scheduling. At the turn of this study there were no Blacks on policy-making bodies other than on the City Council in Wilmington. The authors note that Black representation on policy-making bodies does not automatically mean equity for Blacks. Transit awareness among Blacks seems to be highest in the areas of routes, schedules, and fares. The report indicates that transit marketing decisions are not always aimed at special group minorities (Black) because they are likely to be in the captive audience. Few Blacks have an extensive knowledge of the transit decision or policy-making process. Generally, communication techniques continue to be used, partly because of the lack of an effective evaluation program. The report concludes that since the sample involved in this study was judgemental and this study was exploratory, no generalizations can be made based on these findings. Consequently, some site-specific observations, rather than conclusions, seem more appropriate.

Gibbs, M  
North Carolina Agricultural and Technical State U, Urban Mass Transportation Administration Final Rpt. UMTA-NC-11-0009-83-6, Sept. 1983, 101p Contract NC-11-0009  
ORDER FROM: NTIS PB84-126663

#### 28 382848

##### **TRANSFER PRICE DATA-ITS USE AND ABUSE**

A transfer price is a measure of the strength of a consumer's preference for one option over another. It can be directly obtained by asking the consumer what change in price would cause him to transfer to a new option. The theoretical advantages of the technique over conventional, dichotomous, revealed preference data are contrasted in discussion with the potential unreliabilities and biases inherent in this type of data. It is argued that the biases are likely to be complex but less marked here than in other stated intention data. Examples of the use of the technique in Great Britain, Australia and the USA are presented and discussed in order to highlight important issues in the design and conduct of transfer price experiments. Analysis of some recently collected data suggests that this type of data can contribute to improved understanding of the nature of decision making; some evidence of non linearity, habit thresholds, unsymmetrical response surfaces and non compensatory behaviour is highlighted. (Author/TRRL)  
Transport Planning Methods. Proceedings of Seminar N held at the PTRC Summer Annual Meeting, University of Sussex, England, 4-7 July 1983.

Bonsall, PW (Leeds University, England) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P243**, 1983, pp 47-59, 1 Tab., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 273138)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 28 382849

##### **RECENT EXPERIENCE WITH MODELS FITTED TO STATED PREFERENCE DATA**

Although it has long been accepted practice to calibrate models to data relating to choices actually made by survey respondents, there has recently been interest in techniques where respondents are presented with hypothetical situations and asked how they would behave, thus getting them to "state" their preferences, rather than "reveal" them, as in traditional economic analysis. Methods using stated preference data have been widely applied in market research but have not been applied extensively in transport modelling. The major problems which confront the modeller when making use of such data are firstly the extent to which the data can be treated as reliable, and secondly the statistical basis of the model to be fitted. As far as the latter is concerned, recent work in the field of discrete choice models has led to a considerable improvement over earlier methods developed within the field of market research. As far as the first problem is concerned, there is a clear need for some validation of the results derived from stated preference data, and in particular a comparison with results derived from revealed preference data. The authors have been addressing this problem by including hypothetical questions in traditional transportation surveys, and calibrating compatible models on both types of data for the same subset of respondents. (Author/TRRL)

Transport Planning Methods. Proceedings of Seminar N held at the PTRC Summer Annual Meeting, University of Sussex, England, 4-7 July 1983.

Bates, JJ (John Bates Services); Roberts, M (Mva Consultancy)  
**Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P243**, 1983, pp 61-82, 7 Tab., 5 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273139)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 28 384597

##### **CAR OWNERSHIP VERSUS PUBLIC TRANSPORT AND CUSTOMER PROVISIONS [AUTOBEZIT VERSUS OPENBAAR VERVOER EN KLANTENVOORZIENINGEN]**

Groups of five areas with good, reasonable and moderate quality of public transport and customer provisions have been compared. Customer provisions were specified on neighbourhood, district and above-district level. For public transport there were criteria like spatial coverage, mode, frequency,

walking distance etc. Areas with good public transport and customer provisions showed 20% less car ownership than areas with moderate levels. This corresponds with the 1975 data of the West Yorkshire Transportation study. The authors draw some conclusions in the planning and policy field. (Author/TRRL) [Dutch]

Korpershoek, GJA (Nederlandse Spoorwegen); Prah, S (Haskoning)  
**Verkeerskunde** Vol. 34 No. 11, Nov. 1983, pp 538-541, 1 Fig., 8  
 Tab., 1 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273668), Institute for Road  
 Safety Research SWOV

ORDER FROM: Royal Dutch Touring Club ANWB, Wassenaarseweg  
 220, P.O. Box 93200, The Hague, Netherlands

**28 384898**

**PUBLIC MASS TRANSPORTATION'S SERVICE TO  
 COMMUNITY COLLEGE AND VOCATIONAL-TECHNICAL  
 STUDENTS IN PADUCAH, KENTUCKY**

This study focused on the utility of small transit systems to students attending colleges or vocation-technical schools in small communities. The study examined two populations: a group of post-secondary transit commuters in Paducah, Kentucky observed between September, 1982 and May, 1983, and a broader sample of experience with fifty randomly-selected transit systems serving communities under 100,000 across the United States. Evidence from the two samples indicates that this is a fairly important potential market for transit which has not been emphasized in literature to date.

Stice, DL

Paducah Area Transit System, Office of the Secretary of  
 Transportation Final Rpt. DOT-SRP-83-1, July 1983, 99p

ORDER FROM: NTIS PB84-142660

29 380188

**TRANSIT INFORMATION AND TRANSIT KNOWLEDGE: THE CHICAGO EXPERIENCE. FINAL REPORT**

This report addresses several questions regarding the manner in which information on transit systems is prepared, disseminated, and used by the public. Specifically, it includes an examination of the amount of information users and potential users have about transit systems and the subsequent ridership implications of this problem. This study focuses on the Chicago metropolitan area that is served by a dozen commuter rail lines operated by carriers whose fares and services are coordinated by the Northeastern Illinois Regional Transportation Authority (RTA). This rail system was selected because the service provided has been extremely stable. The report is organized into four sections: 1) an examination of the role of information in determining ridership responses to service changes; 2) a survey to determine how much users of one transit district know about another district; 3) a study to evaluate the usefulness of information aids; and 4) a test of alternative transit map designs. The findings suggest that substantial improvement can be made in information dissemination. At the root of the problem is the lack of knowledge among urban residents about the basic geography of the metropolitan area. Progress here requires long-term public education remedies, perhaps starting in elementary school. Short-term solutions include greater emphasis on consumer-oriented information aids. The author notes that the most noteworthy finding is that transit users quickly respond to changes in transit service. This may have long-term negative consequences on the role of transit beyond a worktrip service.

Soot, S Stenson, HH  
Illinois University, Chicago, Urban Mass Transportation  
Administration Final Rpt. UMTA-IL-11-0028-83-4, May 1983, 71p

ORDER FROM: NTIS PB83-262659

29 380189

**TRANSIT INFORMATION AND TRANSIT KNOWLEDGE: THE CHICAGO EXPERIENCE. EXECUTIVE SUMMARY**

This report addresses several questions regarding the manner in which information on transit systems is prepared, disseminated, and used by the public. Specifically, it includes an examination of the amount of information users and potential users have about transit systems and the subsequent ridership implications of this problem. This study focuses on the Chicago metropolitan area that is served by a dozen commuter rail lines operated by carriers whose fares and services are coordinated by the Northeastern Illinois Regional Transportation Authority (RTA). This rail system was selected because the service provided has been extremely stable. The report is organized into four sections: 1) an examination of the role of information in determining ridership responses to service changes; 2) a survey to determine how much users of one transit district know about another district; 3) a study to evaluate the usefulness of information aids; and 4) a test of alternative transit map designs. The findings suggest that substantial improvement can be made in information dissemination. At the root of the problem is the lack of knowledge among urban residents about the basic geography of the metropolitan area. Progress here requires long-term public education remedies, perhaps starting in elementary school. Short-term solutions include greater emphasis on consumer-oriented information aids. The author notes that the most noteworthy finding is that transit users quickly respond to changes in transit service. This may have long-term negative consequences on the role of transit beyond a worktrip service.

Soot, S Stenson, HH  
Illinois University, Chicago, Urban Mass Transportation  
Administration UMTA-IL-11-0028-83-3, May 1983, 8p

ORDER FROM: NTIS PB83-262642

29 380256

**PASSENGER INFORMATION SYSTEM AT STUTTGART MAIN STATION [DIE FAHRGASTINFORMATIONSANLAGE IM BAHNHOF STUTTGART HBF]**

At the main station of Stuttgart (West Germany), a passenger information system was put into operation in 1982. A dual computer system supplies the required data to four departure panels, one picture repetition memory with 20 video channels, and two double-faced train indicators at the 16 tracks. The panels and the train indicators are provided with drop shutters. They are controlled automatically from the computer system. Specific

signal criteria from the signal box are evaluated automatically and cancel the indications on the departure of a train. The picture repetition memory is required for the expansion of the TV system. In the future, 20 different pictures for passenger and internal railway information will be available. [German]

See also Vol. 81 No. 3, March 1983 issue of *Elektrische Bahnen*.

Petersen, Rainer (Standard Elektrik Lorenz AG) *Elektrische Bahnen*  
Vol. 81 No. 2, Feb. 1983, pp 39-42, 1 Ref.

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

29 380863

**DESIGNING AN INTEGRATED TRAVEL INFORMATION SYSTEM [NAAR DE OPZET VAN EEN GEINTEGREERD REIZIGERS INFORMATIESYSTEEM]**

This paper deals with the issue of providing integrated travel information, i.e. information concerning the travelling facilities for trips, for which the use of the services of different public transport operators is necessary. At present, travel enquiry clerks spend a lot of time in selecting the required information from the time tables. The paper sets out in detail how the traveller gets the required information at his disposal quickly by automation of the selection procedure. Special attention is paid to the algorithm, which selects the public transport connection from the time tables. In addition the consequences of setting up the system are mentioned and a few other possibilities for using the system are dealt with. The paper finishes with the consideration that setting up an integrated travel information system is advantageous for both the travellers and the public transport operators. The public transport operators should therefore consider whether the introduction of the system is realisable. (Author/TRRL) [Dutch]

Vanerslag, RT (Iwis-Tno)  
Colloquium Vervoersplanologisch Spuurwerk Colloquium 1982, 1983,  
pp 769-794, 4 Fig., 7 Tab., 4 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 270697), Institute for Road  
Safety Research SWOV  
ORDER FROM: Colloquium Vervoersplanologisch Spuurwerk, P.O.  
Box 45, Delft, Netherlands

29 380872

**AUTOMATIC DISPLAY OF DESTINATION ON PUBLIC TRANSPORT VEHICLES [AUTOMATISK FORDONSSKYLTNING. EN INVENTERING AV BEFINTLIGA SYSTEM OCH ELEKTRONISKA SYSTEM UNDER UTVECKLING]**

This report describes five mechanical and seven electronic display systems. The role of vehicle-mounted signs, how to define and express destinations and the legibility of various types of characters are discussed. The report indicates that non-electronic displays are still to be preferred on the exterior of the vehicles. Electronic systems may be used inside the vehicles, where reading distance is short and climate may be controlled. Gothenburg public transport will be trying various systems in field tests. (TRRL) [Swedish]

Kaabjoern, A (Goeteborgs Spaarvaegar); Wallin, B  
Kollektivtrafikberedningen, (0280-123X) KTB Rapport 1983:4, 1983,  
53p, 16 Fig., 1 Tab., 10 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 270947), National Swedish  
Road & Traffic Research Institute  
ORDER FROM: Kollektivtrafikberedningen, P.O. Box 1339, Solna,  
Sweden

29 380874

**TRAVELER PERFORMANCE AND INFORMATION AVAILABILITY: AN EXPERIMENT IN ROUTE CHOICE**

The ability of transit patrons to fully use a transit system depends on their ability to understand traveler information. Past studies indicate that travelers are often incapable of answering basic questions, such as "what are the names and numbers of the bus routes that pass nearest your home?" using available guides. An experiment was conducted to see how travelers' ability to understand transit information affects their performance in choosing travel routes. New students at a major university were observed as they traveled by foot or bus from the campus to a small library 1.5 miles

away. Those subjects supplied with maps reached the destination significantly faster than those given no transit information. However, subjects supplied with both schedules and maps were actually slower than those using maps alone. Results indicate that travelers are unable to adjust their routes in response to a bus schedule. Subjects also made mistakes reading maps that cost them travel time or walking effort. These results suggest that travelers need improved information, and that such improvements would produce tangible benefits (e.g. reduced travel time). (Author/TRRL)

Hall, RW (California University, Berkeley) **Transportation Planning and Technology** Vol. 8 No. 3, 1983, pp 177-189, 7 Fig., 1 Tab., 1 Phot., 14 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 271209)  
ORDER FROM: ESL

**29 381562**  
**ASSESSMENT OF TRANSIT PASSENGER INFORMATION SYSTEMS**

This report presents the results of an examination of transit passenger information system (TIS) with particular emphasis on the technology and operations necessary for delivering information to transit passengers over the telephone. The study examined the telephone information systems at three transit authorities, representing three categories of TIS: (1) simple, labor-intensive manual telephone system (Nashville-Davidson County Metropolitan Transit Authority); (2) computer-assisted manual system (Washington Metropolitan Area Transit Authority); and (3) automated system (Hamburg, Germany). Each of these systems is designed to provide transit users with answers to their inquiries. A description of how each of these systems work is presented together with information on system performance and system costs. In addition, descriptions of automated transit passenger information system installations in Ottawa, Ontario, Canada and Columbus, Ohio and of a computerized data storage and retrieval system in Minneapolis-St. Paul are presented. Other current developments in passenger and related information systems are reviewed.

Diewald, WJ Frost, WH Bamberg, W Lea (ND) and Associates, Incorporated, Urban Mass Transportation Administration Tech Rpt. NDL-41-VIII, UMTA-IT-06-0248-83-1, Mar. 1983, 173p Contract DTUM60-81-C-71089  
ORDER FROM: NTIS PB84-108117

**29 382775**  
**AN INTERACTIVE INFORMATION SYSTEM FOR PASSENGERS OF PUBLIC TRANSPORT [EEN INTERACTIEF INFORMATIESYSTEEM VOOR OPENBAAR VERVOER REIZIGERS]**

This report is the result of a study made to investigate the possibility of choosing the most favourable route between two places. The traveller's wishes involve mostly the time of departure, the time of arrival and the route which the passenger should use in order to avoid changing as far as this is possible. To answer the problem of choosing the shortest possible route a computer program has been developed. To further this development use has been made of a combination of various methods. The program developed consists of a main program, giving the shortest route. When used, the necessity of changing is reduced to a minimum. Secondary programs provide other relevant data. The demonstration system can be carried out on a PDP 11/20 computer which belongs to the laboratory of automatic traffic systems and which uses a normal terminal for i/o.(a) (Author/TRRL) [Dutch]

Elshabasi, H  
Delft University of Technology, Netherlands Monograph July 1982, 90p, Figs., Tabs., 41 Ref.

ACKNOWLEDGMENT: Institute for Road Safety Research SWOV (IRRD 273415), Institute for Road Safety Research SWOV  
ORDER FROM: Delft University of Technology, Netherlands, Centrum voor Vervoers en Verkeerswezen, P.O. Box 5038, 2208 Delft, Netherlands

**29 384615**  
**INFORMATION SYSTEMS FOR PUBLIC TRANSPORT CONTROLLERS AND PASSENGERS [TRAFIKLEDNINGS- OCH TRAFIKANTINFORMATIONSSYSTEM. EN KARTLAEGGNING]**

The primary task of public transport is to provide good service. This necessitates high vehicle and staff productivity without abandonment of good working environment. Great efforts have been made to increase speed, improve regularity and punctuality. In many cases, information to passengers leaves much to be desired, especially regarding hold-ups in traffic. It is important that passengers should be able to find out how long they have to wait and what is the best way to travel in different situations. Computerised information systems have been installed in some towns in various countries, and a review of these has been made. In Hamburg, passengers can ring a number or use automats on the streets. By punching in various codes and putting in 10 pfennig, the passenger gets information on time of next bus, journey time, any interchanges, and cost. In Mississauga, Canada, passengers can ring a computer with a combination of codes and receive information on times of next two buses at the appropriate stop. In Tokyo, information is displayed at bus stops concerning arrival time of next bus. (TRRL) [Sweden]

Pettersson, H-AA  
Kollektivtrafikberedningen KTB Rapport 1983:10, 1983, 32p, 7 Fig., 1 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 274409), National Swedish Road & Traffic Research Institute  
ORDER FROM: Kollektivtrafikberedningen, P.O. Box 1339, Solna, Sweden

**29 384890**  
**MECHANISED COMPILATION OF A PASSENGER INFORMATION HANDBOOK [OBTENCION MECANIZADA DE LA GUIA DE INFORMACION DE VIAJEROS]**

Presentation of a process for the mechanised compilation of a Passenger Information Handbook. This article refers only to passenger trains but it is also relevant to the compilation of passenger handbooks for any other form of transport i.e. road, air or sea transport. As far as the railways are concerned, it can apply to the Freight Information Handbook and even to the preparation of a Handbook covering several different modes of transport. [Spanish]

Dominguez, J Hernandez, A AIT-Revista No. 54, 1983, pp 12-19, 1 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Asociacion de Investigacion del Transporte, Alberto Alcocer 38, Madrid, Spain

31 380154

**SUMMARY OF OPERATIONAL CHARACTERISTICS AND ANTICIPATED EVALUATION OF I-66 HOV FACILITY**

In late 1982, the final section of I-66 in the Washington, D. C., suburbs in Northern Virginia was opened to traffic after a lengthy and controversial developmental process. The final product of that process is a four-lane, limited-access, parkway-type facility from which heavy-duty trucks are excluded at all times. Peak-period, peak-direction use is restricted to high-occupancy vehicles (HOVs), emergency vehicles and vehicles bound to and from Dulles Airport. Finally, to maintain safe and efficient traffic flows on the facility, a comprehensive, computer-controlled traffic management system (TMS) will be installed. Basic elements of the system include closed-circuit television, ramp metering, motorist advisory signing, and interface with adjacent traffic signal systems. The Virginia Department of Highways and Transportation, with funding from the Federal Highway Administration, has undertaken a study of this section of highway. The objective is to evaluate I-66 and the HOV restrictions and the TMS. The results of the study will prove valuable in assessing the merits of the concepts used and in planning projects of this nature. A summary of the history, design elements, operational characteristics, and anticipated evaluation of the final section of I-66 is presented.

This paper appeared in Transportation Research Record No. 906, Urban Traffic Systems.

Lantz, KE, Jr Arnold, ED, Jr (Virginia Highway & Transportation Research Council) **Transportation Research Record** No. 906, 1983, pp 26-33, 1 Fig., 1 Tab., 8 Ref.

ORDER FROM: TRB Publications Off DOTL JC

31 380157

**DEVELOPMENT OF AN INTERACTIVE PLANNING MODEL FOR CONTRAFLOW LANE EVALUATION**

Work undertaken to develop an interactive computer simulation model for assessing the impacts of contraflow lane projects along existing freeway corridors is described. The methodology presented assembles extensively used travel demand and traffic flow models into an integrated planning tool. The travel and flow characteristics of a corridor are processed, and the user is presented with a summary of the predicted changes. These submodels include the Greenshields linear speed-flow model, the California diversion model, and a multinomial and incremental logit model developed by Cambridge Systematics, Inc. The interactive nature of the package allows the transportation planner to perform the evaluation with a minimum of effort. An example based on data from Washington, D. C., is used for illustration.

This paper appeared in Transportation Research Record No. 906, Urban Traffic Systems.

Caudill, RJ Kuo, NM (Princeton University) **Transportation Research Record** No. 906, 1983, pp 47-54, 6 Fig., 2 Tab., 14 Ref.

ORDER FROM: TRB Publications Off DOTL JC

31 380158

**GARDEN STATE PARKWAY HOV LANE (ABRIDGMENT)**

Operation of a lane reserved for high-occupancy vehicles (HOVs) in each direction along 12 miles of the Garden State Parkway was studied. The HOV lane was established in November 1980 by addition of a lane in each direction to the existing six-lane divided and controlled-access roadway. Peak-period traffic flows before the addition of the HOV lane were characterized by levels of service D, E, and F along 5 or more miles of the road section that was widened. Information on numerous weekday peak-period traffic characteristics collected during the first year of HOV lane operation is reported. The definition of a carpool changed from three or more to two or more occupants in June 1981. A number of comparisons are presented for the two 6-month periods as well as for data collected before the HOV lane operation. Traffic before and after addition of the HOV lane was monitored for impacts of the HOV lane on HOV use, HOV and non-HOV travel time, automobile occupancy, person throughput, accident experience, HOV lane violations, and vehicle speeds. Results in terms of travel time, persons using HOVs, and accident data are reported.

This paper appeared in Transportation Research Record No. 906, Urban Traffic Systems.

Powers, JC (New Jersey Department of Transportation) **Transportation Research Record** No. 906, 1983, pp 54-56, 4 Fig.

ORDER FROM: TRB Publications Off DOTL JC

31 380171

**GUIDELINES AND STANDARDS FOR THE PLANNING, DESIGN, AND OPERATION OF BUS PARK-AND-RIDE FACILITIES**

A set of guidelines and standards for the planning, design, and operation of express bus park-and-ride facilities are presented. Their purpose is to ensure that facility development activities will fulfill local needs while supporting efficient bus transit operations. The guidelines and standards have been developed for and are being applied to a statewide park-and-ride facility development program being undertaken by the New Jersey Transit Corporation (NJ TRANSIT). The goal of NJ TRANSIT's park-and-ride program is to develop within each bus service corridor a network of properly sized parking facilities located to support efficient bus operations and convenient user access. Parking needs at comparatively low-demand boarding points are addressed through joint-use development, while higher-demand boarding points are served with exclusive use investments. Facility design standards ensure that park-and-ride facilities are safe, convenient, and easy to maintain. Exclusive-use facilities are designed to provide 15-20 years of low-maintenance service. NJ TRANSIT's park-and-ride program is a capital program and does not provide funds for facility operation. Operating costs are typically recouped through user fees. In cases where NJ TRANSIT does not operate a park-and-ride facility, operating oversight is maintained through a 15-to 20-year contract with the facility operator. This contract provides the user with a well-maintained facility at a reasonable cost.

This paper appeared in Transportation Research Record No. 908, Transit Terminal Facilities and Urban Rail Planning.

Mather, JJ (New Jersey Transit Corporation) **Transportation Research Record** No. 908, 1983, pp 1-6, 3 Ref.

ORDER FROM: TRB Publications Off DOTL JC

31 380174

**BUS TERMINAL PLANNING AND OPERATION AT THE 1982 WORLD'S FAIR**

The design and operation of charter and tour bus and shuttle bus terminals at the 1982 World's Fair in Knoxville, Tennessee, are described. Constraints governing the design principles are discussed and operation policies are defined. Each terminal required a different type of layout and operating concept because of land availability and differences in the loading and unloading requirements of users of the types of services offered. Operating labor requirements, other factors influencing cost, and flow rates actually achieved at each terminal are discussed.

This paper appeared in Transportation Research Record No. 908, Transit Terminal Facilities and Urban Rail Planning.

Miller, DR Reid, MJ (Barton-Aschman Associates, Incorporated) **Transportation Research Record** No. 908, 1983, pp 16-23, 3 Fig., 2 Tab.

ORDER FROM: TRB Publications Off DOTL JC

31 380176

**PARK-AND-RIDE AT SHOPPING CENTERS: A QUANTIFICATION OF MODAL-SHIFT AND ECONOMIC IMPACTS**

The purpose of this research was to quantify the effects of park-and-ride facilities at shopping centers on commuter travel and shopping behavior. A survey of commuters at three shopping centers in Montgomery County, Maryland, was conducted to estimate these impacts. The analysis demonstrated that there can be a significant economic benefit to shopping-center operators for allowing commuter parking to occur on their parking lot. Survey results indicate that between 25 and 45 percent of park-and-riders shop at the shopping center on a typical day on their way to or from work. Approximately two-thirds of this shopping activity is either diverted from other shopping locations or in newly induced shopping. For the shopping centers surveyed, the average increase in sales due to the presence of park-and-ride activity is \$5/park-and-day. Also, the presence of the park-and-ride facility, in itself, is responsible for 10-30 percent of the park-and-riders choosing to use transit or form a carpool.

This paper appeared in Transportation Research Record No. 908, Transit Terminal Facilities and Urban Rail Planning.

Smith, SA (JHK and Associates) **Transportation Research Record**  
No. 908, 1983, pp 27-31, 1 Tab., 1 Ref.

ORDER FROM: TRB Publications Off DOTL JC

**31 380202**  
**COMMUTERS RIDE THE RAILS INTO FIVE STATE**  
**CAPITALS**

The electrified suburban networks in Sydney, Melbourne and Brisbane are being expanded and reshaped for better distribution of passengers in the central areas; in Perth and Adelaide new or rebuilt DMUs handle the traffic.

**Railway Gazette International** Vol. 139 No. 8, Aug. 1983, pp 598-602

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

**31 380208**  
**TORONTO: THE SHOW ISN'T OVER**

The stable Province of Ontario government has provided generous support for Metropolitan Toronto's effort to expand and integrate all forms of public transit. Included is Toronto Transit Commission with a coordinated system of subway, streetcar and bus routes carrying 400 million riders annually and GO Transit which operates suburban services involving rail commuter lines and buses handling 23 million yearly riders. TTC is building an automated Intermediate Capacity Transit System (ICTS) which will extend service northeast from its west-to-east rapid transit line and is considering the building of a major new streetcar line. GO Transit will extend its Lakeshore commuter railroad service with Advanced Light Rapid Transit (ALRT) and plans other such lines eventually. Major equipment replacement programs will continue for TTC.

Malone, F **Railway Age** Vol. 184 No. 10, Oct. 1983, 2p, 1 Fig.

ORDER FROM: Railway Age, Subscription Department, P.O. Box 530, Bristol, Connecticut, 06010

**31 380216**  
**THE PASSENGER STATION AS A COMMUNICATION NODE.**  
**PROPOSALS FOR AN OPTIMUM DESIGN [VERKEHRSKREUZ**  
**PERSONENBAHNHOF. ANREGUNG FÜR EINE OPTIMALE**  
**GESTALTUNG]**

In order to make the railway service offer more attractive in the public's eye, it is important to stress train speeds and comfort. But it is also becoming increasingly important to offer good connections between rail and road services. Infrastructure should be adapted to this requirement which implies facilities for easy transfer from one mode to the other and a well organised information service for the public. [German]

Schalnat, A **Eisenbahntechnische Rundschau** Vol. 32 No. 4, Apr. 1983, pp 217-224, 3 Tab., 5 Phot., 6 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

**31 380245**  
**THE ROLE OF THE RAILWAY IN THE DESIGN OF LOCAL**  
**MASS PASSENGER TRANSPORTATION [DIE ROLLE DER**  
**BAHN IM KONZEPT DES ÖFFENTLICHEN**  
**PERSONENNAHVERKEHRS]**

As there is no monopoly in regional passenger transport, the railway is not controlled by State legislation in this area. Regional transport design should therefore be based on general economic factors and what is considered desirable. In heavily populated urban areas rail transport constitutes the backbone of the system; frequently however, buses or coaches are more attractive and economical. [German]

Zemlin, H **Die Bundesbahn** Vol. 59 No. 4, Apr. 1983, pp 217-218

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

**31 380248**  
**ORGANISING RAPID TRANSIT SYSTEMS ON THE BASIS OF**  
**COOPERATION BETWEEN TRANSPORT MODES [DER**  
**AUSBAU DER S-BAHN-SYSTEME UNTER DEM**  
**GESICHTSPUNKT DER KOOPERATION DER**  
**VERKEHRSMITTEL]**

Since the mid-sixties the DB has put into service about 1200 km of rapid transit lines (S-Bahn), laying the foundation for a fast and attractive transport offer and providing opportunities for improvement of cooperation between transport modes often resulting in an end-to-end transport system for users. [German]

**Die Bundesbahn** Vol. 59 No. 4, Apr. 1983, pp 231-238, 8 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

**31 380259**  
**URBAN PUBLIC TRANSPORT HAS A FUTURE**

An assessment is made of the advantages offered by electric rail systems for rapid transit within cities and metropolitan areas. Suburban commuting is also covered. Electric drives are the most favorable solution for urban transport systems because they are exhaust-free and quiet, subject to little wear and tear, and have a long service life. They are also highly efficient and reduce dependence on oil.

Kill, E **Siemens Power Engineering** Vol. 50 No. 2, Mar. 1983, pp 21-26

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**31 380780**  
**IS THE CLOCK RUNNING DOWN FOR U.S. RAIL**  
**COMMUTERS?**

The status of each of the rail commuter operations in the U.S. in 1983 is described. Details such as the responsible administration, operating agency, routes, mileage, equipment are listed for each metropolitan area having such service, followed by a general discussion including future prospects. The year was marked by the transfer of several Conrail-operated commuter services in the Northeast to local agencies, resulting in strikes by operating unions and marked decrease in ridership after service resumed. In other cases reduced funding and prospects for further cuts can affect the future.

Thoms, WE **Trains** Vol. 43 No. 12, Oct. 1983, pp 30-35, 11 Phot.

ORDER FROM: Kalmbach Publishing Company, 1027 North Seventh Street, Milwaukee, Wisconsin, 53233

**31 380797**  
**FEASIBILITY STUDY FOR THE CALHOUN STREET**  
**TRANSIT/PEDESTRIAN MALL**

The feasibility of a Transit/Pedestrian Mall on Calhoun Street in downtown Fort Wayne, Indiana is studied. The major purpose of the study is to define the geometric characteristics of Calhoun Street, the transit service plan for downtown, and the vehicle and transit operation strategy for Calhoun Street that supports the continued development of downtown Fort Wayne. The Downtown Development Plan for the City of Fort Wayne is presented. The traffic impacts of closing Calhoun Street are analyzed and a conclusion is reached that Calhoun Street can be closed to general vehicular traffic with some traffic engineering operational adjustments. Several transit operating strategies are developed and the most appropriate transit operating strategy for downtown Fort Wayne is selected. Mall alternatives are developed that address the vehicle and transit operating strategy for Calhoun Street and the geometric characteristics of Calhoun Street. An evaluation methodology is presented and used to select the preferred alternative for Calhoun Street. The economic impacts of the Calhoun Street Mall on Fort Wayne CBD retail sales are presented. Finally, the geometric and urban design of the recommended plan is presented along with the Financial and Management Plans for the Calhoun Street Mall. The conclusion of the study was that a Transit/Pedestrian Mall on Calhoun Street was feasible and a three block area of Calhoun Street should be designated for buses only.

Wolfsfeld, RP Heppelmann, AJ Amundsen, CA Harmon, RJ

Fort Wayne Public Transportation Corporation, Urban Mass Transportation Administration Final Rpt. Jan. 1982, 115p, Figs., Tabs. Contract IN-09-0031

ORDER FROM: Fort Wayne Public Transportation Corporation, 801 Leesburg Road, Fort Wayne, Indiana, 46808

31 380804

**EMPIRICAL EVIDENCE ON DETERMINANTS OF MASS BICYCLE COMMUTING IN THE UNITED STATES: A CROSS-COMMUNITY ANALYSIS (DISCUSSION AND CLOSURE)**

A nationwide study of determinants of mass bicycle commuting (10 percent or more of trips) is discussed. Numerous studies in specific cities and states have isolated important determinants of mass bicycle commuting, such as separation from high-speed, high-volume motor vehicle traffic and relative costs (including time). However, considerable political controversy exists over the proper policies for stimulating mass bicycle commuting, and no study systematically quantifies where mass cycling takes place in the United States or the correlates of mass cycling. Therefore, the data in this paper attempt to fill that research gap and reduce the area of policy controversy by reporting all the available examples of mass bicycle commuting in the United States. The data find almost 200 examples of mass cycling for educational institutions, but fewer than 10 examples of mass cycling to work and shopping destinations. Separation from high-speed, high-volume traffic correlates with mass cycling, although examples of mass cycling on wide moderate-speed, moderate-volume arteries exist. The relative cost of cycling, which includes time costs, correlates less strongly. However, correlation does not prove causation. The overwhelming majority of fatal accidents reported occurred on arterials and not on separate bicycle facilities or residential-type roads. Nevertheless, cycling appears to remain more hazardous than driving over a given route.

This paper appeared in Transportation Research Record 912, Economic Analysis of Transportation Problems.

Everett, MD Spencer, J (East Tennessee State University); Faust, S Transportation Research Record No. 912, 1983, pp 28-37, 6 Tab., 20 Ref.

ORDER FROM: TRB Publications Off DOTL JC

31 380852

**WILL MULTIMODAL PASSENGER TERMINALS HELP TO MEET OUR TRANSPORTATION REQUIREMENTS TO THE YEAR 2000?**

This paper describes the multimodal passenger terminal research undertaken by Transport Canada since early 1981; outlines recent Canadian activities in that area; and assesses the prospects of these terminals helping to meet our passenger transportation requirements to the year 2000 and beyond. Together, the intercity bus carriers and railway companies carry about 42 million passengers each year, and serve 3400 Canadian communities. In the last decades the market held by these public carriers has remained constant or declined. This small but significant market share has led some to question the current practice of providing separate intercity bus and rail facilities. Many Canadian communities lack adequate bus station facilities; many communities have antiquated, often oversized, railway passenger terminals. In planning and building our public transportation system to the year 2000, we can continue to make investments and improvements in terminal facilities on a unimodal basis, or passenger terminals can be constructed or renovated to serve more than one mode, i.e. Multimodal passenger terminals. (Author/TRRL)

Proceedings of the 18th Annual Meeting of the Canadian Transportation Research Forum, Regina, Saskatchewan, June 1983.

Darwin, E (Transport Canada) Saskatchewan University Printing Services Proceeding June 1983, 22p

ACKNOWLEDGMENT: TRRL (IRRD 270857), Roads and Transportation Association of Canada

ORDER FROM: Saskatchewan University Printing Services, Saskatoon, Saskatchewan, Canada

31 380867

**CONFERENCE ON PLANNING FOR PUBLIC TRANSPORT IN TOWN AND COUNTRY HELD AT THE UNIVERSITY OF NOTTINGHAM, MARCH 24-25 1983**

The following papers were presented at the conference: Public transport—the political context (Fry, PD); Passenger demand: Research and analysis

(Tyson, WJ); Development planning and public transport design (Scott Hellewell, D); Controlling the network by comprehensive co-ordination and financing (Lea, W and Archibald, NR); Meeting needs with minimal support through responsive planning and unconventional transport. Public transport in the shire counties (Hatt, MJ); A European approach to public transport -regional transport in the Netherlands (De Kogel, CG and Jacobs, JHG); The provision of public transport in a city without PTE status (Smith, DR); The survival and expansion of an independent operator in a Passenger Transport Executive area (McCloy, JM); Towards regional transport authorities (Taylor, HM). (TRRL)

Fry, PD (House of Commons); Tyson, WJ (Manchester University, England); Scott-Hellewell, D (South Yorkshire Pte); Lea, W Archibald, NR (Cheshire County Council); Hatt, MJ (Devon County Council); De Kogel, CG Jacobs, JHG (Ministry of Transport & Public Works, Netherlands); Smith, DR (City of Cardiff Transport); McCloy, JM (South Yorkshire Road Transport Ltd, Pontefract); Taylor, HM (Strathclyde Pte) Construction Industry Conference Centre Limited Monograph 1983, 112p, Figs., Tabs., Phots., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 270521)

ORDER FROM: Construction Industry Conference Centre Limited, P.O. Box 31, Welwyn, Hertfordshire, England

31 380869

**MINI COMPETITION CUTS BUS INCOME**

The article examines the current organisation of bus public transport services in South Africa. Of the 20000 buses in the country, the largest operator, PUTCO Ltd, operates 3500 single-deck buses on 665 routes providing commuter services for Durban, Pretoria and Johannesburg; a city which also operates its own municipal service. Other municipalities are served by subsidiaries of the privately-owned United Transport Group operating 1400 single deck buses. Another large operator is the government-owned South African Transport Services (SATS) involving passenger and freight transport services. In rural areas where branch railway lines are now covered by SATS operations, tractor-trailer combinations are employed hauling freight during the week with a passenger trailer attached for peak weekend traffic. Against this background the author discusses the effects of growing privately-owned minibus operations. It is considered possible that the development of such privately-owned transport operations is likely to put passenger safety at risk, as a result of cost-saving reduced maintenance, to gain passenger income at the expense of municipally subsidised users. (TRRL)

Dickson, LR Transport (London) Vol. 4 No. 3, May 1983, pp 33-36, 3 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 270526)

ORDER FROM: City Press Limited, Fairfax House, Colchester, Essex CO1 1RJ, England

31 380885

**TRANSFER OF PASSENGER TO RAIL SERVICES IN GLASGOW**

During 1980, on two recently opened railway improvement schemes in Glasgow, passengers were interviewed about their journey, to discover where passengers new to rail travelled from, and the method of travel used before the opening of the new services. The Argyle line added a new link to the British rail suburban network and tables and diagrams are presented to show the geographical location of trips diverting from bus and car. The survey estimated trips increased by 18 per cent, with the largest increases occurring for the more optional purposes of shopping and social activities. Generation of completely new trips was at most five per cent of weekday traffic, eight per cent on Saturday, being greatest for trips for social, recreational or "other" purpose. The Glasgow underground attracted 23 per cent of traffic from non-public transport modes or in the form of generated trips, with diversion from car occurring most often for shopping trips. Introduction of a multi-modal season ticket on British rail increased traffic by five per cent during the peak and four per cent off-peak. The main effect of a coordinated feeder-bus service on traffic at Drumchapel station was diversion of trips which would otherwise have used the through bus services to central Glasgow. (TRRL)

Hawthorne, IH

Transport and Road Research Laboratory, (0305-1293) LR 1074, 1983, 19p, 10 Fig., 11 Tab., 1 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 271547)  
ORDER FROM: TRRL

### 31 380886

#### SERVICE LEVELS OF URBAN PUBLIC TRANSPORT VOLUME I. THE CONTEXT OF THE STUDY

This volume describes the current situation of urban public transport in the Netherlands and conditions for state aid in covering the deficits. A standardisation system for urban transport is presented, based upon testing urban public transport on a network basis. The criterion used is the occupancy-rate, together with the planning constraints relating to the quality of the level of service. The terms of reference for the study on alternative methods for determining the level of service standards, in the framework of Dutch transport policy, is stated. For the other volumes of this series see IRRD 271268 to 271273. (TRRL)

See also IRRD 260054, TRIS 361462.

Ministerie van Verkeer en Waterstaat Monograph 1980, 38p, Figs., Tabs., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 271267), Institute for Road Safety Research SWOV  
ORDER FROM: Ministerie van Verkeer en Waterstaat, P.O. Box 20901, The Hague, Netherlands

### 31 380887

#### SERVICE LEVELS OF URBAN PUBLIC TRANSPORT VOLUME II. REPORT OF A ROUND TABLE MEETING

The present insights into the problems associated with the level of service in general are described. To this end six experts were invited to write conceptual papers on the methodological problems of setting and quantifying appropriate levels of service that both satisfy the demand for public transport and make a positive net social welfare contribution. They were also asked to consider approaches to subsidize the allocation in the event of a budget constraint. A summary of the discussion is given. The contributions of the experts are published unabridged. The titles of the contributions are: (1) justification and management of bus subsidies. (2) a procedure for determining the levels of service of public transport in the nine major cities in the Netherlands. (3) grant allocation and the standardisation of public transport service in Dutch cities. (4) analysis of alternative transit service policies for the Netherlands. (5) standard of service for urban public transport. For the other volumes of this series see IRRD 271267, 271269-271273. (TRRL)

See also IRRD 260054, TRIS 361462.

Garden, J MacKinlay, E Beesley, ME (London Business School); Buchanan Lewis, K (Colin Buchanan and Partners); Kemp, MA (Urban Institute); Mannham, ML (Cambridge Systematics, Incorporated); Roth, G (World Bank)  
Ministerie van Verkeer en Waterstaat Monograph 1980, 185p, Figs., Tabs., Photos., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 271268), Institute for Road Safety Research SWOV  
ORDER FROM: Ministerie van Verkeer en Waterstaat, P.O. Box 20901, The Hague, Netherlands

### 31 380888

#### SERVICE LEVELS OF URBAN PUBLIC TRANSPORT VOLUME III. FIRST INTERIM REPORT

The first interim report represents a summary of work and thinking so far. It draws attention to the changing structure of Dutch cities and indicates some of the problems associated with estimating and predicting demand for passenger transport. The different ways in which the level of service can be measured are then described and the relative merits of the available indicators considered. Finally the possible options for selection criteria are developed and discussed. Volume 3a contains the annexes to the first interim report. For the other volumes of this series see IRRD 271267, 271268, 271270-271273. (TRRL)

See also IRRD 260054, TRIS 361462.

Ministerie van Verkeer en Waterstaat, Institute of Public Administration, Nederlandse Economisch Instituut Monograph 1980, 68p, Tabs.

ACKNOWLEDGMENT: TRRL (IRRD 271269), Institute for Road Safety Research SWOV  
ORDER FROM: Ministerie van Verkeer en Waterstaat, P.O. Box 20901, The Hague, Netherlands

### 31 380889

#### SERVICE LEVELS OF URBAN PUBLIC TRANSPORT VOLUME IV. UTILIZATION BASED SYSTEMS FOR ALLOCATING TRANSIT SERVICE IN THE NETHERLANDS

The objective of the study was to design a system for determining the overall level of service for public transport in each Dutch city which is appropriate to city needs and characteristics, with the local authority retaining responsibility for routing and frequency of the network. The system should also make possible a specification of levels of service that can be accommodated within given budget allotments for public transport deficits. Within limited budgets the system should make the most effective use of funds while maintaining equitable distribution of service levels among local authorities. This report presents the general guidelines for the study and the issues to be examined. Three utilization-based systems are discussed: a system that allocates guilder subsidies according to changes in volume of ridership, a system allocating incremental service units according to changes in ridership volumes and a system that allocates subsidies according to changes in cost resulting from changes in ridership. For the other volumes of this series see IRRD 271267 to 271269, 271271 to 271273. (TRRL)

Ministerie van Verkeer en Waterstaat, Institute of Public Administration Monograph 1981, 93p, Figs., Tabs.

ACKNOWLEDGMENT: TRRL (IRRD 271270), Institute for Road Safety Research SWOV  
ORDER FROM: Ministerie van Verkeer en Waterstaat, P.O. Box 20901, The Hague, Netherlands

### 31 380890

#### SERVICE LEVELS OF URBAN PUBLIC TRANSPORT VOLUME V. SECOND INTERIM REPORT [VOORZIENINGEN NIVEAU OPENBAAR STADVERVOER DEEL V. TWEDE INTERIM RAPPORT]

The second interim report describes the elaboration of the cost-benefit method to a manageable system for determining the standards of service levels for urban public transport. The general guidelines of the system and theoretical and practical aspects of determining costs and benefits are presented. Some varying applications of the system are discussed. The annexes of the report are published separately in volume 5.a. For the other volumes of this series see IRRD 271267 to 271270, 271272, 271273. (TRRL) [Dutch]

See also IRRD 260054, TRIS 361462.

Ministerie van Verkeer en Waterstaat, Nederlandse Economisch Instituut Monograph 1982, 45p, Figs., Tabs.

ACKNOWLEDGMENT: TRRL (IRRD 271271), Institute for Road Safety Research SWOV  
ORDER FROM: Ministerie van Verkeer en Waterstaat, P.O. Box 20901, The Hague, Netherlands

### 31 380891

#### SERVICE LEVELS OF URBAN PUBLIC TRANSPORT VOLUME VI. EVALUATION OF STANDARDIZATION SYSTEMS AND CALCULATION RESULTS [VOORZIENINGSNIVEAU OPENBAAR STADVERVOER DEEL VI. EVALUATIE NORMERINGSSYSTEMEN EN REKENRESULTATEN]

The two systems selected are described: utilization based systems and cost benefit systems. The cost benefit approach is the theoretical concept regarded in both systems as most appropriate to meet the requirements. The systems differ in the way that future benefits are calculated. In one system (ipa) only the financial side is taken into consideration. In the other system (nei) social benefits are also considered. For the other volumes of this series see IRRD 271267 to 271271, 271273. (TRRL) [Dutch]

See also IRRD 260054, TRIS 361462.

Ministerie van Verkeer en Waterstaat, Nederlandse Economisch Instituut Monograph 1982, 51p, Tabs.

ACKNOWLEDGMENT: TRRL (IRRD 271272), Institute for Road Safety Research SWOV



ORDER FROM: Ministerie van Verkeer en Waterstaat, P.O. Box 20901, The Hague, Netherlands

31 381429

## THE PLANNING AND DESIGN OF A BUS SERVICE IN A RESIDENTIAL AREA

This report describes the planning and design of a bus service for the suburb of Chapel Hill, Brisbane. The area has a high socio-economic status and nearly all of the population live in single family dwelling units. The only bus service is on a congested arterial road on one boundary of the area. A mail-back questionnaire was served to every household to establish work and educational trip patterns for individuals and shopping trip patterns for the household. A new bus service was proposed. Although the questionnaire attracted a response rate of over 50 per cent, indicating an interest in a new service, the predicted ridership would justify only two morning peak period services. Nevertheless, the revenue expected would represent about 93 per cent of the estimated operational cost. The new service is recommended but the effect of not establishing such a service until many years after development should have repercussions in the planning of other urban areas (A).

Pretty, RL (Queensland University, Australia); Abdttly, RLHR (Percon-Putra Site Office, Malaysia); Singh, S *Australian Road Research* Vol. 13 No. 3, Sept. 1983, pp 201-215, 4 Fig., 8 Tab., 10 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 266523), Australian Road Research Board

ORDER FROM: Australian Road Research Board, P.O. Box 156, Bag 4, Nunawading, Victoria 3131, Australia

31 381451

## A NEW APPROACH TO IMPLEMENTING BUS SERVICES- THE LAHORE EXAMPLE

Conventional bus operation in cities of developing countries can provide effective and affordable transport for a wide range of the population. On the other hand, it is frequently found that development constraints severely limit the performance of bus companies. This paper describes recent results of implementing new services requiring over 100 buses in one corridor of Lahore, Pakistan. The planning of new services was based on extensive studies of the demand, road conditions and development potential for bus and other modes. These results were obtained from the first stages of a comprehensive project to improve public transport in Lahore. The project involves designing bus routes, traffic management schemes, new depots and workshops, maintenance and operating systems and related organisations. To implement the improvements it is necessary for the bus company to assimilate many new ideas regarding working practices. Therefore extensive management advice and training is given, especially with regard to maintenance. An important short-term aim was to achieve high daily passenger carrying performance for the new buses-by enabling about 80% of buses to be on road, scheduling buses to operate 250 productive km on routes permitting reasonably high load factors (about 0.5). Six months after implementation of the first new routes this aim was being achieved even though full operations, maintenance and administration systems had not been fully implemented. In other developing countries the shortage of public transport produces a strong pressure on passengers to board overloaded buses. Under these extreme conditions average load factors can be as high as 0.8 and costs can be covered by low fares. In a city such as Lahore, where publicly and privately operated buses compete on the same roads, the supplies from the public and private sectors must be carefully balanced if costs are to be covered by low fares. (a) for the covering abstract of the seminar see IRRD no 272657.

Transport Planning in Developing Countries. Proceedings of Seminar H held at the PTRC 10th Summer Annual Meeting.

Jenkins, I Westberg, C *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* 1982, pp 129-142, 9 Fig., 7 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272668)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

31 381454

## RHINE-RUHR INTEGRATION PAYS OFF

A description is given of the Rhine-Ruhr Transport Association (VRR) set up in 1980 to co-ordinate bus and rail services of the Rhine-Ruhr region

previously run by 19 different undertakings. The extremely complex transport network led to the conclusion that a zonal fare structure was the most realistic solution and this has been developed in the form of 49 area zones and 204 local zones or "honeycombs" in conjunction with 3 basic sorts of tickets- single, four journey and season. The Rhine-Ruhr region being multicentred has very interwoven traffic flows thus making the arrangement of connections difficult. VRR provides a skeleton timetable including priorities on operating hours, frequency, number of seats and connections and the individual operator works out the exact timings. Two basic timetable patterns provide suitable interconnections and flexibility to adjust services with demand. Details are given of the problems in selecting interchanges and of some of the new lines and interchanges planned for the future.

*International Railway Journal & rapid Transit Rev* Vol. 23 No. 8, Aug. 1983, pp 47-48, 1 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 272831)

ORDER FROM: Simmons-Boardman Publishing Corporation, P.O. Box 8, Falmouth, Cornwall, England

31 381455

## THE LONDON RIVERBUS SERVICE

The Greater London Council has invited proposals from interested parties for a river commuter service linking central London at Charing Cross with a number of piers downstream at Greenwich. The craft deployed for the riverbus service will need to operate at a speed of at least 30 knots with a high degree of manoeuvrability for berthing at intermediate piers at all states and strengths of the tide. Suggestions for an extension of the initial, limited operation in central London, both upstream and downstream, are also invited. The author briefly describes the different potential crafts for the proposed service.

Montanaro, J (Thamesway Hydrofoils Limited) *High-Speed Surface Craft* Vol. 22 No. 5, Oct. 1983, pp 12-22, 1 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 272877)

ORDER FROM: Capstan Publishing Company Limited, P.O. Box 9, Tadworth, Surrey, England

31 381469

## SERVING A NEW TOWN. UNITED COUNTIES OPERATION IN MILTON KEYNES

A description is given of the bus services operated in Milton Keynes by the National Bus Company subsidiary United Counties. Milton Keynes is a fast growing new town, approximately 7 miles from end to end with a future population expected to reach 300000. The new town was designed with the idea that all residents would own cars and therefore there would be no need for a bus service. The various new housing estates have an individual network of narrow roads and are joined to each other and the city centre by a grid pattern of larger trunk roads. Bus services are therefore confined to the main roads. No home is more than 400 M away from a bus stop and because the services run on main roads a fairly close headway of 15 min interval can be maintained. Reliability is aided by the good road network and consequent low level of congestion. Experiments with dial-a-ride services penetrating into the housing areas were not a success; most passengers preferred to use the more conventional services. An egalitarian approach to fare levels is operated and a zonal system applies with five fare levels. Off-bus fare collection has been encouraged using a ticket called the quad costing 1.10 pounds and comprising a square card divided into 4. Each portion entitles the holder to one journey of any distance on a citybus service. The tickets are available through retail outlets, post offices and libraries. Despite its car-oriented origins Milton Keynes has emerged as one of the bright spots of NBC stage operation. (TRRL)

*Buses* Vol. 35 No. 341, Aug. 1983, pp 348-349, 3 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 272588)

ORDER FROM: Allan (Ian) Limited, Terminal House, Shepperton TW17 8AS, Middlesex, England

31 381470

## JANE'S URBAN TRANSPORT SYSTEMS 1983. SECOND EDITION

The book is organised into sections covering the main hardware for road and rail urban transport systems and their ancillary services. The sections

are as follows: Financing city transport, Innovative transport systems 10 years on, Manufacturers (rail vehicles and propulsion equipment, rail components and sub-assemblies, road vehicle chassis and integral vehicles, road vehicle bodybuilders, road vehicle chassis units, road vehicle body fittings, signalling, communications and traffic control equipment, revenue collection equipment, track components and maintenance equipment, vehicle maintenance equipment), Consultancy and contracting services, Rail transit systems, Bus and trolleybus systems. The systems operated by the world's major cities are listed. Within the systems sections of the book for each city the characteristics of each modal operation have been described and so for some cities there are several mentions where the task of providing public transport is not entrusted to a single undertaking and where there are a variety of modes in use. In other cities, usually where private transport is in private hands, the multiplicity of operators is such that details of the overall public transport has been listed under generic terms like "bus" or "minibus". A brief description of the organisation and administration of public transport for the cities included will be found in the road transport section. (TRRL)

Bushell, C Stonham, P  
Jane's Publishing Company Limited BOOK 1983, 377p, Figs., Tabs.,  
Phots.

ACKNOWLEDGMENT: TRRL (IRRD 272634)  
ORDER FROM: Jane's Publishing Company Limited, 238 City Road,  
London, England

**31 381486**  
**REDESIGNING LOCAL TRANSPORTATION SERVICE IN**  
**SMALL AND MEDIUM SIZE COMMUNITIES**

Conventional strategies—labor productivity improvements, service cut-backs, fare increases and marketing—afford a certain measure of relief, but do not offer a lasting solution to the problem of eroding ridership and escalating deficits. If communities are to restore their transit systems to a truly sound footing, they must consider more fundamental changes in transit organization, provision and financing—such changes are called in this article "service redesign". The article explains the concept and illustrates it with two examples, the programs of the Tidewater Transit District Commission and the Peninsula Transportation District Commission, in Southeastern Virginia.

Orski, CK (Corporation for Urban Mobility) *Transitions* 1983, pp 1-8

ORDER FROM: ATE Management and Service Company,  
Incorporated, Editor, 617 Vine Street, Suite 800, Cincinnati, Ohio,  
45202

**31 381495**  
**RAMPS IN STATIONS OF THE SWISS FEDERAL RAILWAYS**

Development of pedestrian ramps in stations of the Swiss Federal Railways (SBB) began in 1957 with the construction of the new rail terminal in Bern. Since then all new and reconstructed transportation facilities in Switzerland have been made accessible by ramps as a matter of policy. The paper summarizes the benefits derived from access of trackside platforms via ramps for handicapped and elderly persons as well as for other travelers. The paper cites guidelines, design standards and regulations governing the construction of ramps in Switzerland and describes the types of ramps currently in use within SBB. Building ramps is seen as a means for saving on operating costs and making the railway more attractive to the public.

Kirsch, KD (German Federal Railway) *Specialized Transportation Planning and Practice* Vol. 1 No. 4, 1983, pp 361-370, 3 Fig., 5 Ref.

ORDER FROM: Gordon and Breach Science Publishers Limited, 42  
William IV Street, London WC2N 4DE, England

**31 381502**  
**TRANSIT AGENCY USE OF PRIVATE-SECTOR STRATEGIES**  
**FOR COMMUTER TRANSPORTATION**

Demand for public transit services in most urban areas is concentrated in the peak period. However, peak-period service is significantly more expensive to the transit agency than its other services and usually produces larger deficits. Faced with pressures to maintain or increase commuter services, yet also control rapidly escalating deficits, transit agencies are in need of strategies that improve the cost-effectiveness of commuter transportation. Several innovative service strategies, which make use of the private sector (service contracting, service turnovers, vanpooling), have

considerable potential to achieve this objective and are alternatives to traditional transit agency approaches to problem solving. Transit agency use of innovative private-sector strategies is examined based on a study of eight transit agencies in eight diverse metropolitan areas, all with some significant private-sector activity in commuter transportation. The reasons these agencies have or have not adopted these strategies are identified, and the major barriers to their more widespread use are specified. The initial incentive to consider nontraditional approaches comes from fiscal and service pressures that require some change in the status quo, but whether private-sector strategies are actually used depend largely on four factors: (a) management interest in nontraditional approaches, (b) analyses that demonstrate the utility of innovative approaches, (c) discretionary rather than dedicated local subsidies, and (d) the ability of local government officials to influence the transit agency's service and budget decisions. The main barriers to innovation are traditional management orientation, labor constraints posed by federal legislation or local union contracts, and subsidy and decision-making arrangements that give the agency no strong incentive to improve the cost-effectiveness of its different types of services.

This paper appeared in *Transportation Research Record* No. 914, *Transportation Innovations: Ridesharing Techniques and Public-Private Cooperation*.

Teal, RF Giuliano, G Brenner, ME (California University, Irvine)  
*Transportation Research Record* No. 914, 1983, pp 34-41, 2 Tab., 5  
Ref.

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**31 381505**  
**URBAN BUS TRANSPORT IN BUENOS AIRES: THE**  
**COLECTIVOS**

The urban bus system in Buenos Aires, which carries more than 50 percent of all trips and is provided by profitable medium-sized companies, is discussed. The developments of urban transport in the city, and the nature and organization of the component companies that have evolved there, are reviewed. Particular attention is drawn to the combination of medium-sized buses and high frequencies that is characteristic of Buenos Aires, and information is given about one particular company. It is concluded that the Buenos Aires experience has relevance for urban bus operation in Europe and North America. Conventional wisdom, which assumes that large business units and large vehicles are the optimum solution to the problems of urban transport, is questioned.

This paper appeared in *Transportation Research Record* No. 914, *Transportation Innovations: Ridesharing Techniques and Public-Private Cooperation*.

Hibbs, J (City of Birmingham Polytechnic, England) *Transportation Research Record* No. 914, 1983, pp 57-60, 4 Ref.

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**31 381527**  
**URBAN PUBLIC TRANSPORT IN MEXICO CITY [SISTEMA**  
**DE TRANSPORTE COLECTIVO EN LA CIUDAD DE MEXICO]**

In this article the author describes the development of the Mexico city metro system over the last few years and the technical improvements that are to be made in the near future, i.e. a new electricity supply system, automatic train running and control, etc. The last part of the article gives an account of the civil engineering techniques used in building the metro infrastructure. [Spanish]

Diaz, J *AIT-Revista* No. 52, June 1983, pp 32-44, 3 Fig., 3 Tab., 13  
Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Asociacion de Investigacion del Transporte, Alberto  
Alcocer 38, Madrid, Spain

**31 381536**  
**MEDIUM-TERM DEVELOPMENT OF S-BAHN NETWORKS**  
**[DER AUSBAU DER S-BAHN-SYSTEME AUS**  
**MITTELFRISTIGER SICHT]**

Over the last fifteen years, the DB has made a strong contribution to the improvement of transport in densely populated areas in Germany by upgrading existing lines as part of Regional Express Network (S-Bahn) development projects. The investment objectives already reached prove that the S-Bahn is a viable alternative to private transport and that the transport

offered in large areas is not conceivable without this basic ingredient. [German]

Werler, R *Eisenbahntechnische Rundschau* Vol. 32 No. 7-8, 1983, pp 463-473, 16 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

**31 381537**  
**SHORT DISTANCE PASSENGER PUBLIC TRANSPORT FOR SURFACE TRAFFIC [BEDIENUNG DES OEFFENTLICHEN PERSONNENNAHVERKEHRS IN DER FLAECHE]**

Short distance passenger public transport for surface traffic is presently strongly criticized on political as well as technical grounds. The author examines whether the DB's offer matches demand in this field. He suggests the measures that should be taken to adapt surface public transport to demand, improve it and make it more economical. [German]

Stertkamp, W *Eisenbahntechnische Rundschau* Vol. 32 No. 7-8, 1983

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

**31 381540**  
**RAILWAYS: MASS TRANSIT**

Urban mass transit systems are a major growth area for the railway industry, posing quite different challenges from high-speed inter-city transport networks.

*Engineering* Vol. 223 No. 8, Aug. 1983, 3p, 1 Fig., 8 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
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**31 381560**  
**SOME ASPECTS OF RAILWAY FINANCE**

First, a review is presented of likely developments in market conditions for rail services in the next 20 years, focussing mainly on the passenger market. It is argued that external conditions would cause some continued downward pressure on the market, but less so than in previous years. The pressure is not such as to constitute an inevitable decline, and experience elsewhere shows that market expansion is possible, though expensive. Consideration is given of the significance to British Rail of developments in general trends, long-distance coach traffic, London, car use (especially "second" and company cars), cross channel movement and other factors. Secondly, it is argued that some degree of Government support will continue to be available for BR, and that therefore a formal management objective designed to assess "value for money" is desirable. The British Railways Board's proposal for a system called "Weighted Passenger Miles Within a Financial Constraint" is discussed, and supported. Thirdly, there is a brief comment on privatisation.

Goodwin, PB  
Oxford University, England TSU/REF-188/CP, June 1982, 18p

ORDER FROM: Oxford University, England, Transport Studies Unit, 11 Bevington Road, 11 Bevington Road

**31 381589**  
**DEVELOPMENT AND APPLICATION OF ANALYSIS MODEL FOR RAILROAD TRAFFIC DEMAND ATTENDANT ON LOCAL IMPROVEMENT OF RAILWAY TRANSPORT**

Distribution of traffic load between rail and road is an important problem even in areas other than urban zones. A fairly elaborate model to analyze the effects of local improvements of railway (increased frequency and speed of trains) on traffic flow in a network comprising the improved line and adjacent roads, as well as the inducement and allocation of passengers, has been developed. Using this model, a possible effect of track addition of the Oou Line between Hirosaki and Aomori in Japan is estimated.

Miyata, H Soda, K *Railway Technical Research Inst, Quarterly Reports* Vol. 24 No. 1, Mar. 1983, pp 15-18

ACKNOWLEDGMENT: EI  
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**31 382236**  
**GEORGE WASHINGTON BRIDGE BUS STATION ACCESS AND SERVICE STUDY**

Recent attention has focused on the declining use of the George Washington Bridge Bus Station and the search for possible methods, in particular Transportation Systems Management (TSM) techniques, which might stem the losses or reverse the decline. The objectives of this project are to study and develop recommendations that would improve this facility's attractiveness to users and its service to the community. The study examines access, patron services, communications, user and potential user attitudes, and other areas, in order to determine whether existing patrons can be better served and new ones attracted. Using this information the report goes on to identify existing problem areas, evaluate alternative TSM solutions to these problem areas and make recommendations.

Port Authority of New York and New Jersey, Tri-State Regional Planning Commission, Urban Mass Transportation Administration Final Rpt. IT-09-0089, TS A611, Nov. 1982, 225p, 5 Fig., Tabs., 9 App.

ORDER FROM: Port Authority of New York and New Jersey, One World Trade Center, Room 72W, New York, New York, 10048

**31 382239**  
**BRIDGEPORT TRANSPORTATION CENTER STUDY**

The Bridgeport Transportation Center, located adjacent to the Central Business District, is comprised of several public transport entities: rail station (Amtrak and Metro-North Commuter Railroad); bus terminal (Greater Bridgeport Transit District and intercity carriers); ferry terminal (The Bridgeport and Port Jefferson Steamboat Company); 488-space parking garage; as well as taxi, elderly/handicapped transportation and private bus shuttles. The Center serves as the regional focus for public transport services; however, problems exist: an intermodal orientation is lacking, coordination of operations or schedules is minimal, information is fragmented and incomplete, and, physical connections are not defined. The report details 36 operational, physical and maintenance improvements. Costing and implementation are presented according to a prioritized schedule. Funding opportunities are indentified at the federal, state and local levels.

Greater Bridgeport Regional Planning Agency 6.21-05(83), Oct. 1983, 350p, Figs., Tabs., 3 App. Contract UMTA-CT-09-0040

ORDER FROM: Greater Bridgeport Regional Planning Agency, 525 Water Street, Room 305, Bridgeport, Connecticut, 06604

**31 382241**  
**ANALYSIS OF PUBLIC TRANSPORTATION ALTERNATIVES BETWEEN MANHATTAN AND KENNEDY AIRPORT THROUGH THE QUEENS TRAVEL CORRIDOR. PHASE II—FINAL TECHNICAL REPORT**

New York City's Kennedy Airport, expected to handle 35 million passengers by 1995 (a one-third increase from 1981), is seen encountering landside traffic constraints unless there is improved access by public transportation. Any improvement will also facilitate movement of employees working at the Airport and can improve travel for Queens residents in the Midtown Manhattan-to-JFK corridor. Transportation system management (TSM) as applied to the problems would involve low-cost operational improvement to the two primary JFK public transportation access systems—express buses from Midtown and express rapid-transit service. More capital intensive improvements would involve changes in the rapid-transit/feeder-bus terminal near JFK, a restricted access road into the airport for buses and other high-occupancy vehicles, and a 5.4-mile busway on an inactive railroad right-of-way. Tables for the various options summarize passengers benefitted, capital required per passenger, revenues, operating and maintenance costs, and operating savings per benefitted passenger.

Accompanying documents include Findings and Recommendations; Report to Principals; and Working Papers 1 through 10 and 101 through 113.

Port Authority of New York and New Jersey, Urban Mass Transportation Administration Final Rpt. UMTA-NY-0084, July 1983, v.p., Figs., Tabs.

ORDER FROM: UMTA

31 382249

**ADDITIONAL EXTENSION OF THE FRANKFURT RAPID TRANSIT SYSTEM IN OPERATION [ERWEITERTE BAUSTUFE DER FRANKFURTER S-BAHN IN BETRIEB]**

The rapid transit system of Frankfurt on the Main (West Germany) has been extended after a four-year long construction period. Although the length of the new addition is relatively low (only about 1.2 km), it now features several significant improvements. This new sector is supplied with 15 kv power at 16 2/3 Hz. Electric and mechanical equipment is described. [German]

Niekamp, K (Bundesbahndirektion, Frankfurt am Main, W Germany) *Elektrische Bahnen* Vol. 81 No. 5, May 1983, pp 180-181

ACKNOWLEDGMENT: EI  
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31 382250

**50 YEARS ELECTRIC TRACTION ON THE RAILROAD LINE AUGSBURG-STUTTGART AND 50 YEARS ELECTRIC OUTER SUBURBAN TRAFFIC IN THE GREATER STUTTGART AREA [50 JAHRE ELEKTRISCHER ZUGBETRIEB AUF DER STRECKE AUGSBURG-STUTTGART UND 50 JAHRE ELEKTRISCHER NAHVERKEHR IM GROSSRAUM STUTTGART]**

A brief historical sketch is presented of developments taking place in the 1930's towards the electrification of the Bavarian railroad system linking it to Stuttgart, presently in West Germany. The rapid transit system in the metropolitan area of Stuttgart is also described. [German]

Klein, W (German Federal Railway) *Elektrische Bahnen* Vol. 81 No. 6, June 1983, pp 209-210, 7 Ref.

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

31 382265

**ANALYSIS OF A RADIAL BUS SYSTEM FOR CBD COMMUTERS USING AUTO ACCESS MODES**

A radial bus system to service peak period demand for "drive and ride" travel between the CBD and residential areas is analyzed for a general demand density that varies in space and time. Attributes for the system such as the cost of gaining access to the lines, the waiting time for a bus and the operating cost are discussed. A simple formula for the number of lines from a region is proposed.

Wirashighe, SC (Calgary University, Canada); Ho, HH *Journal of Advanced Transportation* Vol. 16 No. 2, 1982, pp 189-208, 14 Ref.

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

31 382284

**THE AGE OF THE LIGHT RAIL TRAIN**

The planned London dockland railway will provide the successful tenderer with an international showcase.

Wyman, V *Engineer* Vol. 257 No. 6648/9, 1983, pp 16-17, 1 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
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31 382289

**DESIGN AND CONSTRUCTION OF THE HARBURG S-BAHN [PLANUNG UND BAU DER HARBURGER S-BAHN]**

The first 13 km section was opened on 23 September 1983 between the main station in Hamburg and the Harburg town hall. The new regional express network project is one of the largest of its kind in the Federal Republic of Germany. [German]

Seewig, K *Die Bundesbahn* Vol. 59 No. 9, 1983, pp 579-596, 34 Phot., 16 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

31 382290

**THE HARBURG S-BAHN—IMPROVEMENTS OF TRAIN SERVICES SOUTH OF THE ELBE [S-BAHN NACH HARBURG—VERBESSERUNG DER VERKEHRSBEDIENUNG IM SUEDERELBERAUM]**

The opening of the Harburg S-Bahn (HSB) in September 1983 changed the whole pattern of train services in the part of Hamburg lying south of the Elbe. The new direct current S-Bahn serves as the main link while buses provide a connecting service at terminals. The HSB trains run at regular intervals on their own line, penetrating into the centre of Harburg via two underground stations. To the north of the Elbe the line joins up with the existing direct current network. The Hamburg Transport Company which has conducted a vigorous marketing campaign in connection with the new network is hoping to attract a whole range of new customers with the HSB service. [German]

Grabe, W Westphal, PJ *Die Bundesbahn* Vol. 59 No. 9, 1983, pp 557-562, 6 Phot., 11 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

31 382291

**THE RHINE-RUHR REGIONAL EXPRESS NETWORK [S-BAHN RHEIN-RUHR]**

The Federal State of North Rhine—Westphalia is setting up a 320 km long independent regional express network (S-Bahn). The network covers the area between the frontier with the Netherlands in the west and Unna and Hagen in the east, and between Haltern in the north and Grevenbroich and Langenfeld in the south. Construction work is at present concentrated on the area east of the Ruhr, between Bochum and Dortmund. The author describes the work in progress on this part of the network. [German]

See also Volume 31 No. 3 pp 103-107 of *Nahverkehrspraxis*.

Grosche, W *Nahverkehrspraxis* Vol. 31 No. 2, 1983, pp 46-51, 19 Phot., 15 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Arnold Verlag, Siegburg Strasse 5, 4600 Dortmund, West Germany

31 382297

**AN INTEGRATED MASS TRANSPORTATION SYSTEM FOR KUMASI, GHANA**

Mass transit in the second largest city in Ghana is provided by the private sector (taxi and jitneys) and the public sector (buses and commuter trains). The private sector is characterized by many one or two vehicle operators; The Omnibus Services Authority operates the buses and the Ghana Railway Corp. operates the trains. A major problem is that the large number of operators prefer to operate only routes with high ridership potential. It is proposed that the modes be integrated, with terminals established to serve as transfer points. A ring-road service is proposed to connect the outer ends of the radial trunk-haul routes. A management agency is proposed to optimize the use of available resources.

Akom, AA *Transportation Quarterly* Vol. 38 No. 1, Jan. 1984, pp 59-68

ORDER FROM: Eno Foundation for Transportation, Incorporated, P.O. Box 55, Saugatuck Station, Westport, Connecticut, 06880

31 382308

**ANALYSIS OF REGIONAL PARK-AND-RIDE AND EXPRESS BUS SERVICE**

The results of a study aimed at increasing the transit patronage, reducing the automobile travel, and improving the air quality in the Delaware Valley Region by introducing park-and-ride and express bus service are summarized. For this study, 45 bus corridors connecting 178 parking locations in major shopping areas with 500 or more parking spaces were initially identified. Many of these corridors were eliminated from further consideration to avoid duplication of service and frequent bus stops along the routes. A set of 21 corridors linking 47 parking locations was then tested by using UMTA's UTPS modeling package. Those park-and-ride locations that attracted more than 250 riders from the existing commuter and subway-elevated routes in the vicinity of the parking locations were not included. Other locations that attracted fewer than 50 riders from the use

of automobiles were also dropped from further consideration. Based on these criteria, a final network of 14 routes and 25 parking lots is recommended for further detailed analysis and implementation studies. The impact on air quality and energy of the recommended facilities is also presented. Estimates for capital expenditure and operating cost for implementing the park-and-ride and express bus service are also included.

This paper appeared in Transportation Research Record No. 915, Urban Buses: Planning and Operations.

Zakaria, T Latif, CA Salpeas, PP (Delaware Valley Regional Planning Commission) *Transportation Research Record* No. 915, 1983, pp 31-39, 5 Fig., 6 Tab., 9 Ref.

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**31 382566**

**THE EMERGENCE OF HIGH-SPEED RAIL**

Proposals to apply Japanese, French and other non-U.S. technology to high-speed intercity service in the U.S. are described. Projects in California (Los Angeles-San Diego), south Florida (Miami-Orlando-Tampa), and Texas (Houston-Dallas) are being developed with California's the most advanced. This Los Angeles-San Diego line would utilize Japan's Shinkansen technology and with several intermediate stations would offer relatively short-haul service. Engineering for this line is described. It is concluded that future prospects for high-speed trains in the U.S. depend primarily on the success of the first line to be built.

*Mechanical Engineering* Vol. 106 No. 1, Jan. 1984, p20-25, 1 Fig., 1 Phot.

ORDER FROM: ESL

**31 382595**

**AN ORIGINAL EXPERIMENT: THE ABIDJAN WATER BUSES**

The capital of Africa's Ivory Coast, one of the world's fastest growing cities, has developed around a series of lagoons fed by rivers from the interior. The public transit agency of the city operates over 1,100 buses and 19 boats. Bus and ferry services have been integrated with the water buses carrying about 800,000 passengers per month late in 1982. Characteristics of boat riders, fares, operating costs, and operating practices are described. The boats have speeded east-west movements across the city, avoided major bridge building, reduced crowding of buses, and affected land use in both residential and business areas. Some ways of meeting future water traffic growth are described.

Pascal, JY (Societe des Transport Abidjanais) *UITP Revue* Vol. 32 No. 4, 1983, pp 333-338, 7 Tab.

ORDER FROM: International Union of Public Transport, Avenue de l'Uruguay 19, B-1050 Brussels, Belgium

**31 382623**

**GUIDELINES FOR THE DESIGN OF TRANSIT RELATED ROADWAY IMPROVEMENTS**

The purpose of this report is to provide a uniform guide to the development and design of various transit related roadway improvements. It is a technical document which reflects the current transit related factors which traffic engineers, architects, planners, and developers should consider during the design process for streets and highways, as well as residential, commercial, and industrial developments. The report covers several topic areas which include: design vehicle operating characteristics; roadway facilities; traffic control devices; park and ride lots; passenger shelters; bus stop design; handicapped transportation; and ridesharing considerations. Much of the information is also useful for school buses and other larger vehicles. In addition, the report identifies, by subject matter, the appropriate transit contact person to answer various transit related questions. This report also references related design manuals and standards developed by the Minnesota Department of Transportation, American Association of State Highway and Transportation Officials, and the Institute of Transportation Engineers. The authors note that the information contained in this report should not be used by the designer as standard details on which to base a final design, but rather as recommended criteria that are valuable in attaining good designs and which should be considered when designing transit facilities.

Jessup, DR Van Wormer, G Preston, H

Metropolitan Transit Commission, Urban Mass Transportation Administration UMTA-MN-09-0042-83-1, May 1983, 126p Contract MN-09-0042

ORDER FROM: NTIS PB84-124148

**31 382684**

**THE JAKARTA TRAFFIC MANAGEMENT STUDY. 3. IMPACT OF HIGH "PARA-TRANSIT" FLOWS**

This article is concerned with the work undertaken to assess the relative impact of varying levels of paratransit flow on traffic flow along a variety of different road types in Jakarta. Assessments have been made concerning the utilisation of road space per passenger and the effect of varying paratransit levels on speed/flow relationships. Such effects have then been translated into economic terms in an effort to demonstrate the probable economic impact of changes in current vehicle licensing regulations. Recommendations are made for a four-tier hierarchy of public transport operations ranging from double deck buses operating in bus only lanes along the heaviest demand corridors; to regular city buses operating on most other two-lane dual carriageways and the wider two-way roads; to mini-buses operating on the narrower two-lane roads of traffic importance; and to mikro-buses providing feeder services into and out of the residential areas adjacent to such major routes. It is felt that there is a need for a re-evaluation of the relative overall efficiency of the various service types encountered in the major cities of the developing world, which takes into account the mix of vehicle types most appropriate to the different categories of road and the total costs involved. For abstracts of parts 1 and 2 see TRIS 381175 and 381176. (Author/TRRL)

Mogridge, M (Colin Buchanan and Partners) *Traffic Engineering and Control* Vol. 24 No. 9, Sept. 1983, pp 441-448, 1 Fig., 4 Tab., 3 Phot., 6 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273543)

ORDER FROM: ESL

**31 382750**

**IMPACT OF HIGH "PARA-TRANSIT" FLOWS ON ROAD CAPACITY**

Based on recent experience from the Jakarta traffic management study the author examines the problems posed by the heavy use of small para-transit vehicles in a different way. Rather than repeat the much voiced arguments put by the free market economists concerning the benefits resulting from the use of a non-subsidised public transport mode, the author draws attention to the differing performance of small and large public transport vehicles in terms of utilisation of road space per passenger, and identifies the likely costs to other road users brought about by the proliferation of the smallest para-transit vehicles. The paper goes on to identify the heavy impact of high volumes of smaller public transport vehicles on road capacity and hence on the public transport problem in particular. Reference is made to a wide range of survey results which include routes carrying peak flows of up to 500-600 para-transit vehicles per hour. Conclusions are drawn concerning a more appropriate public transport service hierarchy by vehicle type for use in such cities as Jakarta. (Author/TRRL)

Developing Countries. Proceedings of Seminar G held at the PTRC Summer Annual Meeting, University of Warwick, England, 4-7 July 1983.

Mogridge, MC (Colin Buchanan and Partners) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P237*, 1983, pp 163-176, 4 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 273957)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**31 382772**

**THE EFFECT OF DEREGULATION ON NATIONAL EXPRESS**

The presentation examines the various stages of change in the express bus and coach market as a result of deregulation, and describes the steps taken by NBC to develop a viable product, in a competitive environment through effective marketing and restructuring of the NBC organisation. After examining the strengths of its organisation on which to build NBC responded to the Transport Act by developing attitudes appropriate for competition. Price cutting of fares between BR inter-city. British Coachways and NBC confirmed NBC in its decision to eliminate cross-subsidy in national express. An established nationwide network of services and agents,

a larger marketing budget than its coach competitors plus Victoria coach station for London interchange gave National Express considerable strength. Development of services, including new cross country links have facilitated joint promotions with ferries, other express operators-especially the quality "rapide" services-and holiday operators. Joint promotions with parcels operations and advertising campaigns with manufacturers have developed as also has public awareness of national express especially through new prestel and telephone facilities. NBC determined that local limited stop, weekend seaside and commuter service, served a different market requiring complementary development. In 1982 a reorganisational strategy divided the country into 9 areas to co-ordinate the local companies who provide the services with the national express division. A common livery was chosen to keep the express identity. Finally, the future of national express and the possibilities of further growth are considered and the financial details are presented showing an upward trend in passengers, revenue and profit from NBC express services since the ACT was introduced. (Author/TRRL)

Public Transport Planning and Operation. Proceedings of Seminar L held at the PTRC 11th Summer Annual Meeting.

Brks, JA (National Bus Company) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1983, pp 133-143, 2 Fig.**

ACKNOWLEDGMENT: TRRL (IRRD 273505)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**31 382782  
PUBLIC TRANSPORT CO-ORDINATION: THE EAST SUSSEX APPROACH**

Up to now East Sussex has pursued the conventional approach to co-ordinating all forms of public transport. Two experiments are currently underway in this country to develop new forms of public transport, which, if successful, could have wide implications for other authorities. The first experiment, in a rural area, aims to integrate the conventional stage carriage services with the transport facilities provided by the area health authority, the social services department, the education department and voluntary bodies. A "brokerage" system will control the total Tertiary transport system and co-ordinate the needs of all users. The second is an urban experiment aimed at people travelling to and from the main central areas. A direct shuttle service is being set up to operate a fast frequent service, with attractive fares on an easy to use "no timetable" basis. Journey times will be reduced by up to 20% by omitting intermediate stops, selected traffic management measures and streamlined fare collection methods. This paper will outline the current situation in East Sussex, the development of a balanced overall transportation strategy, and introduces the two experiments. (Author/TRRL)

Public Transport Planning and Operation. Proceedings of Seminar L held at the PTRC 11th Summer Annual Meeting.

Charnock, DB (East Sussex County Council) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1983, pp 1-3**

ACKNOWLEDGMENT: TRRL (IRRD 273493)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**31 382783  
THE BRIGHTON SHUTTLE EXPERIMENT**

This paper deals with the urban experiment outlined in MR Charnock's paper (see IRRD 273493). The paper will examine the existing public transport situation in the Brighton area, suggesting where, when and how existing public transport services can be changed to halt the decline in passengers. Development and marketing of the shuttle service will be discussed, together with initial reactions following the introduction of the new services. It will be possible for delegates to see the shuttle in operation in the Brighton area. (Author/TRRL)

Public Transport Planning and Operation. Proceedings of Seminar L held at the PTRC 11th Summer Annual Meeting.

Robbins, J (East Sussex County Council) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1983, pp 15-19**

ACKNOWLEDGMENT: TRRL (IRRD 273494)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**31 382801  
HOW FAR CAN COMMUTER COACHING GROW?**

The effects of the Transport Act 1980 on commuter coach travel to London are considered. It is shown that before the Act substantial potential for commuter coaching existed. The two main drawbacks for such services are due to traffic congestion and hence journey time in comparison to rail and the classic "peak problem" whereby vehicles and drivers are in use for a limited period of each day. A number of independent operators services have not continued due to these problems, though greater success has been enjoyed by NBC companies such as Alder Valley, Green Line and Maidstone & District. For example Alder Valley's routes from Reading, Aldershot, Bracknell etc were revamped as "Londonlink", making greater use of the M3 and M4. Commuter traffic grew rapidly and also off-peak demand. Alder Valley carried 1.25 million passenger trips within the first 18 months. Mention is also made of successful operation by Reading and Southend boroughs who after early problems with a joint Reading-London-Southend service have both flourished running separate London services. Heavy growth has occurred also in North Kent where there is less competition from rail. The better access offered by the coach, both at the home end- running direct from major housing estates-and in central London (often removing the need for a further ride by tube) has offset some of the extra journey time due to lower average speeds. Commuter clubs have grown mainly on the corridor north west of London. A table is presented showing total commuter coach flows based on surveys carried out by polytechnic staff in may-june 1983. It is concluded that there is scope for further growth in commuter coaching and mention is made of a possible further stimulus to growth that could be given by use of reserved track ie busways, as used in Runcorn, or peak period reserved lanes on motorways and main roads. (TRRL)

White, PR (Polytechnic of Central London) **Coaching Journal and Bus Review Vol. 52 No. 2, Dec. 1983, pp 18-20, 1 Tab., 5 Phot.**

ACKNOWLEDGMENT: TRRL (IRRD 273633)  
ORDER FROM: Travel and Transport Limited, 122 Newgate Street, London EC1A 7AD, England

**31 382804  
THE EDP ANALYSIS OF LINE SYSTEM ALTERNATIVES OF THE ESPOO MASS TRANSIT SYSTEM [ESPOON JOUKKOLIHKENTTEEN LINJASTOVAIHTOEHTOJEN ATK-ANALYYSI]**

The Espoo public transport system consists of over 100 bus lines and short distance rail services along the Finnish coast. Details are given of the system and of the linear computer program developed for the planning and analysis of the system. (TRRL) [Finnish]

Granberg, T **Tie ja Liikenne No. 9, 1983, pp 357-359, 3 Phot.**

ACKNOWLEDGMENT: TRRL (IRRD 273938)  
ORDER FROM: Finnish Road Association, Vironkatu 6, 00170 Helsinki 17, Finland

**31 382807  
TRAM LINE**

Brief details are given of the proposed London docklands light rail scheme, completion of which is due in 1987. It will use one of London's oldest railways which has been derelict since the Second World War. Trains will run from a new station at Tower Hill next to the Tower of London, down through docklands to the bottom end of the Isle of Dogs, opposite Greenwich hospital. A branch will run to Stratford Broadway. The whole scheme can be built for L77 million. (TRRL)

**New Society Vol. 67 No. 1104, Jan. 1984, pp 80-81**

ACKNOWLEDGMENT: TRRL (IRRD 273718)  
ORDER FROM: IPC Magazines Limited, King's Reach Tower, Stamford Street, London SE1 9LS, England

**31 382814  
A RAIL STRATEGY FOR GREATER MANCHESTER. FIRST REPORT OF THE RAIL STUDY GROUP**

The report summarises the results of a joint study to develop a long-term strategy for the maintenance and development of a local rail network to serve the county. The study has been specifically concerned with the problems of re-equipping the lines which do not carry British Rail services, and also of achieving adequate access into and across the regional centre,

whilst also providing adequate interchange with Manchester inter-city services. Work carried out so far has established the general technical feasibility and order of capital costs of the main alternatives considered. Further work needs to be carried out to determine the operating and financial implications of the various strategies, including possible modifications to existing bus service networks. It is concluded that in terms of capital costs, and feasibility of phasing, an "on-street" surface level light rapid transit system is an attractive proposition and should be discussed by interested organisations when considering the main options put forward. (TRRL)

Greater Manchester Council, British Railways Board Monograph Feb. 1983, 8p, 8 Fig., 2 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 273309)  
ORDER FROM: Greater Manchester Council, Chief Executives Office, Manchester, England

**31 382867**  
**BICYCLE OWNERSHIP USE AND EXPOSURE: PARTICIPATION AND ACTIVITY ANALYSES OF TRANSPORT STUDIES DATA**

Systematic analyses of bicycle specific issues as an intrinsic part of overall transport planning are still very unusual (except in the Netherlands and West Germany). The work described in this report is a development of a previous report by the author: "Bicycle Ownership, Use and Exposure in Melbourne, 1978-9". Results are presented on various aspects of cycling under the following headings: patterns of household ownership and personal access to bicycles, levels of participation in cycling, the exposure of cyclists on the road, some intermodal and interstate comparisons, amount of travel by cyclists, in terms of trips made by cyclists and by households containing cyclists, time spent on activities such as shopping, work, etc, by cyclists and cycling households. (TRRL)

Transport Planning Methods. Proceedings of Seminar N held at the PTRC Summer Annual Meeting, University of Sussex, England, 4-7 July 1983.

Wigan, MR (Australian Road Research Board) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P243, 1983, pp 311-344, 16 Fig., 11 Tab., 14 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 273159)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**31 382889**  
**A MODEL FOR MEASURING THE LEVEL OF QUALITY OF PUBLIC BUS TRANSPORT [METHODIEK TER BEPALING VAN HET KWALITEITSNIVEAU VAN HET OPENBAAR BUSVERVOER]**

The model, described in this paper is aimed at determining simply, at the design stage, the influence of town-planning and traffic-planning design on the quality level of a bus service. For that purpose in the first instance six levels of quality are defined. Three of these levels are related to separated bus roads and three to buses among other traffic (cf "levels of service" hcm). A scale is developed to determine the influence of design factors such as curvature, distance between stops, on the quality level. In this way it is easy to examine how the service speed is influenced, when the requisite design criteria are not reached. The methodology is illustrated with examples from practice. (Author/TRRL) [Dutch]

Conference Papers of the Working Days on Traffic Engineering 1983.

Kwakernaak, M Eddes, W (Dhv Raadgevend Ingenieursbureau) **Bijdragen Verkeerskundige Werkdagen 1983 Apr. 1983, pp 275-290**

ACKNOWLEDGMENT: TRRL (IRRD 272701), Institute for Road Safety Research SWOV  
ORDER FROM: Werkdagcommissie, P.O. Box 163, Driebergen-rijnsbur, Netherlands

**31 382891**  
**FASTER TOWARDS A FAST PUBLIC TRANSPORT. THE PROJECT APPROACH FOR LIGHT-RAIL-LINE NUMBER 12 [HET PROJECT LIJNSGEWIJZE AANPAK TRAMLIJN 12. SNELLER NAAR EEN OPENBAAR VERVOER]**

As a result of the municipal note "Traffic Control", early 1982 in Amsterdam a planning group "Line-Wise Approach" was set up. This

planning group had the task of improving the through-put of Tramline 12 by means of simple measures concerning traffic lights. This paper gives an account of the working method, the covering research and the results. The evaluation shows that it is possible by the use of simple measures and with low costs, to reduce the total driving time and improve the level of service. (Author/TRRL) [Dutch]

Conference Papers of the Working Days on Traffic Engineering 1983.

Bruggemans, G (Gemeentevervoerbedrijf Amsterdam) **Bijdragen Verkeerskundige Werkdagen 1983 Apr. 1983, pp 299-314, 3 Tab.**

ACKNOWLEDGMENT: TRRL (IRRD 272703), Institute for Road Safety Research SWOV  
ORDER FROM: Werkdagcommissie, P.O. Box 163, Driebergen-rijnsbur, Netherlands

**31 382892**  
**CHANGES IN THE REGULATION OF TRAFFIC LIGHTS TO IMPROVE THROUGH-PUT. THE PROJECT APPROACH FOR LIGHT-RAIL LINE NUMBER 12 [HET PROJECT LIJNSGEWIJZE AANPAK TRAMLIJN 12]**

Early 1982 in Amsterdam a group of people was confronted with the task of improving the through-put of Tramline 12 by means of simple measures concerning traffic lights. This paper describes: (a) the possible changes in traffic control; (b) the measures taken for the traffic control of six major intersections. The evaluation of these measures points out that there is a possibility of reducing delays due to waiting for traffic lights by the use of simple methods. (Author/TRRL) [Dutch]

Conference Papers of the Working Days on Traffic Engineering 1983.

Mak, W (Gemeente Amsterdam) **Bijdragen Verkeerskundige Werkdagen 1983 Apr. 1983, pp 315-326, 5 Fig., 3 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 272704), Institute for Road Safety Research SWOV  
ORDER FROM: Werkdagcommissie, P.O. Box 163, Driebergen-rijnsbur, Netherlands

**31 384574**  
**PUBLIC TRANSIT: AT THE CROSSROADS**

The paper discusses the modern progressive rapid mass transit system designed to be a comprehensive public transportation network in Atlanta, Ga.

Anderberg, K (American City & County, Georgia) **American City and County Vol. 98 No. 10, Oct. 1983, 7p**

ACKNOWLEDGMENT: EI  
ORDER FROM: ESL

**31 384580**  
**TWO METROS OPEN IN EASTERN USA**

Some of the features are described of two new metro systems at Miami and Baltimore, USA which each have opened recently. A common car design was imposed on the two cities by UMTA and both have opted for similar design parameters. The prevailing environments in the two cities have however led to key differences in construction, operation and fare collection. Each system has only one line, is opening in two stages and has plans for expansion. Good access to the central business area has been provided in Baltimore by building a 7.2km tunnel across the centre. This has not been possible in Miami due to the high water table and poor ground composition and the metro has therefore to pass around the central area on a viaduct, with consequent loss of access. In order to provide a better service to the central business area a 3km rubber-tyred peplemover loop line is under construction. Preliminary engineering has been completed for a second peplemover route in the north of the city. Both systems have a 2-stage automatic train control system, though fare collection techniques differ because of differing public transport policies, Baltimore having a five-zone network with the metro operating in two of the zones, while Miami has a flat fare scheme with an add-on transfer charge. (TRRL)

**Railway Gazette International SERIAL Vol. 139 No. 12, Dec. 1983, pp 940-942, 2 Fig., 2 Tab., 5 Phot.**

ACKNOWLEDGMENT: TRRL (IRRD 274432)  
ORDER FROM: ESL

31 384623

**BIKING TO WORK IN MIAMI. FINAL TECHNICAL REPORT**

The objective of the project was to produce and distribute a guide to commuting by bicycle in the Miami metropolitan area. The area is uniquely suited to bicycling because of its pleasant year-round climate and relatively flat topography. Persuading even a small percentage of automobile commuters to try biking to work could result in substantial energy savings in Miami as in most other major metropolitan areas. Seven of the largest employment centers in the area were selected as major commuter destinations suitable for bicycle commuters. Safe and scenic ways of commuting to these areas by bicycle were mapped and described in a series of short narratives. Additional material on safe riding techniques and the choice of equipment was developed. The resulting 40 page booklet, *Biking to Work in Miami*, was printed and distributed by the author to local cycling groups, bicycle interests, and others. Copies were also sent to interested parties outside the Miami area. The initial reception has been very encouraging and a number of favorable reply cards have been received with useful comments and suggestions. A revised version aimed at stimulating bikers to avail of the soon-to-be-opened rapid transit system is being considered. A writer for the Miami Herald is interested in using parts of the Guide for a series in the newspaper.

Kerr, O

Kerr (Oliver) DOE/R4/10288-TI, Aug. 1982, 54p

ORDER FROM: NTIS DE84000753

31 384628

**REGIONAL TRANSPORT IN THE NETHERLANDS [LES TRANSPORTS REGIONAUX AUX PAYS-BAS]**

Present organisation of regional public transport in the Netherlands: present developments, standardisation of services, tariff integration, interface with urban and local transport, financing. [French]

Bailet, JF *Transport Public* No. 810, Nov. 1983, pp 9-16, 2 Tab., 9 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: Union des Transports Publics, Urbains et Regionaux, 5 Rue d'Aumale, F-75009 Paris, France

31 384648

**PUBLIC TRANSPORT IN THE USSR [LES TRANSPORTS PUBLICS EN URSS]**

Short introduction to public transport in the form of tramways, buses, trolleybuses and underground systems in the USSR. Traffic and rolling stock development, as well as railway network planning are briefly studied. [French]

Klopotov, K *UITP Revue* Vol. 32 No. 3, Sept. 1983, pp 223-228

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: International Union of Public Transport, Avenue de l'Uruguay 19, B-1050 Brussels, Belgium

31 384914

**MIAMI METRORAIL POINTS TOWARD GROWTH**

While its initial 11-mile, 10-station South rapid-transit line opens, Metro-Dade Transportation Administration continues construction on the 10-mile continuation into Miami's northwestern quadrant and on the downtown people-mover which will cover the central business district. Plans are already underway for 22 miles of Stage II extensions. The city-center AGT system is the first to begin construction under UMTA auspices. This people mover is the Westinghouse Skybus, an automatic shuttle that will operate on an initial 1.9-mile double loop. Because of the high water table and porous coral limestone underlying Miami, subway construction was ruled out and virtually all the rapid transit line is elevated. Details of the structure and track construction are included. Cars were ordered under a joint contract with Baltimore and will be operated as married pairs in trains up to 6 cars. The trains will be operated under automatic train operation and fare collection will be automated.

*Progressive Railroading* Vol. 27 No. 3, Mar. 1984, p 57, 9 Phot.

ORDER FROM: Murphy-Richter Publishing Company, 20 North Wacker Drive, Chicago, Illinois, 60606

31 385247

**THE USE OF HIGH-SPEED VESSELS IN URBAN FERRY SERVICE: ISSUES AND ECONOMIC EVALUATION**

The economic aspects of high-speed ferry operations are discussed and compared to conventional ferry services. The economic viability of high-speed service is demonstrated using conventional economic analysis techniques. Issues related to high-speed ferry operations such as safety, efficiency, and ridership attraction are discussed in more general terms. The paper concludes that high-speed ferry operations can compare favorably with conventional services and hold potential for attracting larger numbers of passengers and charging premium fares.

This paper appeared in *Transportation Research Record* No.925, Inland Water Transportation.

Roess, RP Grealy, PJ (Polytechnic Institute of New York)

*Transportation Research Record* No. 925, 1983, pp 9-12, 3 Tab., 2 Ref.

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31 385261

**SEATTLE'S LOVE AFFAIR WITH TROLLEYS**

Trolleys have been a major, if not dominant component of Seattle's transportation system for more than forty years. This article retraces the history of the trolley system since 1939 when it was first approved, through 1973, when Metro, a consortium of Seattle, King County, and Suburban county governments, provided a plan that called for replacing the entire system, doubling the lineage to 55 miles and acquiring 109 new trolleys. The author relates then the problems created by new technology and gives the present status of the system.

This paper appeared in TRB Special Report 200, *The Trolley Bus: Where It Is and Where It's Going*. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Benson, GE *Transportation Research Board Special Report* No. 200, 1983, pp 9-10

ORDER FROM: TRB Publications Off

31 385262

**THE DAYTON EXPERIENCE**

Unlike that of other cities in the U.S., the Dayton trolley system, started in 1933, did not experience decline in the 1960s. In fact the reverse was true and extensions were made to keep pace with the city's outward growth. This article discusses the rehabilitation and growth of the system and looks at technological advances under investigation.

This paper appeared in TRB Special Report 200, *The Trolley Bus: Where It Is and Where It's Going*. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington, conducted by TRB and Sponsored by UMTA.

Dyer, FC *Transportation Research Board Special Report* No. 200, 1983, pp 10-11

31 385263

**VANCOUVER AND THE TROLLEY BUS**

After a brief historical sketch of the Vancouver trolley system, the author describes their new-generation trolley bus, with microprocessor control, full regenerative brake, off-wire battery operation, and double front doors.

This paper appeared in TRB Special Report 200, *The Trolley Bus: Where It Is and Where It's Going*. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Parkinson, TE *Transportation Research Board Special Report* No. 200, 1983, pp 11-12

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31 385264

**TROLLEY COACH APPLICATIONS IN THE 1980S: TORONTO UPDATE**

This paper reviews the socioeconomic aspects of trolley bus conversion within the present context of the Toronto Transit Commission. Areas of future research are suggested.



This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Wenning, PA Transportation Research Board Special Report No. 200, 1983, pp 12-16, 3 Fig.

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31 385265

## THE TROLLEY COACH IN EUROPE AND OTHER PARTS OF THE WORLD

This is a brief presentation of the status of the trolley bus in Europe and to a certain extent the remainder of the world outside of North America. It shows that the trolley bus mode is receiving serious consideration throughout the world and that its renaissance is not a passing phase.

This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Wilkins, JD Transportation Research Board Special Report No. 200, 1983, pp 16-20

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31 385266

## TROLLEY BUS DEVELOPMENT IN BRAZIL

The rehabilitation and expansion programs of the trolley bus system for Sao Paulo, Recife, Santos, and Araraquara, and the installation of the new system in Ribeirao Preto are described. Operating companies are trying to modernize and rationalize their services and industries are trying to procure new technology and modernize subsystems.

This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Christovan, FAN Waisman, J Transportation Research Board Special Report No. 200, 1983, pp 20-22

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32 380169

**PARATRANSIT: OPTIONS FOR THE FUTURE. AN OVERVIEW**

Over the past decade paratransit has evolved but is seen as not yet at its full maturity. Paratransit services have been shown to be capable of meeting various transportation needs well-served neither by mass transit or the private auto. Typically small in scale and flexible in structure, paratransit options can be targeted to particular market segments or they can be designed to provide community-wide service. Paratransit options can provide cost-effective service in areas lacking the densities necessary to support mass transit, and can be operated in the private sector, thus needing no extensive public financial support. Given the appropriate regulatory environment, these characteristics combined with the economic and demographic factors and trends described earlier, should result in an increased role for paratransit over the coming decade. It is concluded that the private sector should be involved to a greater extent; that the role of the activity center (employers, shopping centers, etc.) should be encouraged; service initiation should be at the community level; transit authorities should be more open to paratransit; coordination of all providers of public transportation should be achieved; states should promote paratransit; demonstrations of service and institutional concepts should continue; and the Federal government should create an environment conducive to utilization of paratransit.

Multisystems, Incorporated, Urban Mass Transportation Administration, Office of the Secretary of Transportation Final Rpt. DOT-I-83-8, Dec. 1982, 78p, Tabs., Photos., 13 Ref.

ORDER FROM: OST

32 380181

**GLOUCESTER COUNTY SOCIAL SERVICE TRANSPORTATION STUDY FINAL REPORT**

Gloucester County is in southwestern New Jersey; already 13 municipalities in this suburban and rural jurisdiction have subsidized shuttle buses which are available to all residents with priority being given in some cases to senior citizens. The public transit available tends to be work-trip oriented and focused on nearby Philadelphia. There are also some specialized services for elderly and handicapped. This study was made to assess social service transportation resources and needs in order to identify possible improvements. Alternative operations were evaluated for meeting the needs of residents and operating agencies. Implementation plans and monitoring methods were developed. Existing resources and their uses were identified, as well as gaps and duplications in services. The users, trip purposes and geographic areas involved were studied. A series of alternatives were developed for a Steering Committee which recommended consolidation through a non-profit entity. Since this would require time, it was recommended that as interim strategy there be coordination through a broker.

Price Waterhouse and Company UMTA-PA-09-0093, Mar. 1983, v.p., 2 App.

ORDER FROM: Price Waterhouse and Company, 1801 K Street, NW, Washington, D.C., 20006

32 380196

**VANPOOLING FOR PROFIT: A BUSINESS OPPORTUNITY**

Questions to ask and calculations to make to judge whether a vanpool is a practical business are detailed. The need for the service and the regulatory barriers are discussed. Financial calculations involving business and tax planning include calculating the cash flow for each year of the operation.

Schuck, L. Welch, B  
Alliance to Save Energy, Department of Energy DOE/CS/24448-T2,  
Aug. 1982, 55p Contract F G01-80CS24448  
ORDER FROM: NTIS

32 380203

**COOPERATIVE FORMS OF ORGANIZATION IN THE TAXICAB INDUSTRY**

Factors such as increases in operating and capital costs, new public transit policies, and new arrangements within the taxicab industry have created significant changes and reflect a transition period in the taxicab industry that generated this study. The authors point out the importance for the taxicab industry, transit policy planners, and local regulatory policy makers to understand these new types of taxicab organizations (cooperative-share

arrangements, lease-driver, owner-driver), their operations and adjustments to different regulatory environments. This report provides an indepth examination of cooperatives and an assessment of their importance to the industry, to their employees, and local policymakers. The study focuses on these nontraditional taxicab organizations, with emphasis on the cooperative firm. This report builds on survey and indepth interview information obtained from 14 taxicab cooperatives in the early 1980s. General findings indicate that taxicab cooperatives in the U.S. tend to operate more cabs than the industry-wide average, are more prevalent in medium-to-large cities, less likely to hold high market shares in their service areas, and grew at three times the industry rate during 1978-81. Four different forms of nontraditional taxicab organizations are identified in this report: industry service companies, operator service coops, operator producer coops, and employee coops. This report discusses the cooperatives' effect on driver incentives and service quality, career drivers, and management styles. A number of policy recommendations are directed toward public bodies responsible for taxicab regulations.

Bergman, EM Stein, JI  
North Carolina University, Urban Mass Transportation Administration  
Final Rpt. UMTA-NC-11-0009-83-4, June 1983, 91p, Refs.

ORDER FROM: NTIS PB83-253237

32 380782

**PHOENIX TRANSIT SUNDAY DIAL-A-RIDE**

A local taxi operator began subsidized dial-a-ride service in Phoenix, AR, when the city found that Sunday fixed-route transit service would be more costly. Regular cabs and wheelchair vans are billed at a fixed hourly rate less fares collected. Over 26 months 233 riders used the service on each Sunday. Almost all riders indicated the importance of the service to their transportation needs—church attendance, shopping and visting—and indicated they do not own an automobile or drive. Total cost per passenger trip (2.1 trips per hour per vehicle) was \$7.67 with a farebox recovery rate of 13.4%. Productivity is closely monitored. Annual subsidy cost at current demand is considerably less expensive than fixed route buses, but does attract lower ridership. Sunday public transportation using taxis in Phoenix may be somewhat unique because the taxi operator already had dial-a-ride services in adjacent areas, had a trusting relationship with the City of Phoenix and there was no 13(c) labor provisions involved because there was no prior Sunday bus service.

Flynn, S Crain, J  
Crain and Associates, Incorporated, Urban Mass Transportation  
Administration, (DTS-64) Final Rpt. UMTA-MA-06-0049-83-7, DOT-  
TSC-UMTA-83-34, Aug. 1983, 76p, 3 Fig., 10 Tab., 4 App.  
Contract DOT-TSC-1408  
ORDER FROM: NTIS PB84-123090

32 380795

**URBAN TRANSPORT IN DEVELOPING COUNTRIES: THE PESEROS OF MEXICO CITY**

While transport problems abound in every part of the world, problems of congestion are particularly urgent in large cities. This book describes the operation of the Peseros in Mexico City—jitney-like vehicles. Cheaper than a taxi and faster than the bus, they serve millions in crowded Mexico. Included is detailed information on their routes, their riders, their drivers, and the economics of their operations.

Roschlau, MW  
British Columbia University, Canada No Date, 193p, Tabs.

ORDER FROM: British Columbia University, Canada, Centre for  
Transportation Studies, Vancouver V6T 1W5, British Columbia,  
Canada

32 380868

**LONDON'S MINIBUS POSER**

Following the introduction of the 1980 Transport Act, two companies—Associated Minibus Operators Ltd (AMOS) and Vulcancrown Ltd—are hoping to operate minibus services within the London area pending the outcome of London Transport enquiries into the applications. The AMOS proposal is planned to operate on four routes across London using 16-seat minibuses running through the city centre with a headway of 2 min at peak time and 4 min outside peak times. The Vulcancrown plan is to operate virtually a taxi service between Gatwick, Heathrow and Luton airports

using minibuses on routes which cannot be fixed due to the nature of the service. Because labour costs are such a high proportion of public transport costs, such minibus services must be more labour-intensive compared with conventional bus services. If minibus services of this type are to compete with subsidised transport services then the risk of low wages or sub-standard servicing must be guarded against in uncertain market conditions. The article considers the case for the introduction of minibus services and implications for other areas. (TRRL)

Hamer, M *Transport (London)* Vol. 4 No. 3, May 1983, pp 9-10, 1 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 270525)  
ORDER FROM: City Press Limited, Fairfax House, Colchester, Essex CO1 1RJ, England

**32 380900**  
**A MODEL TO ASSESS COST AND FUEL SAVINGS FROM RIDE SHARING**

A model based on geometric probability concepts is developed to assess the performance of carpooling and vanpooling strategies. Fuel consumption and operating cost issues are treated in the paper, and the model can be extended to treat travel time and air quality issues also. It is shown that simple calculations of the fuel saved through carpool programs can overstate the savings by a factor of two. The operating costs of vanpools and carpools are also compared. (Author/TRRL)

Kocur, G (Dartmouth College); Hendrickson, C (Carnegie-Mellon University) *Transportation Research. Part B: Methodological* Vol. 17B No. 4, HS-035 764, Aug. 1983, pp 305-318, 2 Fig., 4 Tab., 14 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 271156)  
ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

**32 381298**  
**EFFECTS OF TAXI REGULATORY REVISION IN SAN DIEGO, CALIFORNIA**

Effective January 1979 the City of San Diego removed its previous ceiling on taxi licenses and began issuing 6 new taxi permits every month; in July, this limit was raised to 15. In August, the city replaced the standard rate of fare with a variable pricing policy under which taxi companies may file and charge individually-determined rates. An initial maximum rate was removed in October 1980. This Final Report evaluates the effects of these taxi regulatory revisions on local taxi service suppliers, taxi users, and taxi regulators. Evaluation issues included changes in the level and quality of taxi service, taxi user characteristics and awareness of service, taxi service productivity measures and the administrative efforts involved in implementation. Since the city's code changes affected taxi industry size and operations at San Diego International Airport and in San Diego County, special attention was also paid to interjurisdictional issues.

Gelb, PM  
De Leuw, Cather and Company, Urban Mass Transportation Administration, (DTS-64) Final Rpt. UMTA-CA-06-0127-83-1, HS-035 462, May 1983, 336p, Figs., Tabs., 4 App. Contract DOT-TSC-1409  
ACKNOWLEDGMENT: National Highway Traffic Safety Administration  
ORDER FROM: NTIS PB83-237255

**32 381465**  
**TAXIBUS IN ALINGSAAS. PROPOSAL FOR A DIAL-A-BUS SYSTEM FOR THE CITY OF ALINGSAAS [TAXIBUSS I ALINGSAAS. FOERSLAG TILL TAXIBUSSYSTEM I ALINGSAAS TAETORT SAMT JAEMFOERELSE MED ETT KONVENTIONELLT BUSSYSTEM]**

The aim of this study is to analyse a model of a taxibus system in the city of Alingsaas which has approximately 20000 inhabitants. The design of the system and comparisons of the standards and the costs of this system and the existing bus system are presented. There is also a more general part about taxibuses included in this study where a number of existing taxibus systems are described. The increase of taxibus travel is assumed to be 50%, and the system is designed on that basis. The positive effects of the system should be better service with more frequent journeys, 30% shorter journey time, and door to door service. (TRRL) [Swedish]

Peterson, M Winberg, A  
Chalmers University of Technology, Sweden Monograph TACTH Exam 1981:4, 1982, 77p, Figs., Tabs., 1 Phot., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 271678), National Swedish Road & Traffic Research Institute  
ORDER FROM: Chalmers University of Technology, Sweden, Trafikplanering—Arkitektur, Fack, S-402 20 Goeteborg 5, Sweden

**32 381471**  
**ECONOMIES OF SCALE IN THE TAXICAB INDUSTRY**

In the article a multiple regression analysis is used to estimate the relationship between taxicab company costs and size. The results of both the cost per passenger trip and cost per passenger mile models are said to imply a u-shaped average cost curve for small to medium sized taxicab companies. It is shown that with up to 50-60000 trips per year average costs fall while from 75-250000 trips per year, average costs increase. The cost per vehicle mile model implies that one reason for decreasing average costs of very small operators is that vehicles are not used as intensively as in larger operations. As the number of vehicles increases, further reductions in costs per vehicle mile are relatively small. (TRRL)

Pagano, AM McKnight, CE (Illinois University, Chicago) *Journal of Transport Economics and Policy* Vol. 17 No. 3, Sept. 1983, pp 299-313, 5 Fig., 2 Tab., 17 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272592)  
ORDER FROM: Bath University, England, Claverton Down, Bath BA2 7AY, England

**32 381487**  
**PARATRANSIT—THE RIVERSIDE EXPERIENCE**

This article describes the five types of dial-a-ride services of the Riverside Transit Agency (RTA) in California. The first and major dial-a-ride service is provided to the general public with no restriction for age or handicap. It is provided in an open form and a zonal form. The second dial-a-ride service is provided by a subsidized taxi program referred to as "user-side subsidy". The third type of dial-a-ride is provided by a fixed route deviation. The fourth type is the only service operated exclusively for elderly and handicapped in a very low-density area. The fifth type is a non-profit company which provides specialized transportation of the physically and mentally handicapped for workshops, as well as trips for senior citizens to meal programs, medical appointments and senior activities. In addition to dial-a-ride, the RTA also operates three buspools to Orange County and ten rural vanpools from the Riverside Area to places of employment.

Rall, D Kaufher, K (Riverside Transit Agency) *Transitions* 1983, pp 9-18

ORDER FROM: ATE Management and Service Company, Incorporated, Editor, 617 Vine Street, Suite 800, Cincinnati, Ohio, 45202

**32 381491**  
**PARATRANSIT ENERGY EFFICIENCY: LESS THAN MEETS THE EYE**

This paper presents a simple analysis which shows that under reasonable conditions the introduction of a paratransit system results in an overall decline in the energy efficiency of a region's transportation system. It is shown that system-wide marginal fuel consumption per additional person-trip may be quite high unless the region has significant latent demand which is captured in large part by the paratransit system. Surprisingly, shifts to paratransit from auto are shown to degrade overall system efficiency, in sharp contrast to the effect of shifts to fixed-route bus from auto. This is due primarily to the circuitous nature of typical paratransit routes, a consequence of scheduling constraints. This analysis demonstrates that the use of passenger-miles per gallon as a measure of fuel efficiency may lead to seriously erroneous results because it focuses on an individual mode ignoring system level effects such as mode shifting.

Sexton, TR (State University of New York, Stony Brook) *Specialized Transportation Planning and Practice* Vol. 1 No. 4, 1983, pp 291-307, 12 Fig., 3 Tab., 3 Ref., 1 App.

ORDER FROM: Gordon and Breach Science Publishers Limited, 42 William IV Street, London WC2N 4DE, England

32 381492

**SUBURBAN TAXICAB TRANSPORTATION: AN ANALYSIS OF COSTS AND A COMPARISON WITH SPECIAL SERVICES PARATRANSIT**

Taxicab transportation can provide an important transportation alternative to the private automobile in low density areas which cannot readily be served by traditional fixed route systems. Taxis can also help to satisfy the special transportation needs of the elderly and handicapped. An important question is how to provide taxi services in the most cost-effective manner possible. This paper examines both issues through an analysis of taxicab costs. Data was collected from a sample of taxicab companies in the metropolitan Chicago area. The cost of providing taxicab services in the sample is analyzed and a comparison with special services costs is made. The paper concludes that a substantial subsidy may be required to service the general public in low density areas, that economies of scale in taxicab services may exist and that shared ride taxi can be an effective alternative for transportation for the elderly and handicapped.

Pagano, AM McKnight, C (Illinois University, Chicago); Robins, L (Roosevelt University, Illinois); Johnson, C (American Public Works Association) **Specialized Transportation Planning and Practice** Vol. 1 No. 4, 1983, pp 309-323, 1 Fig., 4 Tab., 12 Ref.

ORDER FROM: Gordon and Breach Science Publishers Limited, 42 William IV Street, London WC2N 4DE, England

32 381496

**ISSUES ASSOCIATED WITH PARATRANSIT BROKERAGE: THE ACCESS EXPERIENCE**

ACCESS is a brokerage of specialized transportation services for the elderly and handicapped in Allegheny County, Pennsylvania which has been in operation for over four years. ACCESS coordinates the delivery of specialized services for the Port Authority of Allegheny County and roughly thirty social service agencies, through management of contracts with eleven paratransit carriers. This paper compares the ACCESS brokerage experience with similar projects elsewhere, in order to assess the impact of some fundamental characteristics of both the community and the project design on the outcome of various brokerage programs.

Forstall, K (Multisystems, Incorporated) **Specialized Transportation Planning and Practice** Vol. 1 No. 4, 1983, pp 371-381, 5 Ref.

ORDER FROM: Gordon and Breach Science Publishers Limited, 42 William IV Street, London WC2N 4DE, England

32 381497

**STATISTICAL CONTROLS IN RIDESHARING DEMONSTRATION PROGRAMS**

The application of scientific experimental designs in ridesharing demonstrations is discussed. A review of typical designs, particularly those that use test and control groups and over-time observations of behavior, suggests that the numerous problems that jeopardize the validity of studies could be reduced or eliminated. Nine possible outcomes of demonstrations are reviewed and interpreted against the need for experimental designs. Two applications in the ridesharing area are then described: one conducted during a period of rapid background change (1979 energy crisis) and the other in a recent period of stability (1981). In both cases (conducted at employer and community sites in the Albany, New York, area), the use of a control group and before-and-after background surveys permitted isolation of the true effects of the demonstration. In the first case (1979 energy crisis), this included the direct effect of the program (from coordinator records), indirect effects (from the existence of the ridesharing program itself), and external effects (from the energy crisis). In the second case (stable background), the indirect and external effects were found to be negligible. From this study it is concluded that the use of scientific designs in ridesharing analysis should be increased and expanded.

This paper appeared in Transportation Research Record No. 914, Transportation Innovations: Ridesharing Techniques and Public-Private Cooperation. See also TRIS 366928, UMTRIS 8202 Bulletin, Subject Area 32 page 114.

Hartgen, DT Brunso, JM (New York State Department of Transportation) **Transportation Research Record** No. 914, 1983, pp 1-9, 2 Fig., 8 Tab., 11 Ref.

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32 381498

**IMPACT OF FLEXTIME WORK SCHEDULES ON AN EMPLOYER-BASED RIDESHARING PROGRAM**

The impact on commuting behavior of employees when flexitime is superimposed on a large employer-based ridesharing program is discussed. The case study uses the Tennessee Valley Authority (TVA) program in downtown Knoxville, Tennessee. Based on the first 6 months of experience with TVA's Knoxville flexitime program, it is shown that giving employees greater choice in working hours can serve to upset an established ridesharing program. It must be noted that the TVA ridesharing program is unique in that it provides a high level of consumer-oriented services. Buses operate equivalent to a subscription program and, along with vans, arrive just before the work day starts and leave immediately at the end of the work day. The element of choice then adds complexity to the operations. With shifting demands for different starting and leaving times, it becomes difficult to balance the services with the demand. Also, it is difficult for 35 to 40 people who use the same vehicle to reach a mutually agreed on schedule. Van operations are easier to adapt to flexitime because the decisions involve a smaller number of individuals and decisions can be made at the decentralized level of the van. However, when individuals are accustomed to receiving a high level of commuter service, and events take place to spread that demand over a longer time period, readjustments in travel behavior and accompanying services will be required. These adjustments will require the provision of additional commuter services. As TVA's experience indicates, without service adjustments, people will make use of the flexitime opportunities by carpooling or by driving alone. Both ridesharing and flexitime are important concepts for energy conservation. However, when flexitime is added to a large customized ridesharing program, the net energy savings will not equal the sum of both energy conservation actions taken singularly.

This paper appeared in Transportation Research Record No. 914, Transportation Innovations: Ridesharing Techniques and Public-Private Cooperation.

Wegmann, FJ (Tennessee University, Knoxville); Stokely, SR (Tennessee Valley Authority) **Transportation Research Record** No. 914, 1983, pp 9-13, 2 Fig., 2 Tab., 4 Ref.

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32 381499

**MEASURING THE EFFECTIVENESS OF PERSONALIZED RIDESHARING ASSISTANCE**

Cumbersome data-collection techniques hinder evaluations of many ridesharing programs. Fundamental performance measures have eluded researchers, who often depend on infrequent surveys of ridesharing program participants for their data. The Share-A-Ride program in Silver Spring, Maryland, however, has developed a reliable evaluation process that does not depend on special surveys. Share-A-Ride uses an ongoing data-collection effort based on followup telephone calls to program participants. The resulting information helps make the program responsive to its clients and serves as a basis for detailed evaluation. Share-A-Ride has raised pool formation rates beyond those typically produced by traditional ridesharing programs. Approximately 54 percent of Share-A-Ride's participants who were active at the 2-year mark of program operations had formed new ridesharing arrangements. Attrition claimed a significant number of participants, which emphasizes the importance of rematching participants and maintaining data base integrity. The average participant received three follow-up calls from Share-A-Ride staff. More than half of the new ridesharers did not start pooling until after their first follow-up call. Nearly three-quarters of the participants who were sent matches for pooling ultimately contacted others on their lists. The evaluation also measured staffing requirements for implementing the personalized approach. The Share-A-Ride experience shows that labor can be reduced after the initial 2 years of program operations. Although the labor-intensiveness of personalized ridesharing assistance makes it somewhat more expensive than traditional approaches, the resulting benefits are significant.

This paper appeared in Transportation Research Record No. 914, Transportation Innovations: Ridesharing Techniques and Public-Private Cooperation.

Hershey, WR (Maryland-National Capital Park & Planning Comm); Hekimian, AJ (Sverdrup and Parcel and Associates, Incorporated) **Transportation Research Record** No. 914, 1983, pp 14-21, 10 Fig., 2 Tab., 7 Ref.

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**32 381500**

**MARKET FOR VANPOOLING IN THE BALTIMORE REGION**

A market-estimation procedure is proposed that is based on computer-simulated work trips that occur in the Baltimore region. It identifies cluster (large than 60) of long (greater than 10 miles one way) work trips between all 94 planning districts in the region. The number of trips selected is reduced by factors that depend on the percentage of workers at the destination who are employed at establishments that have more than 200 and 100 employees. The number of qualifying trips is increased if they originate in residential districts that have a significant percentage of dwelling units in clusters larger than 200. From the population of trips so selected, a subset of trips for which vanpooling is cheaper than carpooling or driving alone is identified. Trip costs are estimated by using a model that recognizes time as well as travel costs. Vanpooling is less costly, and thus more attractive, for commuting distances longer than an equal-cost distance. Under 1980 conditions, that distance is large enough so that the achievable market is limited to 200 vanpools. However, as perceived driving costs, the price of fuel, or parking costs increase, the equal-cost distance decreases and an estimated market of more than 2,000 vanpools could be achieved.

This paper appeared in Transportation research record No. 914, Transportation Innovations: Ridesharing Techniques and Public-Private Cooperation.

Bailey, JM (Regional Planning Council) *Transportation Research Record* No. 914, 1983, pp 22-26, 2 Tab., 10 Ref.

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**32 381501**

**COMMUNITY-BASED RIDESHARING: AN OVERLOOKED OPTION**

The neighborhood ridesharing demonstration, which took place in four residential communities in the Albany, New York, area, is described. The project tested whether personalized coordinator techniques could be used at the home end because residential areas offer homogeneous neighborhoods with established social networks. Careful test design and internal recording allowed for a rigorous evaluation and comparison with other approaches. The neighborhood ridesharing coordinator program was shown to be a viable concept. Coordinators were successful in organizing ridesharing from the home end. The advertising methods found to be most successful were word-of-mouth, newspaper articles about the program, and community group meetings. In comparison with employer-based coordinators, neighborhood coordinators were equally effective in the number of placements and in cost-effectiveness measures. Given that employer ridesharing programs gradually rise to a saturation point, a neighborhood program, which has a larger population base and continuous changeover in residents, has possibilities for cost-effective expansion.

This paper appeared in Transportation Research Record No. 914, Transportation Innovations: Ridesharing Techniques and Public-Private Cooperation.

Brunso, JM Hartgen, DT (New York State Department of Transportation) *Transportation Research Record* No. 914, 1983, pp 26-33, 1 Fig., 7 Tab., 14 Ref.

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**32 381503**

**EVOLVING INSTITUTIONAL ARRANGEMENTS FOR EMPLOYER INVOLVEMENT IN TRANSPORTATION: THE CASE OF EMPLOYER ASSOCIATIONS**

Many professionals are involved in the urban transportation planning process. The characteristics of a relatively new participant in urban transportation issues—the employer association—are examined. Five California employer associations, and their role in transportation, are described. The analysis emphasizes the factors that influenced the creation of these associations and the characteristics of their operation. Although still in their infancy, these associations have shown some impact on their respective urban areas. The roles played by these associations have ranged from facilitating the resolution of transportation controversies to conducting planning studies of critical problems facing employer sites. It is concluded that employer associations could play an important role in transportation in many urban areas. Some key problems in the creation and

maintenance of such associations include obtaining and keeping corporate commitment to the association, establishing the legal status of the group, creating a useful funding mechanism, and establishing effective relations with public-sector agencies. Finally, some of the potential implications of employer associations, with respect to other participants in urban transportation, are postulated.

This paper appeared in Transportation Research Record No. 914, Transportation Innovations: Ridesharing Techniques and Public-Private Cooperation.

Schreffler, E Meyer, MD (Massachusetts Institute of Technology) *Transportation Research Record* No. 914, 1983, pp 42-49, 2 Fig., 13 Ref.

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**32 381504**

**PARATRANSIT AT A TRANSIT AGENCY: THE EXPERIENCE IN NORFOLK, VIRGINIA**

The objective of this project was to test the feasibility of a transit agency's development and provision of alternative, lower-cost transportation services. Demand-responsive and fixed-route paratransit service were substituted for unsatisfactory bus services in low-to medium-density areas and introduced in unserved suburban and rural areas. Services were extensively monitored, and the results are reported. The new services failed in new service areas due to lack of riders. Where bus service was severely reduced or eliminated, substitute services were largely successful in continuing to attract a substantial ridership at lower cost (deficit) to the transit agency. Major problems, including opposition by the transit union and some private service providers, and also some operational problems are discussed.

This paper appeared in Transportation Research Record No. 914, Transportation Innovations: Ridesharing Techniques and Public-Private Cooperation.

Becker, AJ Echols, JC (Tidewater Regional Transit) *Transportation Research Record* No. 914, 1983, pp 49-57, 2 Fig., 6 Tab.

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**32 381506**

**CONDUCTING TRANSPORTATION SYSTEM MANAGEMENT STUDIES OF TAXICABS: LESSONS FROM THE MILWAUKEE EXPERIENCE**

From 1978 through 1980, the city of Milwaukee conducted a transportation systems management type study of taxicab service and regulation. In order to provide guidance for other cities considering undertaking similar studies, an evaluation of the Milwaukee study was made. The Milwaukee study was compared against 13 evaluation criteria suggested in the transportation planning literature. The findings of the evaluation were that future taxicab studies could incorporate the strengths of the Milwaukee study and avoid its weaknesses by following 11 guidelines: develop measurable objectives, limit data collection to data needed for problem identification and problem analysis, do field work, maximize use of existing data, emphasize problem identification, set priorities for problems, involve other agencies, involve affected parties, develop alternate solutions, develop strategies for implementation of the recommendations, and require recommendations to be compatible to the maximum extent feasible, but allow early implementation of solutions to serious problems.

This paper appeared in Transportation Research Record No. 914, Transportation Innovations: Ridesharing Techniques and Public-Private Cooperation.

O'Connell, BF (Milwaukee Department of City Development) *Transportation Research Record* No. 914, 1983, pp 60-66, 1 Fig., 5 Ref.

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**32 381507**

**COMPARISON OF USER-SIDE SUBSIDY AND DIAL-A-RIDE SERVICES OPERATED IN LOS ANGELES**

The study is a comparative analysis of the dial-a-ride and user-side subsidy community transit service operations provided in Los Angeles. The study concentrates on two project areas, Venice and West Central, in which dial-a-ride services operated in 1980 were replaced with user-side subsidy operations in 1981. The dial-a-ride service, as operated in Los Angeles,

requires a contractor to provide a specific number of vehicle hours of service per month; the contractor is compensated on that basis. The user pays a fixed fare regardless of the length of trip. The trip must be arranged at least 24 hr in advance and is provided between the hours of 9:00 a.m. and 5:00 p.m. on weekdays. The user-side subsidy program requires the user to purchase coupons that are good for 24-hr service from any participating taxicab company of the user's choosing. The broker subcontracts with the taxicab operators to reimburse them for the coupons they receive. The user is allowed to use up to \$5.00 in coupons for each one-way trip and must pay in cash any amount over the coupon limit. Three measures of comparison were used in the analysis: patronage, cost to the user, and cost per passenger. Under equal funding levels, more trips were provided by the user-side subsidy program. The user-side subsidy patronage exceeded the dial-a-ride patronage by 75 percent in Venice and 40 percent in West Central. Dial-a-ride fares were fixed at \$0.15/trip in 1980, but a new state law adopted for 1981 financing would have required the city to raise the dial-a-ride fares to an average of \$1.40/trip. The user-side subsidy service costs the user an average of \$0.92/trip. Over two quarters of operation, the user-side subsidy patronage grew considerably, reducing the costs to an average of \$5.63/passenger, approximately 60 percent of the dial-a-ride cost per passenger. The comparisons made in this study indicate that user-side subsidy service is superior to dial-a-ride service for Los Angeles.

This paper appeared in Transportation Research Record No. 914, Transportation Innovations: Ridesharing Techniques and Public-Private Cooperation.

Talcott, DB (Los Angeles Department of Transportation)  
**Transportation Research Record** No. 914, 1983, pp 66-71, 1 Fig., 1 Tab.

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32 381559

#### DIAL-A-RIDE IN THE U. K.—A GENERAL STUDY

The study assessed the performance of demand-responsive Dial-a-Ride bus services in 11 locations in England in terms of ridership and financial viability. The services operated up to nine 12 to 24-seater minibuses which called for, and often delivered, passengers at the door. Contacts were by telephone or hailing. Vehicles were invariably equipped with 2-way radios to allow redirection from the control centre. No practicable way of making DaR services profitable could be envisaged. DaR services were especially suited to low population-density areas such as suburbs and smaller towns, and to off-peak operation, often complementing existing bus services. Their door-to-door capability was especially appreciated by the elderly and the disabled.

Oxley, PR  
 Cranfield Institute of Technology, Transport and Road Research  
 Laboratory Final Rpt. CRANFIELD-CTS-12, 1976, 138p

ORDER FROM: NTIS PB83-255810

32 381563

#### PUBLIC TRANSPORT CO-ORDINATION AND THE ROLE OF SPECIAL TRANSPORT SERVICES

This paper discusses some ideas on the issues facing public transport coordinators. Effective co-ordination clearly requires a greater degree of both understanding of, and influence on special transport services by coordinators. In Sweden and in the U. S., the market segmentation approach to public transport is gaining in popularity. This means a much more accurate matching of the needs of users to the types of services and vehicles provided across the whole spectrum of services; including conventional bus and rail services, school transport and the many services for groups with special needs. Probably the most important pre-requisite for such a system in the U. K. is data. The need for some sort of client/user-based information system.

Bailey, J  
 Oxford University, England TSU/REF-197/CP, July 1982, 11p

32 381679

#### POOLING FOR THE JOURNEY TO WORK: THE OUTLOOK IN GREAT BRITAIN

Pooling, or ridesharing, is a term coined in the United States to describe various forms of collective travel organised for, and often by, specific groups of commuters with similar travel requirements. Its different forms

include bus pooling (financially self-supporting work bus or commuter coach services), minibus pooling (van pooling in US terminology) and car pooling. It has been claimed that these forms of collective travel offer a more personalised service than conventional stage carriage buses, and therefore have a greater chance of attracting solo car drivers and increasing vehicle occupancies. This in turn can lead to lower fuel consumption and reduced traffic congestion at peak times. Following the advent of oil shortages in the winter of 1973/74, considerable efforts were made in the US to promote pooling initiatives. This gave rise to the publication of a substantial volume of literature, that sometimes indicated significant resource-saving achievements. This paper considers the potential for bus, minibus and car pooling in Great Britain, drawing both on relevant theoretical and economic studies, and on practical operational experience. It concludes that under reasonable assumptions about the transport situation in the next decade or so, pooling could become increasingly useful for solving the travel problems of individual local groups, but that it is unlikely to become a major mode in terms of the numbers of trips carried. The effects of recent legislative changes are discussed and the justification for further change assessed. Comparisons are made with the us experience. (Author/TRRL)

Public Transport. Proceedings of Seminar M held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Greening, PAK Jackson, RL (Transport and Road Research Laboratory) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc** 1982, pp 113-130, 2 Fig., 3 Tab., 22 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272843)  
 ORDER FROM: Planning and Transport Res and Computation Co  
 Ltd, 110 Strand, London WC2, England

32 382610

#### A MODEL OF TAXI SERVICE UNDER FARE STRUCTURE AND FLEET SIZE REGULATION

This article presents a model of taxi service in a regulated market where radio dispatch and airport cabstand are the primary modes of operation. Regulators have the potential to affect market performance through two means: changes in the number of licensed cabs and changes in drivers' mode choice incentives brought about by revision of the rate structure. The model admits the possibility that certain regulatory reforms may benefit taxi drivers and customers simultaneously. The questions of whether these possibilities actually exist in a particular market are addressed empirically.

Schroeter, JR (Arizona State University, Tempe) **Bell Journal of Economics** Vol. 14 No. 1, 1983, pp 81-96, 1 Fig., 4 Tab.

ORDER FROM: American Telephone and Telegraph Company, 195  
 Broadway, Room 01-1940, New York, New York, 10007

32 382611

#### TAXICAB REGULATION IN U.S. CITIES. VOLUME 2: CASE STUDIES

This 2-volume study assesses the state of taxi regulations in U.S. cities and presents the results of a national study of taxicab regulatory practices. The study objectives are: 1) to determine how cities currently regulate taxis; 2) to assess the degree of taxicab regulatory changes being considered by cities; and 3) to identify reasons for taxi regulatory changes. The study focuses on three aspects of taxi regulations, namely—administrative procedures, entry controls, and fare setting. The research methodology included a literature review and data collections, a national telephone survey of 120 cities, and onsite case studies of ten cities that have recently made substantive taxicab regulatory changes. The ten case studies presented in this second volume are Sacramento and Fresno, California; Charlotte and Fayetteville, North Carolina; Dayton and Springfield, Ohio; Hillsborough County and St. Petersburg, Florida; Des Plaines, Illinois; and Madison, Wisconsin. The case study cities cover all important aspects of taxicab regulation and regulatory revision. This case study report, Volume 2, contains the case study reports that were completed as part of the study on state and local taxicab regulation. The U.S. cities were visited in June and July, 1983, for more in-depth study of their experiences with taxicab regulation. Information from the case studies is used extensively in Volume 1, but all of the final case study reports are included in this second volume as additional information for cities considering future changes in their taxicab regulation.

Shaw, LC Gilvert, G Bishop, C Pruitt, E

North Carolina University, Urban Mass Transportation Administration  
UMTA-NC-11-0011-84-2, Oct. 1983, 98p

ORDER FROM: NTIS PB84-156249

**32 382612**  
**TAXICAB REGULATION IN U.S. CITIES. VOLUME 1: FINAL REPORT**

In many U.S. communities, taxicab regulations have emerged not only as a local concern, but also as a challenge—the challenge of devising taxicab regulations that meet local conditions and objectives. This study assesses the state of taxi regulations in U.S. cities and presents the results of a national study of taxicab regulatory practices. The study objectives are: 1) to determine how cities currently regulate taxis; 2) to assess the degree of taxicab regulatory changes being considered by cities; and 3) to identify reasons for taxi regulatory changes. The study focuses on three aspects of taxi regulations: administrative procedures, entry controls, and fare setting. The research methodology included a literature review and data collection, a national telephone survey of 120 cities, and onsite case studies of ten cities that have recently made substantive taxicab regulatory changes. The ten case study cities are Sacramento and Fresno, California; Charlotte and Fayetteville, North Carolina; Dayton and Springfield, Ohio; Hillsborough County and St. Petersburg, Florida; Des Plaines, Illinois; and Madison, Wisconsin. Overall, the case study cities cover all important aspects of taxicab regulation and regulatory revision. The study results show that most cities regulate both entry into the industry and fare levels, and relatively few cities have changed, or are considering changing, to taxicab deregulation. The study also shows that in those cities with major regulatory changes, there is a common pattern followed with respect to how these changes have been considered and evaluated.

Shaw, LC Gilbert, G Bishop, C Pruitt, E  
North Carolina University, Urban Mass Transportation Administration  
UMTA-NC-11-0011-84-1, Oct. 1983, 118p

ORDER FROM: NTIS PB84-156231

**32 382719**  
**PRINCIPLES FOR ORGANIZING EXPRESS BUS SERVICES**

This paper discusses a method used for organizing a network of urban express bus services to cater for travel to work in a number of medium-sized Soviet cities. The method provides a chain of linked bus runs to service a matrix of passenger demands which vary over time. The experience of installing such a network of express bus works services in the city of Chiment is described. Passenger travel times were reduced by some 30%, while the express services consumed 30-40% less fuel than the equivalent stopping services. (Author/TRRL)

Afanasiev, LL (Moscow Automotive and Road Construction Institute); Liberman, SY (Moscow Automotive and Road Construction Institute) **Transportation Research. Part A: General Vol. 17A No. 5, Sept. 1983, pp 343-346, 4 Fig., 1 Tab., 5 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 273586)  
ORDER FROM: ESL

**32 382751**  
**THE TAXI MARKET: OPERATIONAL CHARACTERISTICS AND POLICY CONSEQUENCES**

The operation of taxis as means of urban transport present certain special characteristics which have originated a discussion in the literature about the most adequate operational structure for this market. In particular it has been debated whether it is more convenient to regulate its entrance or to allow for a completely free operation. In this paper various models of the taxi market appearing in the literature are presented and discussed and a new model of analysis is proposed. Building on the experimental results obtained for the Chilean case, the paper then analyses the consequences of deregulation for the various economic agents involved: users, operators and the public in general. Finally, an attempt is made to obtain some conclusions regarding the application of policies which appear as the more adequate to produce a social optimum. The Chilean case appears to be a very interesting laboratory for the validation of the theories which have been put forward. Indeed, the taxi market after a long history of regulated operation has recently been deregulated following the general policies of the Chilean government. (Author/TRRL)

Developing Countries. Proceedings of Seminar G held at the PTRC Summer Annual Meeting, University of Warwick, England, 4-7 July 1983.

Fernandez, JE (Pontifical Catholic University, Chile) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P237, 1983, p177**

ACKNOWLEDGMENT: TRRL (IRRD 273958)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**32 382788**  
**INFORMATION FOR REGULATING: THE CASE OF TAXIS**

The authors consider the problems of inferring relevant evidence in regulation studies. The model used depends on the assumptions of service at a given point, a single fare, uniform trip length and an infinitely elastic supply. Service elasticities of greater than unity can be ruled out under free-entry conditions. "Engaged" ratios yield little information but it can be helpful if a price elasticity of greater than unity can be established. Deductions on the range of other variables can then be made. It is found that profits cannot be used alone to indicate a desirable direction for a change in cab numbers. Regulators cannot alter prices and cab numbers to satisfy experimental design requirements. Cruising taxi trades operate in such a way so as to make necessary explicit valuation of the welfare of potential customers excluded from the valuations. Welfare may be improved by bringing into the market those with high valuations of time saved but who are deterred by low service levels. Free entry arguments should be used in decisions on the choice between regulation and competition. (Author/TRRL)

Beesley, ME Glaister, S **Economic Journal Vol. 93 No. 37, Sept. 1983, pp 594-615, 2 Fig., 1 Tab., 25 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 273769)  
ORDER FROM: Cambridge University Press, Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, England

**32 382792**  
**TRANSPORT SERVICE WITH MINIBUSES. 3 COMMUNITY BUS IN UDDARED: OCTOBER 1981-JUNE 1983 [TRANSPORTSERVICE MED MINIBUSSAR. 3 BYABUSS: UDDARED OKTOBER 1981-JUNI 1983]**

In the spring and summer of 1980 a draft for transport cooperation was produced for a "community bus". The community bus started at Ingared, in the municipality of Alingsås. This activity continued for two and a half years with breaks in the summers. Community bus means that the inhabitants in a neighbourhood themselves organize a feeder transport service between the neighbourhood and a bus or railway station. The community bus can also be used for spare time activities. By exemption from the edict about professional transport the community bus, a minibus for eight passengers, may be driven by persons with a driving licence for private cars. The community bus is to be seen as an integral part of the regional public traffic company (GL) and normal fare is valid. The traffic company answers for the costs of the vehicle and the residents organize and perform the service without remuneration. To improve the idea about community bus, a new project was started in October 1981 at Uddared, in the municipality of Lerum. The aim of this study was to: (1) continue the development of community bus as a transportation form for another residential area, (2) especially study the community bus being complementary to the existing taxi service, and (3) follow-up the patronage of the service, study energy savings made, and the attitudes of the passengers to the community bus as a form of transportation. The number of passengers on the Uddared-Floda station route increased from about 50 persons a day before the time of the community bus to about 225 persons a day in the winter of 1982/83. The driven distance with the community bus was nearly 180 kilometres a day on average in the period August 1982-June 1983. The fuel consumption was 1,5 litres per 10 kilometres. It was found that 90% of the households thought that the community bus was of great value to the inhabitants. Energy saving due to the community bus was estimated at about 15,000 litres of petrol a year, on average 70% of the capacity of the community bus was used. Every day 5-7 services had to be doubled. 31 persons (scholars excluded) increased their going by train from the time before the introduction of the community bus. The income accruing to GL through increased use of the community bus and train was estimated at about 5,900 sek a month. The costs were about 6,400 sek for the same period. The income covered 92% of the costs. The costs of the community

bus were estimated to be 1.76 sek per kilometre and a little more than 2 sek per passenger and journey. (TRRL) [Swedish]

Olsson, I  
Chalmers University of Technology, Sweden, (0349-2389) Monograph TACTH Rapport 1983:2, 1983, 39p, 10 Fig., Tabs., 8 Ref., Apps.

ACKNOWLEDGMENT: TRRL (IRRD 273681), National Swedish Road & Traffic Research Institute

ORDER FROM: Chalmers University of Technology, Sweden, Trafikplanering—Arkitektur, Fack, S-402 20 Goeteborg 5, Sweden

### 32 382819

#### PUBLIC TRANSPORT CO-ORDINATION IN SHIRE COUNTIES-THE EAST SUSSEX APPROACH

A description is given of the attempts being made in East Sussex to improve public transport by means of two practical projects: shuttle in the urban area of Brighton & Hove, demonstrating the development of the "Tram-Track" or trunk network; and Escort in the rural Lewes and Wealden districts, demonstrating the cost effectiveness of properly coordinated complementary services. Shuttle was designed after extensive market analysis to concentrate on two residential areas for an experimental two year period. The services operate with a 10 minute frequency and give an improved service to 75-80% of existing bus passengers. The scheme is a specific attempt to attract people travelling by car to town centre destinations. A flat fare system was rejected, but a major effort was made to develop off-bus sales. Passengers are encouraged to buy a discount card and then pay half fare or less. By this method the perceived marginal cost of travel is reduced. The shuttle is said to be operating more reliably and carrying more passengers than previous services. The Escort project uses a brokerage service (developed in conjunction with TRRL) which focuses the daily links between potential transport users (general public, Education Dept, Social Services Dept, Health Authority) and transport suppliers (local transport operators, contract hire services, community services, county council transport, voluntary transport and ambulance service). The broker receives written or telephone requests for transport and uses a computerised directory to locate appropriate transport already available to meet these requests. Information on requests not met is stored for future planning reference. The escort services (marketed as County Rider) should be seen as a system to suit the needs of a particular area complementing the trunk transport system. (TRRL)

Charnock, DB Robbins, J Brown, C (East Sussex County Council)  
*Traffic Engineering and Control* Vol. 24 No. 10, Oct. 1983, pp 471-476, 2 Fig., 3 Tab., 4 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 273170)  
ORDER FROM: ESL

### 32 382837

#### SHARED TAXI OPERATION: COST CONSIDERATIONS

This report gives the results of work carried out to investigate, in broad terms, when and where the use of shared taxi services might be justified in light of cost considerations. The costs of operating taxis have been estimated and compared with those of operating stage carriage buses. Comparisons have been made in financial, resource and fuel terms. The findings indicate that when public transport demands are low it may be more cost effective to provide a service with up to three shared taxis than with a bus. When demands are higher, and greater substitution ratios would be required to accommodate them, a bus represents the cheaper option. Similar relativities are noted in resource and fuel terms. Due to the nature of existing subsidy arrangements, break-even fares for a shared taxi could be expected to be somewhat higher than those charged on conventional stage carriage buses. Cost considerations applicable to the operation of shared hire car services are likely to be broadly the same. (Resource costs are costs that have had the effects of taxes and duties removed; they are a truer indication of the operating costs to society, as opposed to the financial operating costs to the service supplier.) (Author/TRRL)

Greening, PAK Jackson, RL  
Transport and Road Research Laboratory, (0305-1315) SR 793, 1983, 12p, 22 Fig., 5 Tab., 25 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273247)  
ORDER FROM: TRRL

### 32 382840

#### SOME NEW EVIDENCE RELATING TO QUANTITY CONTROL IN THE TAXI INDUSTRY

Quantity control of local taxi trades is the norm in England and Wales outside London, with the majority of district councils (the relevant licensing authorities) placing a limit on the number of vehicle licences that they are prepared to issue. In some districts the degree of restriction is severe and licences acquire extremely high market values. At the other end of the spectrum a number of districts find either lenient or no quantity control appropriate for local needs. By means of a series of pairwise comparisons of districts at both ends of this scale the reported work attempts to shed some light on the possible justification for quantity control. It is noted that quantity control does not noticeably improve the perceived quality of service, as measured by the volume of passenger complaints, and does not reduce fare levels. Further any benefits which it does confer are likely to be diluted by transfer of travellers to private hire cars which cannot be similarly subjected to quantity control. However, it does generally lead to the operation of higher value vehicles, may help to reduce the problem of rank over-crowding, and serves to protect the investment of those operators who have paid large sums to acquire a licence. It is acknowledged that the findings do not comprehensively resolve all the relevant issues. However, they do shed some new light on the question of quantity control, and some of their implications are discussed. (Author/TRRL)

Coe, GA Jackson, RL  
Transport and Road Research Laboratory, (0305-1315) SR 797, 1983, 21p, 7 Tab., 13 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273250)  
ORDER FROM: TRRL

### 32 384609

#### THE SHARED VEHICLE FLEET. A STUDY OF ITS IMPACT UPON ACCESSIBILITY AND VEHICLE OWNERSHIP

A shared fleet experiment in a medium-sized community provided each participating household with a small vehicle and the opportunity to call on larger vehicles when required. Gains in accessibility accrued chiefly to small lower-income households. There was a decrease of 25 percent in total vehicle ownership. (TRRL)

McCarthy, PS (Purdue University) *Journal of Transport Economics and Policy* Vol. 18 No. 1, Jan. 1984, pp 75-94, 14 Tab., 18 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 274910)  
ORDER FROM: Bath University, England, Claverton Down, Bath BA2 7AY, England

### 32 384613

#### TAXICAB OPERATING CHARACTERISTICS IN THE UNITED STATES

In 1982, a national survey of US taxicab operators was conducted. This survey sought to assess the economic, operational and organizational status of the industry and to determine how these characteristics have been changing in response to rising costs and an economic recession. Two results of this survey are reported in this paper; the size structure and the organization of the industry. Both of these characteristics show that it has recently been undergoing two fundamental changes. These are the rapid switch away from employees as drivers to independent contractor drivers and decreasing average company size. (Author/TRRL)

Gilbert, G Burby, RJ Feibel, CE (North Carolina University)  
*Transportation (Netherlands)* Vol. 12 No. 2, Jan. 1984, pp 173-182, 5 Tab., 1 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 274929)  
ORDER FROM: Elsevier Scientific Publishing Company, P.O. Box 211, 1000 AE Amsterdam, Netherlands

### 32 384614

#### CAR SHARING. A MODEL FOR INTEGRATION OF CARS INTO PUBLIC TRANSPORT [SAMAAKERI. DELRAPPORT. MODELL FOER INTEGRERING AV PRIVATBILAR I KOLLEKTIVTRAFIKEN]

Several attempts have been made in the past to encourage drivers to share cars, but the interest shown has been very little, mainly because of a lack of incentive. A new approach is being tried in gothenburg on the following



lines: (1) traffic company signs agreement with the driver whereby he undertakes to provide transport each working day. (2) the driver is paid monthly for the mileage done. (3) both driver and passengers buy a monthly season ticket for the trip. (4) only people who save at least 1-1/2 hours daily in relation to public transport qualify. (5) there must be at least 2 passengers. Estimates show that low income groups gain most by sharing a car. The cost to public transport users is the same, but they gain in convenience. A pilot group at Chalmers University of Technology took part in the test. It was found that (1) cars can be integrated into public transport, (2) the proposed payment system is advantageous, (3) a car should drive along a certain route rather than point-to-point, (4) the housing area is a good starting point for this scheme. A larger pilot project will start in the autumn of 1983 for one year. (TRRL) [Swedish]

Kollektivtrafikberedningen KTB Rapport 1983:11, 1983, 18p, 3 Fig., 4 Tab., Apps.

ACKNOWLEDGMENT: TRRL (IRRD 274406), National Swedish Road & Traffic Research Institute

ORDER FROM: Kollektivtrafikberedningen, P.O. Box 1339, Solna, Sweden

32 384662

**COMPUTER ASSISTED ROUTING, SCHEDULING, DISPATCHING AND MANAGEMENT INFORMATION SYSTEM (CARSD/MIS) PROJECT**

Volume 1 of the CARSD/MIS Systems Analysis Report describes paratransit operations in Dade County, Florida. The aim of the study was to determine the specific requirements for developing and implementing a CARSD/MIS in a large urban area. All social service agencies, including some private operators were contacted. The end product is a description of the system from the perspective of requirements for operation. Volume 2 of the CARSD/MIS Systems Analysis Report describes paratransit operations in geographic areas outside of Dade County, Florida.

Metropolitan Dade County, Transmax, Incorporated, Urban Mass Transportation Administration FL-06-0018, July 1981, 116p, Figs., 1 App.

ORDER FROM: NTIS

33 380148

**A COMPREHENSIVE TRANSPORTATION STUDY OF THE PUEBLO DE ACOMA**

The Acoma reservation, approximately 65 miles west of Albuquerque, N.M., has scheduled intercity bus service on Interstate 40 across its northern edge and a group of vans and buses purchased by the Tribal Council for various community programs. There are school, community health, emergency medical, social service and senior citizen transport operations. The 250 miles of primary and secondary routes within the Acoma reservation vary from the Interstate to secondary roads often affected by terrain and climate so that work sites, service center and residential communities are sometimes isolated. Purchase of a public transit van for commuting workers was found to be a deficit operation. Next an investigation was made of combining worker transportation to and from Albuquerque with regular tourist service from that city. This would enhance tourism on the reservation, but would not be financially viable. A shorter tourist van operation from nearby Grants, N. M., was also studied. It was concluded that the Pueblo of Acoma will continue to depend on the automobile; as autos and their fuel become more expensive there will be increasing demand for more public transportation.

Prepared in cooperation with the Middle Rio Grande Council of Government of New Mexico and the Urban Mass Transportation Administration.

Pueblo de Acoma Tribal Council, Tribal Planning Office July 1983, 51p

ORDER FROM: Pueblo de Acoma Tribal Council, Pueblo of Acoma, New Mexico, 87034

33 380247

**NEED TO OFFER A BETTER QUALITY PRODUCT AT MORE COST-EFFECTIVE PRICES: A NEW DESIGN FOR LOCAL PUBLIC PASSENGER TRANSPORT OUTSIDE THE HEAVILY-POPULATED AREAS (DIE NOTWENDIGKEIT EINES BESSEREN UND WIRTSCHAFTLICHEREN GESAMTANGEBOTS: NEUORDNUNG DES OPNV AUSSERHALB DER VERDICHTUNGSRÄUME)**

The author analyses the effects of the increase in private car ownership and the building and improvement of new roads on the long-term demand for local public passenger transport. He maintains that qualitative improvements to public transport systems based on new technology will not be enough in themselves to guarantee favourable developments. He advocates ways of putting into practice a more effective system of production at the lowest possible cost for local public passenger transport outside the heavily-populated areas. [German]

Schnell, P Die *Bundesbahn* Apr. 1983, pp 219-222, 4 Phot., 8 Ref.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration

ORDER FROM: Hestra-Verlag, Holzhofallee 33, Postfach 4244, 6100 Darmstadt 1, West Germany

33 380787

**TRANSIT MODEL FOR POPE, CONWAY, YELL, PERRY, JOHNSON, AND LOGAN COUNTIES (WEST CENTRAL ARKANSAS). FINAL REPORT**

The study area consists of six rural counties in west central Arkansas. Arkansans have the highest usage of gasoline per registered vehicle in the U.S. and little public demand for transit service. Private industry and public agencies worked together on developing a viable transit model for the 6-county area which is undergoing a transition from an agrarian to an industrial economy. Feasible plans include the starting of a small transit system based in Russellville which would concentrate on work trip and school commuting with fixed-route operation in the Russellville/Dardanelle area in mid-day. Consolidation and brokerage of existing human-service agency transportation services and an umbrella agency to assist interested entities with vanpooling would also be introduced. As potential alternatives, it was recommended that existing human-service agency transportation be consolidated under one agency or that industry vanpools be established by interested private agencies.

Transit Management and Consulting Company, Inc UMTA-AR-09-8008, Dec. 1982, 150p, Figs., 1 App.

ORDER FROM: Transit Management and Consulting Company, Inc, P.O. Box 24006, Fort Worth, Texas, 76112

33 380896

**PARK-AND-RIDE FROM LELANT SALTINGS**

A description is given of the park & ride scheme that has been in operation in the Cornwall tourist resort of St Ives since 1978. In the mid-1970s the resort with its attractive narrow streets was severely congested with traffic. A park & ride scheme was evolved based on an area of waste land at Lelant Saltings some 5 miles from St Ives. The enterprise was a joint effort by the local district council, the county council and British Rail. There is a flat charge for parking a car with day-return tickets for up to seven occupants. When the scheme began in 1978 it met with immediate success. 31,000 cars were parked in the 300-space car park in the first season. (this approximates to 180,000 passengers carried). Though the numbers using the scheme have declined in recent years—due mainly to the recession which has hit the West Country holiday trade badly—in 1982 some 64,000 park & ride passengers were carried. The popularity of the scheme has undoubtedly been helped by the attractiveness of the coastal railway trip involved and Cornwall County Council is thought to be interested in trying the scheme at other similarly placed resorts. (TRRL)

Abbot, J *Modern Railways* Vol. 40 No. 420, Sept. 1983, pp 475-477, 7 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 271636)

ORDER FROM: Allan (Ian) Limited, Terminal House, Shepperton TW17 8AS, Middlesex, England

33 381453

**MATLOCK BATH-A CASE FOR PARK AND RIDE?**

Matlock Bath, a quiet Derbyshire village where the A6 Passes through Matlock Dale, is seriously affected by traffic congestion at weekends and on bank holidays. It is suggested that the Derby to Matlock branch railway line running parallel along the dale might be used to help ease this congestion in two ways. Firstly, by running excursions from East Midland towns at fares to attract car drivers and their families and, secondly, by the establishment of a park and ride train service. The latter would be from the nearby towns of Matlock and Cromford where parking space is available and where a shuttle service could be easily fitted in between the scheduled services. A further suggestion is made that the service could be operated by the Peak Railway Society, thus providing the additional attraction of a steam railway trip.

Baker, CJ (Nottingham University, England) *Modern Railways* Vol. 40 No. 419, Aug. 1983, pp 428-429, 1 Fig., 1 Tab., 3 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 272830)

ORDER FROM: Allan (Ian) Limited, Terminal House, Shepperton TW17 8AS, Middlesex, England

33 381557

**OPERATION PUBLIC TRANSPORT IN CARRICK: REPORT OF PHASE 3—THE ATTITUDE SURVEY**

Opinions were sought from 199 respondents of phase 2 of the OPTIC (Operation Public Transport in Carrick) survey living in the predominantly rural area of Carrick (population 18,000) in South Ayrshire, Scotland about various aspects of local bus services. All were from households with little or no access to a car, and were in one of three groups: young people aged 12-24, housewives not in paid employment, and the elderly. All lived in the smaller settlements in the area. The purpose of the study was to provide a subjective element in the OPTIC survey. Bus services catered better for shopping and other daytime activities than for those outside normal working hours. The social and recreational transport needs of young people were not well served. Nevertheless, a high degree of satisfaction amongst respondents was evident, especially those in rural areas with relatively sparse services. It was felt that improvements might be made by better bus-bus and bus-rail service co-ordination and by the concentration of rural services on fewer days with better timing.

Benwell, M  
Cranfield Institute of Technology CRANFIELD-CTS-14, 1979, 64p

ORDER FROM: NTIS PB83-258053

33 381561

**ANALYSING THE EFFECTS OF RURAL BUS SERVICE REDUCTIONS IN LIFE STYLES**

The paper describes a study of the relationships between levels of bus service, mobility and social well-being in rural communities in the Netherlands. The study seeks to determine whether low levels of bus service may interfere with social-cultural development for some groups of people.

Clarke, M Van Knippenberg, C Splinter, J  
Oxford University, England TSU/REF-215/CP, July 1983, 15p

ORDER FROM: NTIS PB84-114727

33 381606

**THE USE OF RESEARCH FOR DEVELOPING NEW TRANSPORT POLICY IN RURAL AREAS IN THE NETHERLANDS**

At the 1981 summer annual meeting, the results and findings of a pilot study testing a methodology for the investigation of the relationship between social and cultural activities and the level of public transport services in rural areas were presented. Further work to study this relationship has been undertaken now. As a result of increased attention in the Netherlands on the role of public transport in the less densely populated areas, much consideration has been given to alternative means of studying the function of the public transport in these areas. This paper places the various studies which have been undertaken in the Netherlands in a broader policy context. The main focus is the problem of determining the minimal level of services of public transport whereby people living in rural areas can satisfy their basic transport needs. Therefore, it is necessary that public authorities should obtain information about these transport needs and the degree to which they are satisfied. In this context, the results of the various studies undertaken will be brought together. Conclusions will be directed towards the question of how research can contribute information in valuing the role of public transport in rural areas. Research can also serve as leverage points for developing new transport policy. (Author/TRRL)

Transport Policy. Proceedings of Seminar M held at the PTRC 11th Summer Annual Meeting, University of Sussex.

Hoekert, M Lameijer, I (Ministry of Transport & Public Works, Netherlands) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1983**, pp 159-167, 4 Tab., 2 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273094)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

33 382222

**PROCEEDINGS OF THE 1981 WORKSHOP ON RURAL TRANSPORTATION ON INDIAN RESERVATIONS. WITH BIBLIOGRAPHY**

This is a final report on the proceedings of the Workshop on Rural Transportation on Indian Reservations. The workshop was held on August 17, 1981 as an adjunct to the Fifth National Conference on Rural Public Transportation. The purpose of the workshop was to bring together representatives of Indian tribes and Government agencies with an interest in rural public transportation programs on Indian reservations. Its objectives were: 1) to solidify the knowledge gained through Section 147 and other Federal and state experiences; and 2) to plan for continuing the momentum of accomplishment into the future despite reduction of Federal support. The workshop was quite successful in pursuing these objectives. A program of presentations and case studies was followed by focus groups to discuss selected issues and a final summary session with reports from the focus groups and an open discussion. The report contains, as appendiced, two bibliographies or rural transportation reports and related references prepared by state and Federal agencies.

Crain, J

Crain and Associates, Incorporated, Urban Mass Transportation Administration, (DTS-64) Final Rpt. UMTA-MA-06-0049-83-5, DOT-TSC-UMTA-83-48, Nov. 1983, 66p, 1 Fig., 3 App. Contract DOT-TSC-1755

ORDER FROM: NTIS

33 382243

**CONSOLIDATION PLAN FOR EXISTING TRANSPORTATION PROVIDERS IN THE McALLEN PHARR-EDINBURG-MISSION-SAN JUAN AND HIDALGO URBANIZED AREA**

With reduction in rural-area transportation funding by federal and state government, the Lower Rio Grande Valley Development Council (LRGVDC) undertook a study of consolidation and coordination of such services in a portion of its South Texas area which has a total population of a half million, 80% of which are Hispanic and 14% of which receive public assistance. The Consolidation Plan analyzed all current transportation providers within the McAllen-Pharr-Edinburg Urban Area which has a population of about 150,000. Providers include social-service agencies, school districts, intercity bus lines, and taxicab companies. A workshop discussed possible coordination among agencies after each group's program and transport needs were identified. Alternative methods of financing a social-service information and referral system on transportation services by each group was studied. LRGVDC would then administer coordination of all Section 18 funding in the area. Organizations were skeptical about coordinating or consolidating their services and concerned about losing administration of their programs. Cooperation was won because Section 18 finances 80% of all capital and administrative expenses and 50% of operating expenses for a combined program.

Lower Rio Grande Valley Development Council July 1983, 94p

ORDER FROM: Lower Rio Grande Valley Development Council, Transportation Services Department, McAllen, Texas, 78501

33 382599

**ACCOUNTING AND REPORTING PRACTICES FOR TRANSPORTATION: AN ANALYSIS IN SIX STATES. VOLUME 1**

The report provides the detailed findings of six states in the Transportation Accounting Consortium, identifying accounting problems experienced by small and rural transportation providers and the various state agencies administering transportation program funds. The states surveyed include Arkansas, Iowa, Massachusetts, Michigan, North Carolina, and South Carolina. Attitudinal and factual surveys were completed on problems associated with the lack of uniform accounting, billing, auditing and program reporting. In general, many of the reported problems were closely tied to the multiplicity of federal funding sources and the resulting hinderances in developing coordinated transportation systems in a state.

Transportation Accounting Consortium, Carter-Goble Associates, Incorporated, Applied Resource Integration Limited, Department of Transportation, Department of Health and Human Services Final Rpt. DOT-I-82-31, Mar. 1982, 149p

ORDER FROM: NTIS PB84-127414

33 382721

**CHANGES IN THE STANDARD OF PUBLIC TRANSPORT BETWEEN 1960 AND 1980 IN TWO RURAL AREAS IN SWEDEN [HAR GLESBYGDENS KOLLEKTIVTRAFIKFOERSOERJNING FOERAENDRATS SEDAN 1950-TALET? EN STUDIE AV TRANSPORTUTBUDETS FOERAENDRING I MUNKEDALS OCH STROEMSTADS KOMMUNER 1950-1980]**

This is an attempt to evaluate, from the inhabitants' point of view, changes in the standard of public transport between 1960 and 1980 in two rural areas in Sweden. As a measure of public transport standard this study uses accessibility, defined as the possibility for an individual to take part in an activity depending on the location and the opening hours of the activity and the mobility of the individual. Available public transport services in 1960, 1970 and 1980 were related to the location of rural dwellings and to the location of certain activities (e.g. Schools, working places, post offices and shops) at the same moments in time. Various kinds of demands were applied to the public transport system and the resultant effects were calculated in terms of the number of people involved. From 1960 to 1980 the location of most of the activities referred to in this study has changed to a great extent. The points of destination are considerably fewer and mostly located in urban areas. In the 60's not only the activities but also the people concentrated in urban areas, but in the 70's many persons moved back to rural areas, now mostly to places along the main roads. In 1960 the public transport system in the areas studied consisted only of regular route services. This kind of public transport has been severely diminished during

the period of time studied, both as regards the number of kilometres covered and the frequency of the services. During the 70's, however, other kinds of public transport systems initiated by and mostly paid for by the government, have come into operation. Those benefiting from these new services are mostly special groups of people, such as school children, people who are ill or handicapped and elderly people, but there is also a public transport network specially designed for shopping trips. With all different kinds of public transport services taken into account it is shown, with the method used, that both coverage and accessibility are the same or slightly better in 1980 than in 1960. The standard of transport, defined as accessibility, is of course inferior for some people in the most remote places, especially when the frequency is taken into account, but, if inhabitants are taken as a whole, the standard of public transport services has improved in some respects and especially for some groups of people. (Author/TRRL) [Swedish]

Kihlman, B (Gothenburg University, Sweden) **VTI RAPP VTI** Rapport 264, 1983, 42p, 7 Fig., 8 Tab., Refs.

ACKNOWLEDGMENT: National Swedish Road & Traffic Research Institute (IRRD 273690), National Swedish Road & Traffic Research Institute

ORDER FROM: National Swedish Road & Traffic Research Institute, Fack, S-581 01 Linköping, Sweden

33 382784

#### THE EAST SUSSEX RURAL TRANSPORT DEMONSTRATION PROJECT

This paper deals with the rural transport demonstration project—a joint East Sussex County Council/Department of Transport exercise. The rural transport problem has been well researched. Much effort has been centred on “needs” and the demand for travel. Equal, if not more, research effort has been devoted to transport modes—community buses, lift schemes, shared taxis, post buses etc. Up to now the approach has been problem-orientated, lacking the comprehensiveness of overall planning. In this county we had the Lewes Area Public Transport Study, a collaborative research exercise undertaken jointly by the Department of Transport and East Sussex County Council. We have now identified the way towards a solution to the rural transport problem as the co-ordination of Tertiary transport and its integration with the secondary services to supplement the primary network. This county has introduced Escort East Sussex Co-ordinated Rural Transport, a project designed to test the operational problems, financial benefits and improvements to the level of service resulting from the introduction of a “brokerage” system to co-ordinate the total Tertiary transport system and its users. This paper will explain the “brokerage” concept, and report on other developments of the project including multi-purpose transport services, local volunteer transport co-ordination and mini pools. (Author/TRRL)

Public Transport Planning and Operation. Proceedings of Seminar L held at the PTRC 11th Summer Annual Meeting.

Brown, C (East Sussex County Council) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc** 1983, pp 5-13, 2 Fig., 3 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 273495)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

33 382785

#### DEFENDING PUBLIC TRANSPORT OR WHY AND HOW TO PROTECT A SYSTEM AND ITS USERS

Rural public transport is declining gradually in sparsely populated parts of the Netherlands. This is due in part to a steady depopulation of small villages but decline is self-sustaining and confirmed by the national standards for level of service (nvs) based on mean ridership levels. In 1981 an application of somewhat stricter standards (for reasons of economy) caused considerable decreases of the level of service in some areas. A before and after study was undertaken by the first author on about 40 buslines. It was subsidized by two provinces—worried about livability of the countryside—and carried out in cooperation with the regional bus operators—worried about their prospects. Two-thirds of the passengers experienced problems especially those on weak lines with a sharply decreased level of service were severely affected. Regarding the apparent value of rural transport for its users we set out to develop a transport system integrating conventional public transport with specialist and community transport. Its purpose was threefold: to increase the general level of service without increasing deficits,

to serve the needs of different user-categories as indicated by the study mentioned, and to protect conventional public transport. This might be attained by dropping traditional geographic (and legal) boundaries between different systems and by utilizing different components dependent on changes in volume and character of demand during the day and the week. The second author surveyed transport provisions in an area of approximately 160 sq km and designed a new network. (Author/TRRL)

Public Transport Planning and Operation. Proceedings of Seminar L held at the PTRC 11th Summer Annual Meeting.

Deown, C Klinkenberg, J (Delft University of Technology, Netherlands) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc** 1983, pp 21-30, 1 Fig., 3 Tab., 11 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273496)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

33 382786

#### RATS (ROMSEY AREA TRANSPORT STUDY): AN IN DEPTH STUDY OF PUBLIC TRANSPORT ISSUES IN A MARKET TOWN

During 1983 the National Bus Company and Hampshire County Council undertook a joint exercise in the Romsey area with the following objectives:—(1) to determine the existing and frustrated transport needs by means of both household and on-vehicle passenger surveys; (2) to identify the commercial bus network, if any, which could be sustained on passenger fares alone; and (3) to assess the most efficient and cost-effective means of meeting social needs using both conventional and unconventional transport resources. The study reached the following conclusions:—(1) reducing fares is not a viable proposition. A commercial bus service was identified on the Romsey-Southampton corridor although this would only cater for 36% of existing demand in the study area and result in widespread social hardship; (2) school transport movements were of critical importance. The need to provide conventional buses for school transport enables these resources to be used at marginal cost to meet inter peak social needs. Effective co-ordination of all transport resources can result in substantial financial savings. The cost of the county council's revenue support and school transport commitment in the study area could be reduced by more than 20% with 94% of demand being met by operation of the commercial service and the combination of school contracts and stage carriage bus services. Staggering of school hours could increase the savings to 30%; (3) the remaining unserved demand (6%) would be relatively costly to provide for by conventional means but unconventional solutions could possibly be co-ordinated to provide certain facilities; and (4) there was considerable scope for improving the bus operator's image, particularly in terms of value for money. (Author/TRRL)

Public Transport Planning and Operation. Proceedings of Seminar L held at the PTRC 11th Summer Annual Meeting.

Beaman, D (National Bus Company); Jones, D (Hampshire County Council) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc** 1983, pp 31-41, 2 Fig., 5 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 273497)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

33 382885

#### THE PUBLIC TRANSPORT SERVICE LEVEL, THE VIEW OF THE SOCIETY [HET BEDIENINGSNIVEAU OPENBAAR VERVOER BEZIEN VANUIT MAATSCHAPPELIJK OOGPUNT]

This paper is an extract taken from the “Provincial Traffic and Transportation Plan” of the Province of Friesland. The central theme is the judgment of the regional public transport in low density areas with many small communities. The system is based on the importance of public transport for society and not on actual usage. (TRRL) [Dutch]

Conference Papers of the Working Days on Traffic Engineering 1983.

Hofstra, PH (Hofstra Verkeersadviseurs Bv, Groningen); Defstra, PHN (Studiecentrum Verkeertechniek) **Bijdragen Verkeerskundige Werkdagen** 1983 Apr. 1983, pp 235-248, 6 Fig., 1 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 272697), Institute for Road Safety Research SWOV

ORDER FROM: Werkdagcommissie, P.O. Box 163, Driebergen-rijnsbur, Netherlands

33 384595

**PUBLIC TRANSPORT IN THE REGION OF NORTH NORWAY [KOLLEKTIVTRANSPORT I EN LANDSDEL: NORD-NORGE]**

The transport conditions in the region of northern Norway are different from those in the more central areas of the country. The availability of public transport is limited, and the distances between the local communities are much larger here than in the rest of the country, which makes it both expensive and time consuming to travel in the region. This report mainly deals with conditions concerning occupation and journeys to work, but also shopping travel and journeys to family and friends are dealt with, as well as the general travelling pattern in north Norway. The aim is to present the main tendencies in the material resulting from a nation-wide interview investigation performed in 1980. (TRRL) [Norwegian]

Houg, T Gundersen, H *Transport og Velferd* No. 12, 1982, 12p, 3 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 274473), Norwegian State Highway Laboratory  
ORDER FROM: Institutt for Samfunnsforskning, Munthesgt 31, N- Oslo 2, Norway

33 384600

**RURAL PUBLIC TRANSPORT IN KENT. A METHOD OF IDENTIFYING NEED**

This report describes a study carried out by Kent County Council in conjunction with Brighton Polytechnic to develop a method of assessing the need for public transport as an aid to planning new services and the allocation of resources. The aims and methods of the study are elaborated and the household surveys (work journeys, shopping/personal business journeys, medical journeys) undertaken to provide the basic data for the study are described. Details are presented of the main findings on the modes of transport used for the journeys. A needs matrix and a demand matrix are derived, and their method of application are described in detail. The method can be used at three levels: policy and objective formulation, modelling of service changes, and rationalisation of services. An example is given of the use of the method. (TRRL)

Kent County Council Monograph July 1983, 48p, Figs., Tabs.

ACKNOWLEDGMENT: TRRL (IRRD 274517)  
ORDER FROM: Kent County Council, Highways and Transportation Department, Maidstone, Kent, England

33 384617

**HOW TO IMPROVE PUBLIC TRANSPORT IN SPARSELY POPULATED AREAS. SEMINAR HELD AT THE SWEDISH ROAD AND TRAFFIC RESEARCH INSTITUTE 17TH MAY, 1983 [HUR SKALL GLESBYGDENS KOLLEKTIVTRAFIKFOERSOERJNING FOERBAETTRAS? RAPPORTSAMMANSTAELLNING FRAAN ETT SEMINARIUM VID VTI 1983-05-17]**

Papers presented at the seminar were as follows: Change of the Public Transport Service in Rural Areas after 1950 (Kihlman, B); Can the Public Transport in Rural Areas be improved (Norrbon, C-E); Public Transport in Rural Areas in Norway (Froeyssadal, E); Implementation of Public Transport in Accordance To Transport Needs (Altin, S-O); Paratransit Innovations in Service Design and Technology (Britton, F); Rural Mini-bus Transport Service (Gunnarsson, O); What Can Swedish County Traffic Authorities Do To Improve the Public Transport Service (Jonsson, A). (TRRL) [Swedish]

Kihlman, B (Gothenburg University, Sweden); Norrbom, C-E (Transportraadet); Froeyssadal, E (Norwegian Institute of Transport Economics); Altin, S-O (Ab Dalatrafik); Britton, F (Ecoplan International, France); Gunnarsson, O (Derry and Sons, Limited); Jonsson, A (Laenstrafiken I Vaesterbotten Ab)  
National Swedish Road & Traffic Research Institute, (0347-6030) VTI Rapport 266, 1983, 108p, 18 Fig., 8 Tab., 4 Phot., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 274420), National Swedish Road & Traffic Research Institute  
ORDER FROM: National Swedish Road & Traffic Research Institute, Fack, S-581 01 Linkoeping, Sweden

33 384621

**STATE MECHANISMS FOR IMPROVING CASH FLOW TO TRANSPORTATION PROVIDERS**

Cash flow problems experienced by smaller and rural public transportation providers are often tied to operating assistance subsidies. Many small and rural transportation operations are often supported by state operating funds and human service purchase contracts. For the transportation operator, there is often an unavoidable delay in the time it is reimbursed. The problem is often multiplied by the number of funding sources. Cash flow problems are surmountable. Of the six Consortium states, five have taken steps to alleviate cash flow problems. The mechanisms adopted by the states of Arkansas, Iowa, Massachusetts, Michigan, and South Carolina are presented in summary and detail as models. In these states, the solutions include advance payment of State operating assistance, bonding authority, and a revolving loan fund.

Malkowski, K Bergeron, T  
Transportation Accounting Consortium TAC-83-3, Nov. 1983, 30p

ORDER FROM: NTIS PB84-134436

33 384625

**STATE IMPLEMENTATION OF THE SINGLE AUDIT FOR HUMAN SERVICE AND RURAL TRANSIT SYSTEMS**

This report describes the experience of the states in the Transportation Accounting Consortium, and their implementation of the single audit. The preliminary experiences of three Consortium states, Michigan, North Carolina, and Iowa are described. The single audit is viewed as one component of developing standardized state transportation accounting procedures based on a uniform chart of accounts. The Consortium found that implementation of the single audit in conjunction with a uniform transportation chart of accounts can simplify audit procedures, reduce the amount of effort to conduct the audits, and reduce the number of uncoordinated audits sponsored by different governmental funding agents.

Malkowski, K Bergeron, T  
Transportation Accounting Consortium TAC-83-6, Nov. 1983, 10p

ORDER FROM: NTIS PB84-138197

33 384900

**STATE TECHNICAL ASSISTANCE PROGRAMS AND MANUALS ON RURAL PUBLIC TRANSPORTATION**

This 44-page report describes the technical assistance activities of some 40 states dealing with rural public transportation. The document provides one-line status and contact data for state management programs, studies, and manuals; audio-visual programs; Section 18 management plan.

The document is an original print issued in June 1979.

Short, J Griffin, H  
Iowa Department of Transportation, California Department of Transportation, Office of the Secretary of Transportation June 1979, 47p

ORDER FROM: NTIS PB84-143676

33 384907

**STATE IMPLEMENTATION OF TRANSPORTATION, BILLING FOR HUMAN SERVICE AND RURAL TRANSIT SYSTEMS**

This report deals with the state role in selecting and implementing uniform billing for human service and rural transit systems. Uniform billing concerns flow from the recognition of problems dealing with rate setting, invoicing, and cost allocation. Based on the experience of six states, resolving billing problems are highly related to the state adopting a uniform transportation bookkeeping system provides structure to the financial and operating reports for such systems. Models of billing approaches in the states of Iowa, Massachusetts, Michigan, North Carolina and South Carolina, members of the Transportation Accounting Consortium, demonstrate how these states are standardizing transportation billing for small and rural transit systems. The degree of standardization results from decisions of state human service and transportation departments on their respective roles.

Malkowski, K Bergeron, T  
Transportation Accounting Consortium, Department of Transportation, Department of Health and Human Services Final Rpt. TAC-83-5, Nov. 1983, 17p

ORDER FROM: NTIS PB84-135599

33 384908

**TRANSPORT IMPROVEMENTS AND RURAL OUTMIGRATION  
IN COLOMBIA**

This paper explores the hypothesis that transport improvements increase rural employment in developing nations by raising farm incomes and making amenities more accessible in the countryside. Using an econometric model applied to Colombian data, the effects are measured by examining the interrelationships among bus service, location, family income and rural outmigration. Most planners believe that migration is inversely related to travel time so that transportation improvements in rural areas accelerate outmigration by reducing the costs of moving to cities. In this study several other ways, besides changes in moving costs, are examined in which distance could affect rural outmigration. First, the distance effects on access

to urban amenities are taken into account. The relationships between migration flows and regional incomes are then considered. Another special feature is the base used to measure migration rate in the sending region rather than the region receiving the flow. Some support is found for the hypothesis that migration increases with distance from cities in areas where bus service is infrequent. However the results do not conclusively show whether transportation improvements will reduce rural outmigration.

Udall, AT (Governor's Economic Council of Puerto Rico) **Economic Development and Cultural Change** Vol. 29 No. 3, Apr. 1981, pp 613-629, 3 Tab., 1 App.

ORDER FROM: Chicago University Press, 5801 Ellis Avenue,  
Chicago, Illinois, 60637

34 380123

**TRANSPORTATION IN CANADA: A GUIDE FOR TRAVELLERS WITH SPECIAL NEEDS**

This guide informs the traveling public of special transportation services available, and the facilities, policies and procedures of airlines, railways, ferry operators and bus companies with respect to the traveler with special needs. "Traveler with special needs" embraces the young, elderly, invalid, temporarily disabled, and other persons with limited ability as well as the wheelchair-bound and persons with permanent physical or perceptual impairments. There is data on many urban paratransit services across Canada. Schematics of transportation terminals in major cities are included, along with the names and addresses of local, provincial and national information centers.

Copies of this guide may also be obtained from information booths at airports, train stations and major bus terminals across Canada, local associations, and travel agencies for disabled persons.

Transport Canada TP 380, Dec. 1981, v.p.

ORDER FROM: Transport Canada, 1000 Sherbrooke Street, West, P.O. Box 549, Montreal, Quebec H3A 2R3, Canada

34 380166

**URBAN TRANSPORTATION SERVICES FOR PHYSICALLY DISABLED PERSONS IN CANADA. INFORMATION DIRECTORY**

This directory serves as a guide for disabled consumers traveling in Canada and also is of some benefit to those considering implementation of a transportation system in their community. It is based on a questionnaire sent to over 250 services across Canada. Along with being a resource for the handicapped, the information is also intended to encourage the exchange of service and operating information among operators of transit systems and transportation services, to identify variations in operating characteristics of transportation services for handicapped people including funding and implementation, to report on the varying provincial, municipal and federal government jurisdictions in regard to funding the transportation handicapped, and to report on safety procedures and vehicles for transportation of the handicapped.

Canadian Rehabilitation Council for the Disabled Dec. 1981, 157p, 3 App.

ORDER FROM: Canadian Rehabilitation Council for the Disabled, Suite 2110, 1 Yonge Street, Toronto, Ontario M5E 1E5, Canada

34 380838

**"GETTING THERE"-SOME RECENT DEVELOPMENTS IN DOOR-TO-DOOR TRANSPORT FOR PEOPLE WITH DISABILITIES**

This pamphlet outlines the limitations of "special transport" services which fall into three basic categories, with all the vehicles operated being capable of carrying people in their wheelchair: (1) dial-a-ride services using vehicles carrying more than one person at a time, with each person's origin and destination being different; (2) dial-a-ride services using vehicles carrying one person at a time, operating like a taxi service; (3) services using vehicles carrying more than one person at a time, with each person's origin being either the same or different, but with their destination being the same, eg a shopping centre. Door to door services in the United Kingdom are reviewed together with some of the services operating in Europe. All vehicles currently in operation, except for the new telebus, are adapted or converted cars and vans. Examples are shown, and a list of coachbuilders is included, together with addresses for wheelchair restraint fittings, harnesses, chair-lifts and wheelchair taxis. (TRRL)

Lightfoot, G  
Action on Disabled Persons Transport Monograph Apr. 1982, 24p, Figs., Photos., 5 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 270997)  
ORDER FROM: Action on Disabled Persons Transport, Spastics Society NW Region, 62 Bridge Street, Manchester, England

34 380851

**THE ELDERLY AND THE HANDICAPPED: TRANSPORTATION REQUIREMENTS TO 2000**

This paper examines future transportation requirements of Canada's growing handicapped population by dividing the population into three

groups, the elderly, the physically handicapped and the perception and communication-handicapped. The specific transportation needs of each group are considered and transportation solutions for major travel modes are discussed. Canadian and American accessibility goals are contrasted. It is concluded that: (a) future transportation needs of the elderly and handicapped will be met by properly applying current-day technology and systems; (b) research and development efforts as well as special programs costs will increase in order to meet the needs of the E&H; and (c) the needs of the elderly, and the perceptually and cognitively-impaired are shown to be relative unknowns, and therefore should be the targets of R&D. This document will be of special interest to urban and transportation planners. (Author/TRRL)

Proceedings of the 18th Annual Meeting of the Canadian Transportation Research Forum, Regina, Saskatchewan, June 1983.

Suen, L Huneault, DA (Transport Canada Transportation Development Centre)  
Saskatchewan University Printing Services Proceeding June 1983, 22p, 1 Fig., 5 Tab., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 270856), Roads and Transportation Association of Canada  
ORDER FROM: Saskatchewan University Printing Services, Saskatoon, Saskatchewan, Canada

34 380878

**CHRONICALLY SICK AND DISABLED PERSONS ACT 1970. RESEARCH AND DEVELOPMENT WORK ON EQUIPMENT FOR THE DISABLED 1982**

This report, the thirteenth report published pursuant to Section 22 of the Chronically Sick and Disabled Persons Act 1970, deals, among other topics, with personal transport: mention is made of the future code of practice for the manufacture, testing and supply of car control conversion equipment, development of hand controls for cars, survey of the mobility of the disabled, electrically powered wheelchairs, chargers, batteries and controllers, wheelchairs and their components. Activities carried on under the auspices of the Department of Transport are listed: Research on pavement surfaces for easy location of pedestrian crossings by blind people, publication of "door-to-door-a guide to transport for disabled people", design of buses, taxis, cars, electric bicycles, wheelchairs and wheelchair occupant restraint systems, audible device for pelican crossings, inductive coupler earpiece, and talking bus stop device. (TRRL)

Her Majesty's Stationery Office Monograph No. 77, July 1983, 27p

ACKNOWLEDGMENT: TRRL (IRRD 271571)  
ORDER FROM: Her Majesty's Stationery Office, 49 High Holborn, London WC1V 6HB, England

34 380880

**THE USE OF BUSES IN SHEFFIELD BY ELDERLY AND HANDICAPPED PEOPLE**

A study has been made of the use by disabled and elderly people of buses with lower than normal entry steps ("split step" entrance) and of buses that can be knelt to ease access. Elderly and disabled passengers used the lower step of the split step entrances preferentially and considered that type of bus easier to use. The split step entrance did not involve the operator in any significant extra capital or maintenance costs, and did not affect boarding times. The kneeling buses were only occasionally knelt in service. Passengers with physical problems cited steps as a source of difficulty far more often than did other passengers. Despite this, moving about within the bus is cited as the greatest cause of difficulty by all passengers, both with and without physical problems. (Author/TRRL)

Oxley, PR Benwell, M (Cranfield Institute of Technology)  
Transport and Road Research Laboratory, (0305-1315) SR 779, 1983, 42p, 6 Fig., 18 Tab., 8 Phot., 11 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 271619)  
ORDER FROM: TRRL

34 381034

**A STUDY OF WHEELCHAIR-BUS OPERATIONS IN A SUBURBAN ENVIRONMENT: AN IDENTIFICATION OF FACTORS INHIBITING USAGE AND ESTIMATES OF IMPACTS. EXECUTIVE SUMMARY**

This report covers the results of a two-year study which dealt with an analysis of travel barriers confronting the wheelchair-handicapped in getting to and from bus stops served by lift-equipped buses in a suburban county and an investigation of the service impacts of wheelchair passengers' demand on a bus route's travel time, schedule, and service reliability in a suburban county. The study is based on data collected in Westchester County, New York. The travel barrier analysis was undertaken through interviews with a sample of wheelchair users and the service impact analysis was carried out using a bus route simulation model which was developed as part of this research. The documentation of the simulation model is detailed in Appendix 3 of the full report. The sample survey showed that approximately 80% of those interviewed do not travel by bus because better alternatives are available. Although most of the respondents would experience severe difficulties traveling alone due to the presence of barriers, about 50% of the sample would still need assistance in getting to the bus even if travel barriers were removed. Schedule, route travel time, and service reliability impacts were found to be small for "average" wheelchair ridership demand.

Falcocchio, JC Adesanya, M McShane, WR  
Polytechnic Institute of New York, Urban Mass Transportation  
Administration Final Rpt. UMTA-NY-11-0023-83-1, Dec. 1982,  
21p Contract NY-11-0023  
ORDER FROM: NTIS PB83-252015

34 381035

**A STUDY OF WHEELCHAIR-BUS OPERATIONS IN A SUBURBAN ENVIRONMENT: AN IDENTIFICATION OF FACTORS INHIBITING USAGE AND ESTIMATES OF IMPACTS**

This report covers the results of a two-year study which dealt with an analysis of travel barriers confronting the wheelchair-handicapped in getting to and from bus stops served by lift-equipped buses in a suburban county and an investigation of the service impacts of wheelchair passengers' demand on a bus route's travel time, schedule, and service reliability in a suburban county. The study is based on data collected in Westchester County, New York. The travel barrier analysis was undertaken through interviews with a sample of wheelchair users and the service impact analysis was carried out using a bus route simulation model which was developed as part of this research. The documentation of the simulation model is detailed in Appendix 3 of the full report. The sample survey showed that approximately 80% of those interviewed do not travel by bus because better alternatives are available. Although most of the respondents would experience severe difficulties traveling alone due to the presence of barriers, about 50% of the sample would still need assistance in getting to the bus even if travel barriers were removed. Schedule, route travel time, and service reliability impacts were found to be small for "average" wheelchair ridership demand.

Falcocchio, JC Adesanya, M McShane, WR  
Polytechnic Institute of New York, Urban Mass Transportation  
Administration Final Rpt. UMTA-NY-11-0023-83-2, Dec. 1982,  
83p Contract NY-11-0023  
ORDER FROM: NTIS PB83-252031

34 381038

**ANALYSIS OF ISSUES IN THE CONSOLIDATION OF ELDERLY AND HANDICAPPED TRANSPORTATION SERVICES**

Consolidation of special transportation for the elderly and handicapped (E&H) has been advanced as a means for reducing costs, while maintaining service and improving efficiency. Consolidation involves the integration of one or more management functions of two or more agencies that administer or operate special transportation services for the E&H community. This study reviews several institutional barriers expressed in literature, as well as those developed from discussions with regional, county, and city officials involved in the administration or provision of transportation services to the E&H. Interviews were conducted in the Washington D.C. metropolitan area, Pennsylvania, Massachusetts, Florida, Missouri, New Orleans, Texas, and California. This report presents some of the management consolidation

experiences of agencies within these jurisdictions as well as suggestions to minimize resistance to consolidation. This report concludes that the institutional restraints to consolidating E&H transportation are minimal and surmountable; that the principal restraint to consolidation is "turfism" (tendency of agencies to resist the relinquishment of autonomy required by consolidation); that higher levels of consolidation occur in states where consolidation is mandated by law; the literature review indicated several adverse concerns discouraging consolidation; and that multi-agency participation in the consolidation planning process be included. This report provides a list of bibliographic references.

Noel, EC Graye, ES  
Howard University, Howard University, Urban Mass Transportation  
Administration Final Rpt. UMTA-DC-11-0016-83-1, Aug. 1983, 50p

ORDER FROM: NTIS PB84-117118

34 381039

**QUALITY OF SERVICE IN SPECIAL TRANSPORTATION FOR THE ELDERLY AND HANDICAPPED. EXECUTIVE SUMMARY.**

Special transportation for the elderly and handicapped is provided by a number of different types and sizes of organizations. Examples of different types of providers include private, non-profit social service agencies that primarily provide service for their own clients, transit authorities that operate a demand-responsive service to meet Federal requirements, and taxi companies that have purchase of service agreements with municipalities. This report describes the third year of a three-year study of the effect of the size and type of organization on the service provided. In the first year, economies of scale in special transport was investigated; in the second year, the effect of coordination on provision of special transportation was studied; and in the third and final year, a methodology to measure quality of service in the provision of transportation for the elderly and handicapped was developed. The methodology was used to develop quantitative measures of service quality. These measures were then used to determine the effect of size and type of organization on quality of service provided. This study developed three different measures of quality of service for special transportation for the elderly and handicapped. Two of the measures were indices of quality in which the index is composed of eight aspects weighted by their relative importance to quality. The aspects are: reliability; comfort; convenience; extent of service; vehicle access; safety; driver characteristics; and responsiveness or ease of dealing with the office. Each aspect is made up of attributes of service (e.g.: reliability includes attributes related to wait time and on-time performance). For the first index, the weights were developed from responses to a survey of a panel of experts. For the second index, the weights were developed from responses to a survey of elderly and handicapped people. The third measure used what the authors call production function or input utilization analysis and was based on data from providers on the resources they use to produce the service. The three measures were applied to forty-two actual providers of special transportation in the Chicago region. Statistical analysis of the forty-two providers indicate that quality tends to increase as the size of the provider increases and that private providers (either for-profit or not-for-profit) tend to provide a higher quality of service than public providers.

Pagano, AM McKnight, C Dichter-Figuerera, M  
Illinois University, Chicago, Urban Mass Transportation  
Administration Final Rpt. UMTA-IL-11-0028-83-1, May 1983,  
10p Contract IL-11-0028  
ORDER FROM: NTIS PB83-255604

34 381040

**QUALITY OF SERVICE IN SPECIAL TRANSPORTATION FOR THE ELDERLY AND HANDICAPPED**

Special transportation for the elderly and handicapped is provided by a number of different types and sizes of organizations. Examples of different types of providers include private, non-profit social service agencies that primarily provide service for their own clients, transit authorities that operate a demand-responsive service to meet Federal requirements, and taxi companies that have purchase of service agreements with municipalities. This report describes the third year of a three-year study of the effect of the size and type of organization on the service provided. In the first year, economies of scale in special transport was investigated; in the second year, the effect of coordination on provision of special transportation was studied; and in the third and final year, a methodology to measure quality of service in the provision of transportation for the elderly and handicapped



was developed. The methodology was used to develop quantitative measures of service quality. These measures were then used to determine the effect of size and type of organization on quality of service provided. This study developed three different measures of quality of service for special transportation for the elderly and handicapped. Two of the measures were indices of quality in which the index is composed of eight aspects weighted by their relative importance to quality. The aspects are: reliability; comfort; convenience; extent of service; vehicle access; safety; driver characteristics; and responsiveness or ease of dealing with the office. Each aspect is made up of attributes of service (e.g.: reliability includes attributes related to wait time and on-time performance). For the first index, the weights were developed from responses to a survey of a panel of experts. For the second index, the weights were developed from responses to a survey of elderly and handicapped people. The third measure used what the authors call production function or input utilization analysis and was based on data from providers on the resources they use to produce the service. The three measures were applied to forty-two actual providers of special transportation in the Chicago region. Statistical analysis of the forty-two providers indicate that quality tends to increase as the size of the provider increases and that private providers (either for-profit or not-for-profit) tend to provide a higher quality of service than public providers.

Pagano, AM McKnight, C Dichter-Figuerera, M  
Illinois University, Chicago, Urban Mass Transportation  
Administration Final Rpt. UMTA-IL-11-0028-83-2, May 1983,  
n.p. Contract IL-11-0028  
ORDER FROM: NTIS PB83-255612

### 34 381042 TRANSPORTATION NEEDS OF THE ELDERLY AND THE HANDICAPPED IN A SMALL CITY

Although many studies have been done on the problems that the elderly and the handicapped have with using public transportation systems, not enough research has been done to determine their travel characteristics and transportation needs in a small city. This report helps to fill a gap by analyzing the needs and availability of transportation to the elderly and handicapped in Tuskegee, Alabama, a city of approximately 13,500. The purpose of this study was to investigate the travel needs of the elderly and the handicapped in Tuskegee and to compare these needs with those of the general population. The study also investigated the current modes of transportation available to the elderly and handicapped, and asked the residents' opinions for methods needed to improve the existing modes. A survey was used to obtain information regarding respondents' socioeconomic and physical characteristics, transportation requirements, and transportation availability. The survey revealed that the number of round trips made by both the elderly and the handicapped differed from the general population for essential and non-essential activities. The mode of transportation also differed for different groups of respondents, with the non-elderly handicapped having the highest reliance on private automobile and taxi and bearing the highest cost of transportation for all activities. The research also revealed that both the elderly and the handicapped chose cost and reliability as the most important factors in determining the availability/adequacy of a transportation system. A number of questions were included in the survey to get the respondents' opinion of the existing public or volunteer-provided transportation in Tuskegee. A review of literature and a bibliography are included.

Sara, TS McGowan, PN  
Tuskegee Institute, Urban Mass Transportation Administration Final  
Rpt. UMTA-AL-11-0001-83-1, Sept. 1982, 53p Contract AL-11-0001  
ORDER FROM: NTIS PB83-254284

### 34 381476 CODE OF PRACTICE AND SPECIAL PROVISIONS FOR THE CARRIAGE OF WHEELCHAIRS ON PUBLIC SERVICE VEHICLES (PLUS ANNEX 2)

The code of practice is intended to apply to public service vehicles designed to carry passengers seated in wheelchairs and which in a fully-seated configuration have a passenger capacity of 17 or more. Vehicles may be adaptable so that seats may be replaced by the provision for wheelchairs as the need arises. In such cases all conditions of layout should be approved. While every vehicle shall comply in all respects with regulations applying to public service vehicles, exemptions from certain aspects of the regulations may be provided by issue of a special order until the psv regulations can be amended. General requirements for wheelchair accommodation are de-

tailed covering: entrance/exit; emergency door; wheelchair locations and restraints; and apparatus for boarding and alighting of passengers in wheelchairs. Annex 2 to the report lists approved harness and locking equipment, from a number of manufacturers, designed to adapt various vehicles to carry wheelchair-seated passengers. (TRRL)

Department of Transport, England Monograph Pub VSE 518, May 1982, 32p, 13 Fig., 1 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 272762)  
ORDER FROM: Department of Transport, England, Vehicle  
Standards and Engineering Division, 2 Marsham Street, London  
SW1P 3EB, England

### 34 381484 ELEVATED PLATFORMS AT BUS STOPS IN HALMSTAD [NIVAHAALLPLATSER I HALMSTAD]

Since 1979, Halmstad town and Volvo have been running an experiment on elevated platforms at bus stops. These platforms are installed along a system of bus streets, are about 5 cm lower than the floor of the bus, and are approached by ramps at a maximum slope of 1:12. The buses are equipped with 50 cm wide extensible platforms for use at elevated platforms, and with collapsible steps for use at ordinary stops. Initially, guidance loops were installed at approaches to elevated platforms which were intended to take over steering and braking, but these were disliked by drivers and have been dropped. The only guidance equipment left is a signal indicating the presence of an elevated platform. It is evident from the investigation that the scheme is of great benefit to older and disabled people who have difficulty in getting on and off buses at ordinary stops. Drivers also like the idea of the elevated platform. It is estimated that up to 70% of stops on ordinary streets can be fitted with platforms without difficulty, and a further 20% after some modifications. It is planned in the second stage of the experiment to convert stops along some routes in the town centre. (TRRL) [Swedish]

Kollektivtrafikberedningen Monograph KTB Rapport 1983:8, 1983,  
36p, 9 Fig., 6 Tab., 7 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 2/2536), National Swedish  
Road & Traffic Research Institute  
ORDER FROM: Kollektivtrafikberedningen, P.O. Box 1339, Solna,  
Sweden

### 34 381494 TRANSIT VEHICLES FOR THE DISABLED: A CANADIAN PERSPECTIVE

Transportation services for the handicapped can be provided by making transit vehicles fully accessible or by provision of a parallel service. This latter service may utilize vehicles that range in capacity from a single wheelchair, to those that carry up to seven or so wheelchair passengers. This article reviews vehicles commonly used in paratransit service and provides data on vehicles under development and on two vehicles developed in Europe and available in North America. The results of surveys on vehicle evaluation by user groups and operators are presented. The attributes of the "ideal" vehicle are noted. It is apparent that all vehicles currently in use exhibit various shortcomings, however one particular vehicle under development (by Ontario Bus Industries) appears very promising. If this vehicle can successfully satisfy user and operator requirements it will be a major advance in the provision of transportation services for the disabled.

Kaulback, PJ (De Leuw Cather, Canada, Limited) *Specialized  
Transportation Planning and Practice* Vol. 1 No. 4, 1983, pp 339-  
360, 9 Fig., 4 Tab., 5 Ref., 3 App.

ORDER FROM: Gordon and Breach Science Publishers Limited, 42  
William IV Street, London WC2N 4DE, England

### 34 381572 EDUCATION AND WELFARE TRANSPORT SERVICES: THEIR ROLE IN PUBLIC TRANSPORT PLANNING

This paper initially provides a brief outline of the nature and extent of ambulance services, local authority social services and education transport, and voluntary transport in Britain. It discusses the links between these and the possibilities for improving co-ordination. It then considers their role in a general planning framework from the point of view of assessing needs,

designing policies and evaluating alternatives. Studies aimed at measuring needs are cited and examples are given of policy alternatives in practice.

Bailey, JM

Oxford University, England TSU/REF-080/CP, Aug. 1979, 35p

ORDER FROM: NTIS PB84-112952

### 34 381699

#### PLANNING TRANSPORTATION SERVICES FOR HANDICAPPED PERSONS USER'S GUIDE

This user's guide has been prepared as part of National Cooperative Highway Research Program (NCHRP) Project 8-27 to determine the more cost-effective means of meeting the transportation needs of handicapped people. The purpose of the guide is to provide planners, whether they are employed with a transit agency, city government, or metropolitan planning organization, with guidelines that will permit them to identify cost-effective solutions to the problems of providing for the transportation needs of handicapped people. These guidelines should be of specific use to planners who investigate the more cost-effective ways transit operations can meet various regulations concerning handicapped services. The material presented in this document should assist planners in identifying and evaluating alternative ways of providing mobility to the general handicapped population who have difficulty using regular public transportation services. The intent of these guidelines is to address the mobility needs of an entire population as well as specific market segments of transportation handicapped persons with diverse travel needs, located throughout a geographical area. Experience has shown that only a small percent of the total eligible transportation handicapped market is likely to avail themselves of these services, even though the services are provided to the entire market segment. (Author)

Wegman, FJ Heathington, KW Middendorf, DP Redford, MW Chatterjee, A Bell, TL (Tennessee University, Knoxville) NCHRP Report No. 262, Sept. 1983, 74p, 16 Fig., 54 Tab., Refs., 4 App.

ORDER FROM: TRB Publications Off

### 34 382584

#### HSTC—CONSOLIDATION OF HUMAN SERVICE TRANSPORTATION IN BRIDGEPORT, CONNECTICUT

In the context of a larger Service and Management Demonstration of multimodal transportation brokerage in Bridgeport, Connecticut, and operating model of an effective consolidated elderly and handicapped transportation network was devised and implemented. The resulting system is known as the Human Service Transportation Consortium (HSTC), which has been successfully operating since September of 1980. Several aspects of the project are innovative, including the consortium concept itself, and the role of the Greater Bridgeport Transit District (GBTD), in developing the service. The consortium is built on the model of a private non-profit corporation, which consolidates and maintains members' existing transportation resources and sells services to members at contractually determined rates. GBTD was able to help formulate the consortium by contributing technical assistance and helping in the acquisition of initial capital funding, but was able to maintain an independent advisory role following implementation. Strong support from local health and social service agencies, enhanced by growing financial need, were key factors in the effective consolidation. The consortium transports over 12,000 monthly riders in the Bridgeport region with a fleet of 25 vehicles. Immediately upon implementation, the HSTC realized a doubling of productivity over a pre-existing Coordinated System. The HSTC carries an average of four passengers per vehicle hour. Costs average \$11.80 per vehicle hour and \$2.90 per passenger trip.

Kuzmyak, JR

Comsis Corporation, Urban Mass Transportation Administration, (DTS-64) Final Rpt. UMTA-CT-06-0008-83-1, DOT-TSC-UMTA-83-44, Dec. 1983, 100p, Figs., Tabs., 6 App. Contract DOT-TSC-1753

ORDER FROM: NTIS PB84-157890

### 34 382627

#### MARKETING FUNCTIONS IN HUMAN SERVICE AGENCY TRANSPORTATION

This paper reviews the manner in which marketing is done in a relatively recent addition to the non-profit transit sector in the United States, Human

Service Agency Transportation (HSAT). This is the title given to a family of specialized transportation services which have been developed to provide better mobility for clients of human service agencies. The report points out that historically, marketing for non-profit organizations such as HSAT has either been ignored or reduced to a very minor function. This report describes the origin, development, and current status of HSAT, and how these factors affect their marketing environment. The consumer orientation and exchange perspective of modern marketing are reviewed and the influential characteristics of non-profit organizations are discussed. In reviewing how HSAT does marketing, this document goes beyond the narrow concept that marketing is synonymous with selling and promotion. Rather than focusing on selling and promotion, the orientation is toward serving the consumer's needs. The paper also describes each of the essential marketing functions for HSAT, which are: developing a marketing plan; conducting research; designing the service; evaluating and improving the service; pricing services; and promoting the system. The authors note that the review of each function is not meant to serve as a "how to do it manual", but rather to identify specific activities which are, or should be, conducted under each function. Deficiencies in HSAT marketing are described and comparisons are made between the marketing functions performed by conventional transit and marketing for HSAT. The report concludes that HSAT has developed outside the conventional transit industry and exhibits significantly different marketing dimensions. While many transit marketing efforts are oriented to capturing additional passengers, HSAT marketing is more concerned with providing a service which is responsible to the needs of agency clients.

Saltzman, A

North Carolina Agricultural and Technical State U, Urban Mass Transportation Administration Final Rpt. UMTA-NC-11-0009-83-8, Sept. 1983, 22p Contract NC-11-0009

ORDER FROM: NTIS PB84-129618

### 34 382760

#### INFORMATION NEEDS OF THE ELDERLY

This study, which was commissioned by the Department of Health & Social Security, examined information on benefits and services for the elderly and how the elderly use that information. It is pointed out that there has been no comprehensive or detailed study of information needs among different elderly groups across the country and no research attention to the information needs of case workers serving the elderly. The old elderly (over 74), the immobile and the rural elderly are those with acute information needs. The disadvantages of the older, immobile and rural are seen in part as the consequences of an information distribution system which depends on people's ability to get to the central points where information is available. All three groups have restricted mobility and all were found to have seen fewer information leaflets and to be less informed than those without mobility problems. With the reduction of accessibility problems the disadvantages of the immobile disappear. An attempt is made to identify areas where information needs are not being met and viable alternatives are suggested. A survey of the elderly was carried out by conducting personal interviews with 905 people aged 65 years and over living in a variety of typical locations. The results of this survey are presented in a series of detailed tables.

Epstein, J

Research Institute for Consumer Affairs Monograph June 1980, 96p, 22 Tab., Refs

ACKNOWLEDGMENT: TRRL (IRRD 273553)

ORDER FROM: Research Institute for Consumer Affairs, 14 Buckingham Street, London, England

### 34 384581

#### TRAVEL IN THE COUNTY OF TROMS, NORWAY, COVERED BY THE SOCIAL SECURITY SYSTEM [TRYGDEREISER I TROMS; EN UTVALGSUNDERSOEKELSE]

The report describes objects and results from an examination of selected data on ambulance and patient travel covered by seven social security offices in Troms, Norway, during the autumn of 1982. Comparisons with annual account figures show that the data recorded provided a good picture of the extent and structure of these journeys on a yearly basis. It is concluded that the public health sector in Troms, through planning and use of various means, will be able to significantly reduce expenses used for ambulance transport and patient travel. Problem areas which should be looked at more closely are suggested. (TRRL) [Norwegian]

Tretvik, T  
Selskapet f Industriell Teknisk Forsking VED NTH No. STF63  
A83002, Mar. 1983, 40p, 2 Fig., 17 Tab., 6 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 274457), Norwegian State  
Highway Laboratory  
ORDER FROM: Selskapet f Industriell Teknisk Forsking VED  
NTH, Trondheim-nth, Norway

**34 384594**

**HANDICAPPED PEOPLE IN THE MUNICIPALITY OF  
MELOEY [FUNKSJONSHEMMETE I MELOEY]**

This report is an extract of a special study from field work in a municipality in north Norway, during the autumn of 1980. It aims at elucidating the transport situation of the disabled persons in the area, and presents important background information such as income, age, sex, local community conditions, and information about ways of travelling, and destinations. In a later, larger report analyses of the disabled persons situation will be performed on a broader basis. (TRRL) [Norwegian]

Houg, T Haukeland, JV *Transport og Velferd* No. 11, 1982, 15p, 3 Fig., 1 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 274472), Norwegian State  
Highway Laboratory  
ORDER FROM: Institutt for Samfunnsforskning, Munthesgt 31, N-  
Oslo 2, Norway

**34 384659**

**TRANSPORTATION FOR OLDER AMERICANS. ISSUES AND  
OPTIONS FOR THE DECADE OF THE 1980'S**

This report provides information to support state and local governments with planning, policy formulation and program implementation for transportation services for the elderly. Material is drawn largely from (1) demographic and social data on the elderly derived from the 1980 Census and (2) findings and proposals from the 1980 Mini-Conference on Transportation for the Aging. The report is in five main sections. It begins with a background statement of issues, identifying changing conditions that lie ahead. This is followed by a section detailing the demographic, economic and social changes among the elderly as revealed by data from the Census. The third section addresses the transportation implications of the changes revealed by the Census. The fourth section analyzes three major issues relevant to transportation—inflation, energy and funding. The final section is a detailed report on policy, planning and program issues and options in serving the elderly and handicapped highlighting topics stressed by the White House Conference.

Bell, WG Revis, JS  
Florida State University, Tallahassee, Revis and Associates,  
Incorporated, Office of the Secretary of Transportation Final Rpt.  
DOT-I-83-42, Apr. 1983, 58p, 3 Fig., 12 Tab.

ORDER FROM: OST

41 380199

**EMPIRICAL ANALYSIS OF HOUSEHOLD ACTIVITY PATTERNS**

A framework is developed for analyzing the movement of individuals through time and space based on principles of pattern recognition theory. The procedures developed are applied to a sample of residents of a highly diversified region in Southern California. The results indicate that the daily activity/travel patterns of these individuals can be classified into a relatively small number of categories. Analysis of these patterns yields information regarding the influence of both socio-economic characteristics and urban form on the travel needs of individuals. The potential usefulness of the methodological framework in policy analysis is illustrated by several examples involving possible responses (e.g. tripchaining, use of small special purpose urban vehicles) to constraints on travel imposed by gasoline rationing program.

Recker, WW Root, GS McNally, MG Cirrincione, MJ Schuler, HJ  
California University, Irvine, Department of Transportation Final Rpt. DOTRSPA/DMA-50-83/19, Nov. 1980, 159p Contract DOT-RC-92010

ORDER FROM: NTIS PB83-236950

41 380829

**UNEMPLOYMENT AND TRANSPORT AVAILABILITY IN METROPOLITAN MELBOURNE**

The results of a study of the relationship between transport factors and unemployment in Melbourne are presented and described. The uneven spatial distribution of unemployment levels in the metropolitan region is explored and the extent to which this pattern may be associated with transport factors. Several aspects of employment location were identified as having a possible bearing upon access to jobs and, hence, the pattern of unemployment. Residential patterns of specific groups known to exhibit high levels of unemployment were examined and regression analysis was used to establish the impact of socio-demographic factors upon spatial variations in unemployment levels. Overall, the analysis revealed that unemployment levels vary throughout the Melbourne metropolitan area in a manner consistent with the proposition that the incidence of unemployment is at a maximum in areas where transport and locational conditions combine to produce greatest average journey to work times. The analysis indicates that there is statistical evidence of a link between the spatial distribution of unemployment and transport factors. The nature of the data used and the methodology do not permit statements to be made about causal relationships. However, it is apparent that while transport is not likely to be involved in determining the overall level of unemployment, it does have some influence on the distribution of unemployment. (TRRL)

Faulkner, W Nelson, R  
Australian Government Publishing Service Monograph Occasional Paper 53, 1983, 131p, Figs., Tabs., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 266475), Australian Road Research Board

ORDER FROM: Australian Government Publishing Service, 109 Canberra Avenue, Griffith, A.C.T., Australia

41 380837

**UNDERSTANDING TRAVEL BEHAVIOUR**

The main objective of this five-year study was to obtain a better understanding of household travel behaviour, and to develop an analytical and modelling capability that would enable this knowledge to be applied in transport research and planning. The project comprised four main phases: (1) Diagnostic studies. A phase of exploratory studies (Jericho exploratory study and the Eynsham pre-pilot study) and main surveys (Abingdon pilot survey and Banbury activity-travel studies) and formulation of concepts; (2) Understanding daily behaviour. A qualitative and quantitative examination of daily patterns of household behaviour, and their variation by type of household; (3) Household adaptation. This phase consists of additional surveys concerned more specifically with the dynamics of response to change; (4) Model development. A final phase in which the role of models is considered in the light of project findings, and a new form of activity-based travel demand model is developed. (TRRL)

Jones, PM Dix, MC Clarke, MI Heggie, IG (Oxford University, England)

Gower Publishing Company Limited Monograph 1983, 279p, Figs., Tabs., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 270984)

ORDER FROM: Gower Publishing Company Limited, Gower House, Croft Road, Aldershot, Hampshire, England

41 380841

**SOCIO-ECONOMIC AND ENVIRONMENTAL INFLUENCES ON THE PLANNING AND DESIGN OF RESIDENTIAL TRANSPORT FACILITIES**

This paper reviews the pressure for change in the planning and design of residential transport facilities, and discusses the likely effects on the life style of urban residents of the scarcity of energy, current metropolitan transport problems and the policies for their solution. The need for change is illustrated through a description of the problems inherent in existing road layout and design. Amongst these are traffic conflict and safety; the difficulty of providing viable public transport services; inconsistencies between current and future use of facilities and their design standards; environmental factors such as noise, privacy and aesthetics, and finally, the high cost of services and serviced land. A description is given of a research project which aims to evaluate current design standards in South Africa, and preliminary findings and conclusions are reported. (TRRL)

Cameron, JWM  
National Institute for Transport & Rd Res, S Af Monograph RR 311, 1980, 15p, 3 Fig., 2 Tab., 26 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 271140)

ORDER FROM: National Institute for Transport & Rd Res, S Af, P.O. Box 395, Pretoria 0001, Transvaal, South Africa

41 380858

**POPULATION GROUPS WITH HOMOGENEOUS TRAVEL PERFORMANCE BY CAR, PUBLIC TRANSPORT AND BICYCLE [BEVOLKINGSGROEPEN MET EEN HOMOGENE VERVOERPRESTATIE PER AUTO, OOPENBAAR VERVOER EN FIETS]**

Attention is given to the "travel performance", i.e. the number of kilometers travelled by mode of transportation. Every individual has a unique travel performance. The purpose of this paper is to classify these persons in groups by their socio-economic demographic aspects, in order to homologize the number of kilometers travelled by mode of transportation in these groups as much as possible. In 1978 the Netherlands Bureau of Statistics investigated travel behaviour by means of a survey of home-based interviews. These observations have been used to classify the population by segmentation methods. This method has been derived from the maximum likelihood estimation theory of Fisher, supposing the observations are Poisson distributed. It is suited to make classifications which are optimal with regard to certain stated problems. In the present case the travel performances have been subdivided into car drivers, passengers by car, train and bus, cyclists and walkers. Fifteen demographic, socio-economic factors and other factors were considered. The most important factors proved to be car availability, age, personal income, housewives with or without children. Groups arise which differ widely with regard to vehicle use and kilometers travelled. (Author/TRRL) [Dutch]

Hamerslag, R (Delft University of Technology, Netherlands)  
Colloquium Vervoersplanologisch Speurwerk Colloquium 1982, 1983, pp 309-332, 2 Fig., 2 Tab., 10 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 270677), Institute for Road Safety Research SWOV

ORDER FROM: Colloquium Vervoersplanologisch Speurwerk, P.O. Box 45, Delft, Netherlands

41 380859

**GOOD CONNECTING LOCAL PUBLIC TRANSPORT AND THE MODAL CHOICE IN THE REGIONAL JOURNEY TO WORK [DE INVLOED VAN EEN GOED AANSLUITEND LOKAAL OPENBAAR VERVOER OP DE AUTO. OPENBAAR VERVOERKEUZE BIJ INTERSTEDELIJKE WOONVERKRELATIES]**

Travellers having a choice predominantly choose the train for their regional journey to work (70 to 80%) if the work location is situated within a short walking distance from the arrival station (and if the train is a realistic

alternative). This result from previous research leads to the question of whether a good connecting local public transport on the work side could considerably extend the area of train preference. The authors have chosen as a research-situation Rotterdam-Central railway station and the connecting underground. The research among workers in offices located in a corridor along the underground leads to a positive conclusion on this question. The percentage of train choosers near the railway station and within 2 km distance in the underground direction is roughly constant at 70%. (TRRL) [Dutch]

Vantvoort, JT Blom, JA (Delft University of Technology, Netherlands)  
Colloquium Vervoersplanologisch Spuurwerk Colloquium 1982, 1983, pp 619-640, 6 Fig., 5 Tab., 3 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 270691), Institute for Road Safety Research SWOV  
ORDER FROM: Colloquium Vervoersplanologisch Spuurwerk, P.O. Box 45, Delft, Netherlands

**41 380860**  
**THE JOURNEY TO WORK IN ROTTERDAM [DE WOONWERK VERPLAATSING IN ROTTERDAM]**

A study has been made in the town centre of Rotterdam of the transport mode selection of people working in the town centre and living within 500 metres vicinity of the underground railway line Hoogvliet-Centraal Station. The population studied consists of people, who have the possibility of using a car as driver for their journey to work but do not need the car for their work or work activities. Of these people, for whom the metro is a very reasonable alternative, 78% prefer the metro. The result of the study is that the time element is the most important factor in the selection. The change in transport mode has almost no influence on journeys inside the city. Within the chosen area of influence the distance to be covered after transport (in this study maximum 600 metres) had no influence. (TRRL) [Dutch]

Nijman, GJ Blom, JA (Delft University of Technology, Netherlands)  
Colloquium Vervoersplanologisch Spuurwerk Colloquium 1982, 1983, pp 651-670, 2 Fig., Tabs., 3 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 270692), Institute for Road Safety Research SWOV  
ORDER FROM: Colloquium Vervoersplanologisch Spuurwerk, P.O. Box 45, Delft, Netherlands

**41 380882**  
**TRANSPORTATION MODELING: LESSONS FROM THE PAST AND TASKS FOR THE FUTURE**

In spite of the recent progress made in household activity analysis and travel budget studies, urban transportation modeling still remains a "not-too-well developed" research field. There are conflicting theories, analysis units are not uniform, terms are not precisely defined, basic studies of sub-systems involved are not yet completed, and many models lack behavioral background as well as basic attributes such as simplicity, sensitivity, compatibility, transferability and forecasting ability. Gaps in methodology may be partially responsible for this situation. There is an urgent need for simple, yet not primitive, easily applicable urban transportation models which can respond to the technical needs of planners and engineers. Lessons from the past, as well as experiences from other disciplines, suggest that future research should concentrate on: (1) new, "unconventional" approaches based on systematic, basic studies of all sub-systems involved; (2) proper definition and stratification of an analysis unit; (3) revision and unification of definitions, classifications, etc., in order to improve the behavioral background of the models; (4) dynamic rather than static approaches, able to describe feedbacks between transportation and land-use as well as between transportation demand and supply; (5) interrelations between subsequent sub-models, particularly between car availability, trip generation and modal split; (6) developing models which are not only sensitive to transportation policies but also to other local policies (e.g. land use, city development, social, etc.). (Author/TRRL)

Supernak, J (Drexel University, Philadelphia) **Transportation (Netherlands)** Vol. 12 No. 1, Aug. 1983, pp 79-90, Refs.

ACKNOWLEDGMENT: TRRL (IRRD 272386)  
ORDER FROM: Elsevier Scientific Publishing Company, P.O. Box 211, Journal Division, 1000 AE Amsterdam, Netherlands

**41 381482**  
**BENEFIT AND COST ITEMS FOR THE FINANCING OF PUBLIC TRANSPORT [NYTTA, KOSTNADSBAERARE FOER FINANSIERING AV KOLLERKTIVTRAFIK]**

Is it reasonable from a national economic standpoint to have a high public transport standard financed by taxes? What proportion of costs should be covered by fares? Who actually benefits from good public transport? Can costs be allocated to cost items on the basis of benefit? What are the reasonable political goals in a stagnating (high level) economy? This study mainly deals with the allocation of costs on the basis of benefit. It is relatively easy to determine the costs of public transport. The main principle in determining benefit is the difference in cost in obtaining the benefit. Costs are borne principally by travellers, the business sector and the municipality. There is increasing demand for public transport. In order that public transport may be operated at an optimum level, demand and factors determining this must be ascertained. Marginal pricing of public transport which is recommended from the national economic standpoint causes the traffic companies to incur large deficits. Different methods of pricing must be investigated. A programme is presented for empirical investigation of this problem area. Benefit will be studied in relation to (1) public transport users, (2) business sector, (3) other interested parties. Part projects will examine changes in supply and relocation of public transport. (TRRL) [Swedish]

Cleasson, AA Segerfelt, A  
Royal Institute of Technology, Sweden, (0349-4373) Monograph  
Tratikplan Medd 54, 1983, 22p, 4 Fig., 21 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272538), National Swedish Road & Traffic Research Institute  
ORDER FROM: Royal Institute of Technology, Sweden, Fack S-10044, Stockholm 70, Sweden

**41 381525**  
**TECHNOLOGY AND ITS SOCIAL IMPLICATIONS: THE EXAMPLE OF THE PARIS PUBLIC TRANSPORT SYSTEM (1900-1983) [TECHNOLOGIES ET EFFETS SOCIO-PROFESSIONNELS: LE CAS DES TRANSPORTS COLLECTIFS PARISIENS (1900-1983)]**

In the space of a few years the Paris Transport Authority (RATP) has radically transformed production methods for urban mass transport. This paper, which is the result of research carried out under the auspices of the ATP Research Mission for the Socio-Economics of Transport, reconstructs the conditions which prevailed prior to the changes, in order to clarify present attitudes towards modernisation work. It is divided into four parts: history of public transport in Paris; the mechanical-electric production process (1890-1970), modernisation work in context: the urban transport crisis; the automated production process (1970 onwards). [French]

Bouvier, P  
CNRS-Centre d'etudes sociologiques Mar. 1983, 243p, 10 Fig., 10 Tab., 10 Phot., 10 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: CNRS-Centre d'etudes sociologiques, Mission de la recherche, Paris, France

**41 381556**  
**OPERATION PUBLIC TRANSPORT IN CARRICK, A REPORT ON THE HOUSEHOLD AND TRAVEL DIARY SURVEY MOUNTED IN SOUTH AYRSHIRE AS PART OF THE GREATER GLASGOW PTE'S OPERATION PUBLIC TRANSPORT IN CARRICK (OPTIC) STUDY**

A detailed study was made of a representative selection of households in Carrick in South Ayrshire, Scotland. The purpose of the study was to define areas of potential improvement in local bus services. Details of travel habits of members of 511 households were acquired from questionnaires. A comparison was made between bus patronage and car use to various destinations within the area. It was concluded that: some local services could be improved; the timing of peak hour services sometimes did not coincide with potential demand; the length of time passengers had to stay in some settlements before catching a return bus was sometimes too long; and co-ordination of local and longer-distance bus services could be improved.

Oxley, PR

Cranfield Institute of Technology Jan. 1979, 75p

ORDER FROM: NTIS PB83-258046

41 381566

#### VALUES OF TRAVEL TIME FOR HOUSEWIVES

Housewives have tended to be broadly ignored by time valuation studies, and by the Leitch Report, but study shows their travel to be of great and increasing importance. On the theoretical side, the building blocks were neoclassical time valuation studies, behavioral studies of transport demand, and certain recent criticisms of these. The data source was a series of 153 interviews of which 143 were short, 10 were in-depth using the Oxford TSU-developed household activity-travel simulator. Specific conclusions suggested include the following:-(1) Populations of transport users for shopping vary in time values and response to stimuli, in a way masked by traditional transport demand models; (2) Housewives have a high value of time both in theory and when questioned, during their working lives (i.e. before children leave the home), values not revealed by demand models; (3) Car availability distorts modelled time values and choice processes focussed on time and cost.

Davis, EP

Oxford University, England TSU/REF-139/CP, 1983, 22p

ORDER FROM: NTIS PB84-111350

41 381570

#### ASSESSING POLICY IMPACTS USING THE HOUSEHOLD ACTIVITY-TRAVEL SIMULATOR

The Transport Studies Unit is undertaking a program of research into household travel decision making with the aim of improving understanding of travel behavior so as to assist policy formulation and evaluation. In the process it has evolved a distinct methodological approach in which travel is studied in the broader context of daily life, using a blend of qualitative and quantitative techniques. This research is leading to a detailed understanding of the household travel decision process at a conceptual level, from which it is possible to abstract elements relevant to a particular situation and construct appropriate models for heuristic, predictive and evaluative purposes. The Household Activity-Travel Simulator (HATS) represents one new development.

Jones, PM

Oxford University, England TSU/REF-039/WP18, Oct. 1977, 34p

ORDER FROM: NTIS PB84-111962

41 381575

#### TRAVEL DEMAND, TRIP-MAKING AND GEOGRAPHIC MOBILITY AS THEY RELATE TO FAMILY LIFESTYLE

Travel demand, trip-making and geographic mobility were investigated for their relationships with family lifestyle (single-and two-parent families) among 305 families residing in the metropolitan Washington area. The results show that two-parent families have more transportation related choices and are more likely to own one or two cars than single-parent families. The two types of families show no significant differences in travel demand or use of carpools.

Savage, JE, Jr Adair, AV

Howard University, Department of Transportation Final Rpt.  
DOTRSPA/DMA-50-83/16, Mar. 1982, 116p Contract DOT-OS-80005

ORDER FROM: NTIS PB83-251801

41 381593

#### ESTIMATING THE ECONOMIC BENEFITS FROM PUBLIC TRANSPORT SUBSIDY

Based on earlier work by Dr. Stephen Glaister, and in conjunction with him, the Department of Transport have developed a computer model for the assessment of the economic benefits given by local public transport subsidy. This work is particularly relevant in the light of the House of Lords' judgement in relation to London transport, and the subsequent reference to "benefits" in the new Transport Act. The aim of the assessment method is to make a fully comprehensive evaluation of the total transport benefits resulting from a public transport fare or service level change. In addition to bus and underground, rail and private road transport effects are therefore also included. Benefits are calculated in the conventional manner in relation to changes in demand, specifically as the

net social benefit, equal to the increase in gross benefits minus any corresponding increase in subsidy. Thus, in the case of a fares reduction, additional costs to tax and rate payers are subtracted from the benefits to passengers. The model is driven by assuming that travellers' behaviour is rational in terms of generalised cost; thus the demand response to changes in service level is related to empirical fares elasticities through standard values of time. Effects on traffic congestion are taken into account through speed-flow curves; and any change in public transport overcrowding is allowed for in terms of changes in waiting time. What matters, as a criterion, in using the model are the marginal benefits per additional L1 of subsidy from any change in policy. This criterion can be used to assess whether fare and service levels are in sensible balance, in which case the marginal benefit/L would be approximately the same for either a fare or service level change; and, assuming that subsidy is thus used in a balanced way to give the highest benefits, subsidy levels in different areas can be compared in terms of benefits value-for-money. The results to date suggest that, in fact, fares and service levels are often out of balance; and that the value for money at the existing subsidy levels in different areas varied considerably. The marginal benefits/L of South Yorkshire's low fares policy is substantially lower than the values being obtained elsewhere; and there is a clear difference in this respect between London's "fares fair" policy and the increased fare levels which followed the House of Lords' judgement. It is not claimed that the benefits accounted in this method are the only positive social gain from subsidy. But in that they include in principle major effects on the whole transport system, they are at least important. Although the main application of the method to date has been in assessing subsidy policy at the aggregate, city-wide level, an important advantage of the method is that it is equally applicable in principle to individual bus routes. (Author:TRRL)

Transport Policy. Proceedings of Seminar M held at the PTRC 11th Summer Annual Meeting, University of Sussex.

Glaister, S (London School Of Economics); Searle, G *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* 1983, pp 5-18, 2 Fig., 3 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 273080)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

41 381599

#### ECONOMIC JUSTIFICATION OF REDUCED PUBLIC TRANSPORT FARES ON MERSEYSIDE IN THE SHORT AND THE LONG RUN

The British government's 1982 white paper "Public transport subsidy in cities" noted that the government would require London and the metropolitan counties to describe and evaluate the benefits they thought were being achieved from public transport subsidy. This paper outlines a possible framework for considering the economic benefits of lower public transport fares in cities. It reviews experience with cheaper fares on Merseyside since October 1981, and provides some estimates of the short-run benefits of these fare reductions under alternative assumptions about the fares elasticity of demand for transit services. The paper then considers the opportunity costs of increased public subsidies and the calculation of the shadow price of subsidy funds. These shadow prices are compared with critical shadow prices which, if exceeded, would lead to overall welfare losses in the economic efficiency sense being sustained as a result of the Merseyside fare reductions. The paper draws a distinction between short-run pricing policy (to achieve optimum use of existing capacity), and longer-run decisions concerned with the determination of capacity and service levels for conurbation transport services. Some suggestions are made as to how capacity levels might best be determined. (Author/TRRL)

Transport Policy. Proceedings of Seminar M held at the PTRC 11th Summer Annual Meeting, University of Sussex.

Dodgson, JS (Liverpool University, England) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* 1983, pp 65-76, 3 Fig., 1 Tab., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 273086)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Stand, London WC2, England

41 381605

**THE INFLUENCE OF THE COMBINATION OF EMPLOYMENT AND CHILD CARE ON TRANSPORT NEEDS**

In order to better understand the variations in transport needs between different segments of the population, the Netherlands ministry of transport is at present undertaking a number of studies directed towards people who live in specific situations. In this framework, the influence of household structure is a priority subject. In the Netherlands the participation of married women in professional work has been traditionally low, but is now rapidly growing. Also, the number of single adult households, where one parent, mostly a woman, has to combine professional employment with the responsibility for children, is augmenting fast. Traditional studies however, make in general distinctions between employed and unemployed population only, but do not take account of sex or presence of children in the household. It is an advantage, that the Dutch study can take place as part of a comparative study made possible by the German Marshall fund and covering France, the Netherlands, and the United States. The study is intended to meet the following objectives: (1) to understand how transportation patterns and needs differ as household and family characteristics differ; (2) to use such information to make accurate predictions of future travel patterns; (3) to understand if current transportation resources are adequate to allow households to carry out their necessary activities; and (4) to determine if transportation services and facilities could be made more responsive to the needs of all Dutch families, but particularly the growing number with children and two adult workers. The paper describes the theoretical and empirical backgrounds of the study, focusing on how an understanding of the activity patterns of households in different situations can make a significant contribution to transportation policy and planning. The paper explains how those differences are relevant for Dutch and other governmental policymakers and planners, and are being used as a factor to estimate tendencies in the development of passenger transport. It will conclude by describing how the Dutch study was structured to give new insights in this area and to build the growing body of international research in this area. (Author/TRRL)

Transport Policy, Proceedings of Seminar M held at the PTRC 11th Summer Annual Meeting, University of Sussex.

Ruehl, A (Ministry of Transport & Public Works, Netherlands);

Rosenbloom, S (Texas University, Austin); Kremer-nass, J (Institute for Social Research on Policy, Neth) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1983, pp 151-158, 1 Tab., 4 Ref.*

ACKNOWLEDGMENT: TRRL (IRRD 273093)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

41 381607

**THE CONCEPT OF NEED AND THE PROVISION OF SUBSIDY IN ROAD PASSENGER TRANSPORT**

This paper was submitted to the Chartered Institute of Transport in 1981 and received the BET road passenger transport award for that year. It is reproduced here by kind permission of the institute, in whom the copyright subsists. The paper is a tentative approach to the extension of transport studies into the field of the behavioural sciences, which, it is argued, is necessary if a paradigm of the transport industry is to be constructed which has serious predictive capacity. After a brief introduction, Part 2 addresses itself to the reality of need, as distinct from effective demand, as an origin of that motivation which may or may not give rise to the provision of transport services to secure its satisfaction. It recognises that, even after the market mechanisms have had full and unfettered play in residual need that, if it is left unsatisfied, may be a net disbenefit to a society that can apply its resources to it by transfer. Part 3 discusses the extent to which the free working of the market mechanisms may be inhibited, on the argument that there is no merit in approaching the problems of satisfying residual need until all possible steps have been taken to minimise it. It is recognised that the market within which transport is supplied and consumed is not and cannot be perfect, but that considerable possibilities exist for obviating its most serious imperfections. These are discussed under the headings: 1. Elasticities of demand; 2. In-elasticity of supply; 3. Institutional rigidities; 4. Organisational rigidities; 5. Technical rigidities; 6. Insufficient information; 7. Cross-subsidisation. In part 4 an approach is made to the nature of the residual need that might exist were all these imperfections to be minimised. The need for further work in this area is emphasised. In part 5, headed "how to do good", a number of approaches to the satisfaction of residual need by way of transfer payment are considered, with their

strengths and weaknesses, and starting from the assumption that internal cross-subsidisation is not an acceptable practice. The techniques considered are: 1. Deficit financing; 2. The payment of subventions to ensure the continuance of services which a commercial undertaking would otherwise withdraw (advocated in the United Kingdom by the Low committee's report of 1960); 3. The contractor/client relationship. Special attention is paid to the distortions that any form of intervention may produce, and it is concluded that some form of "fine tuning" is required, rather than across-the-board subvention. Finally part 6 concludes with some thoughts as to the place of professional transport managers in the situation that has been examined, and the paper closes with a plea for further work to be done towards the definition of a general theory of need. It places great stress upon the desirability of involving the public transport industry in the debates about this process. (Author/TRRL)

Proceedings of Seminar P held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Hibbs, J (Birmingham University, England) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1983, pp 1-17, 15 Ref.*

ACKNOWLEDGMENT: TRRL (IRRD 272883)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

41 381609

**THE PROPER ROLE OF SUBSIDIES FOR PUBLIC TRANSPORT**

This paper examines the relations between the socio-economic structure of urban areas, the costs of providing these urban areas with an adequate level of public transportation, generalised transportation costs and the rates to be charged. To decide the appropriate level of public transport, three approaches were used: the general model, the maximum-profit approach, and the cost-benefit approach. It is concluded that the actual approach to public transport is far from being either a cost-benefit or a maximum profit approach. Therefore, it is doubtful whether the present subsidies fulfil their proper role. (TRRL)

Proceedings of Seminar P held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

*Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 31-58, 2 Fig., 7 Ref.*

ACKNOWLEDGMENT: TRRL (IRRD 272885)

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41 381615

**THE INFLUENCE OF THE STRUCTURE OF THE FAMILY ON THE ORGANISATION OF ACTIVITIES AND TRIPS**

This article points out some of the most interesting results of research into the influence of the household, as a decision-making unit, on the behaviour of its members in terms of activity pattern. Analysis was made of the results of an activity-travel pattern survey carried out among 410 households from the suburbs of Lyon. The analysis is conducted at an individual level of men and women from each type of household, which is defined by the variable "family structure" (marital status, work status, presence of children and age structure, parents' age). The simultaneous use of three elements; activity patterns, time budgets and rates of involvement into activities, shows obvious cleavages in the space-time planning of activities of each member of the household. The analysis of common activities (children and parents or parents together) reveals interesting results, showing the influence of family interactions in the household (work in progress, taking the availability of a car into consideration). The description of daily travels by a great number of essential variables; number, travel time, number of outings, joint path, spatial shape, distance to the home, shows the influence of the organisation of activities inside every type of household on the way each household member plans his travel in time and space. (TRRL)

Proceedings of Seminar P held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Dekins, ST (Ecole Nationale des Travaux Publics de l'Etat, Fr) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 119-130, 10 fig., 11 Tab., 8 Ref.*

ACKNOWLEDGMENT: TRRL (IRRD 272891)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

41 381616

#### JOURNEY TO WORK

Those last years, several studies were conducted on daily commuting to work. Two inquiries were made at national level (1974 and 1978) and 5 analyses were applied to particular cities. A first conclusion is on the social differentiation in transportation behaviour. The average commuting time is longer for the higher income brackets among workers. The range variation appears to be quite large for blue collar workers. This can be related to the spatial texture of work locations and to economic and cultural differentiation. It can be also observed in use of different transports: public transport, cars, walking, bicycles. A second set of conclusions is about the complexity of the organisation of the commuting period. Journey to work is indirectly organised, specially for women and there is wasted time before the beginning of work. In large cities, family life is more split into individual activities in different parts of cities. (TRRL)

Proceedings of Seminar P held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Hanappe, O Pecheur, P (Cetur, France) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* 1982, pp 131-142, 1 Fig., 5 Tab., 13 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272892)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

41 382594

#### THE FINANCING OF PUBLIC TRANSPORT IN THE YEAR 2000: THE CONTRIBUTION OF THE "SOCIO-ECONOMIC PROFIT AND LOSS ACCOUNT"

Public transport enterprises have earnings limited by political policies or requirements to render services in the public economic interest. In Western nations the rises in real income and public policies with respect to transportation and land use have affected the viability of public transit. While public transit must utilize conventional commercial accounting, such a system cannot properly record services rendered in the public interest. The identification and valuation of socioeconomic services involves special problems. In socially oriented supplementary accounting it is necessary to differentiate between inputs and outputs through choice and evaluation of external effects. In West Germany a public transport organization has developed a socioeconomic profit and loss accounting with the socioeconomic accounting. Further information on social accounting is being gathered by the International Commission on Transport Economics and an attempt to standardize the analysis will probably be made.

Flieger, H (Dortmunder Stadtwerke AG) *UITP Revue* Vol. 32 No. 4, 1983, pp 309-315, 4 Fig.

ORDER FROM: International Union of Public Transport, Avenue de l'Uruguay 19, B-1050 Brussels, Belgium

41 382755

#### TRANSPORTATION AND THE POOR

This paper examines the transportation problems of those with limited resources and the contribution to these problems of past transportation policies. The ability of the poor to engage in economic activity is limited by inadequate transport facilities and services and is generally hindered rather than helped by current transportation policies. Urban growth is causing transport conditions for the urban poor to deteriorate, but a reorientation of the development of urban settlements is feasible, and such a reorientation, by placing less emphasis on the formal economy and central-area growth and more on the informal economy and dispersed growth, may reduce the need for travel while maintaining or increasing the opportunity for participation in economic activity and social life. Current rural transportation policy, oriented mainly towards the provision of rural trunk roads and feeder roads, often built to a high standard of design, is inappropriate and should be reformulated. The rural poor should be provided with essential access facilities and the development of appropriate vehicles for use both on and off the farm should be promoted. The urban poor have no option but to rely on walking, bicycles or some form of public transport. Current urban transportation policies, by focusing on highway investment, generally make travel conditions worse for the urban poor and reduce the range and quality of urban facilities available to them. Policies

relating to engineering works, traffic management and public transport operations should be modified so that an appropriate balance is struck between the transport requirements of different sections of the community. The transportation needs of those with limited means can only be satisfied through the development of appropriate planning procedures which place more emphasis on the collection of appropriate information, the development of expertise through practical experience, local participation and the co-ordination of agencies. (Author/TRRL)

Developing Countries. Proceedings of Seminar G held at the PTRC Summer Annual Meeting, University of Warwick, England, 4-7 July 1983.

Parker, GB *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* Volume P237, 1983, pp 299-319, Refs.

ACKNOWLEDGMENT: TRRL (IRRD 273967)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

41 382770

#### DEVELOPING A BALANCED PUBLIC TRANSPORTATION SYSTEM IN A MEDIUM SIZE CITY: A CASE STUDY OF SAUMUR (FRANCE)

Public transportation ridership is 57 trips/inh/year in Saumur compared with an average 32 trips/inh/year for cities of comparable size. This proves that the case of public transportation in small cities is not a lost one. The present paper aims at explaining the reasons for success and at presenting how demand was and is continuously assessed. If wanted, the selected technical solutions could be presented more extensively. The public transport system which was developed in several stages starting from 1978 answers to a double principle: an alternative involving public transport must exist for every trip within the urban area boundaries. This implies a diversification of services in time and space; specific solutions had to be devised for home-to-work trips and low-density areas. The public transport supply must be adapted permanently to the true needs of Saumur inhabitants. This implies a very flexible operation and the definition of processes which enable the management to "listen" to people's needs. There are however limits to this system. It requires people to receive a lot of information and be requested to participate in meetings. After four years, a phenomenon of "feeding-up" appears. There is also evidence that too much flexibility and then variability, may induce negative effects on people's confidence in the system and then willingness to patronize it. (Author/TRRL)

Public Transport Planning and Operation. Proceedings of Seminar L held at the PTRC 11th Summer Annual Meeting.

Dekkers, M-A (Irt) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* 1983, pp 43-54, 1 Fig., 6 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 273498)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

41 382781

#### CONSEQUENCES OF FISCAL REGULATIONS IN THE NETHERLANDS WITH REGARD TO BUSINESS AND COMMUTER TRAFFIC BY CAR [ENKELE GEVOLGEN VAN FISCALE REGELINGEN MET BETREKKING TOT HET ZAKELIJK PERSONENAUTOVERKEER EN HET WOON-WERK VERKEER]

It seems to be reasonable that the real user cost relating to business and commuter traffic by car should be subtracted from pre-tax income. However, the Dutch income tax regulations clearly overrate those real costs to the users. Consequently, the treasury is deprived of a considerable amount of taxes (more than 1500 million guilders a year), the post-tax cost of business traffic by car is very low or even negative to the users and public transport loses its competitive power in the market of business traffic. These conclusions are based on a series of realistic assumptions about car ownership, car-use, cost-and fiscal structure. Three regulations are discussed: (1) some 10 percent of all cars are company cars. If everything is paid for by the company, 20 percent of the new value of the car is considered to be a pre-tax income equivalent to free private use of the car. It is shown that this percentage does not meet the value of private use. Additionally: (2) a tax-free reimbursement, based on the integral cost is given by employers for some 10 percent of all car-kilometres (business-purposes). Consequently, the variable cost of those kilometres is negative to the user. (3) commuter traffic is still considered as cost to earn income, but



a lot of commuter traffic originates from the free choice to live outside the urban environment. Especially for the higher income groups there is no need to offer the fiscal facility to subtract commuting cost from pre-tax income. A reconsideration of fiscal regulations with regard to business and commuter traffic by car is advised. (TRRL) [Dutch]

Holtgreffe, AAI (Nv Nederlandse Spoorwegen) *Tijdschrift voor Vervoerswetenschap* Vol. 19 No. 3, 1983, pp 232-238, 1 Tab., 3 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273431), Institute for Road Safety Research SWOV

ORDER FROM: Netherlands Institute of Transport, Polakweg 13, 2288 GG Rijswijk, Netherlands

41 382794

**ROUTE CHOICE AND THE VALUE OF COMMUTING TIME: AN ECONOMIC MODEL OF DICHOTOMOUS CHOICE**

This paper presents an economic model of generalized travel cost and provides an empirical study of the parameters of the cost function. The route-choice model that is estimated combines McFadden's theory of qualitative choice behavior with a function for the value of travel time in which total trip time and the income level are assumed to influence the marginal value of time. The empirical results indicate that, for a sample of commuters in the Chicago metropolitan area in 1972, the value of time is a positive function of total trip time, but is not a function of income. (Author/TRRL)

McDonald, JF (Illinois University, Chicago Circle) *Transportation Research. Part B: Methodological* Vol. 17B No. 6, Dec. 1983, pp 463-470, 2 Tab., 19 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273761)

ORDER FROM: ESL

41 382795

**THE SOCIAL DIMENSION IN TRANSPORTATION ASSESSMENT**

This book begins by describing and pointing out the inadequacies in the evaluative frame of reference adopted by transportation planners on both sides of the Atlantic which has led to the expenditure of vast sums of money without the proper assessment of social implications, thus creating enormous problems. Potential sources and the generation of social information are then discussed, and some specific British and Canadian transport studies are compared. The final section of the book discusses the decision making implications of social information generation, as well as some further data sources for social assessment. (Author/TRRL)

Wilson, T (Cranfield Institute of Technology); Neff, C (Bedfordshire County Council)  
Gower Publishing Company Limited Monograph 1983, 339p, 2 Fig., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 273740)

ORDER FROM: Gower Publishing Company Limited, Gower House, Craft Road, Aldershot, Hampshire, England

41 382805

**BRAKPAN WHITE BUS SERVICE-PRELIMINARY INVESTIGATION**

Brakpan municipality was concerned about the deteriorating financial position of its white bus service. An on-bus survey was carried out to provide information as to how well the service was meeting the needs of existing users. Estimates of potential demand were obtained from mail-back questionnaires sent to all households. The surveys revealed that schoolchildren formed 81 per cent of the ridership and that only 3 per cent of the workers travelled by bus. The majority of workers were employed outside Brakpan, mainly in other East Rand towns. Many educational and shopping journeys were also made to destinations outside Brakpan. Due to the wider implications of the substantial cross-boundary movements, the report recommends that a major service revision be left until it can be planned and developed on a metropolitan basis. Other recommendations cover minor service changes, formal liaison with schools, and how to conduct future surveys. (TRRL)

Smith, RA

National Institute for Transport & Rd Res, S Af Monograph RT/33/82, Nov. 1982, 22p, 5 Fig., 17 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 273787)

ORDER FROM: National Institute for Transport & Rd Res, S Af, P.O. Box 395, Pretoria 0001, Transvaal, South Africa

41 382839

**COMMUTING PATTERNS IN EUROPE: AN OVERVIEW OF THE LITERATURE**

This report summarizes a study carried out by TRRL on behalf of the European Foundation for the Improvement of Living and Working conditions. That study reviews research on commuting and on its consequences in all member countries of the European community. This report contains a description of basic commuting patterns and of the policies that are concerned with commuting in each member country, noting where similarities and differences occur. It examines research on the processes involved in modal and residential choice, to show how the present pattern of commuting has evolved and how people respond to change. The report also examines the social consequences of commuting, looking at its effects on community structure and social and family life, and particular attention is paid to the effects of long and difficult journeys on behaviour at home or in the workplace. This report only covers the major findings of the study, and a comprehensive treatment of the subject and a bibliography will be found in the full report-A European Study of Commuting and Its Consequences, published by the European Foundation for the Improvement of Living and Working Conditions, Dublin 1983. (Author/TRRL)

Pickup, L Town, SW

Transport and Road Research Laboratory, (0305-1315) SR 796, 1983, 27p, 5 Fig., 7 Tab., 39 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273249)

ORDER FROM: TRRL

41 382850

**ATTITUDES OF YOUNG PEOPLE TO TRANSPORT PROBLEMS AND ENVIRONMENTAL ISSUES**

Recent discussions on environmental problems showed that environmental protection is to be seen in close reciprocal relation to other values, within this system of values the attitudes to transport modes and the use of its facilities are central issues. In order to get empirical material on these hypothetical connections the Daimler-Benz Company initiated a representative survey about the "attitudes of the young generation to environmental problems". The results of the survey are presented:-a typical pattern of attitudes representing the younger generation could not be found; but there are special patterns leading to different minority attitudes. -the intentions of younger people to own and use a car or a motorbike seem to be more stable than was believed;-the acceptance of reducing motorized individual transportation modes because of ecological reasons could be found for a minority. Increasing the level of restriction-driving a smaller car/driving slowly/renunciation of using cars in cities/general renunciation of car use-means less acceptance of the proposed measures;-bicycle and pedestrian traffic are judged positively in all groups;-the importance of individual transportation is indicated by the attitude towards future road and highway development: 70% of the young adults would favour extension of roads and highways. It is concluded that:-the range of environmental attitudes shows a trend towards individual transport modes even in the younger generation;-the attitudes of young adults to mobility and transportation cannot be described in one pattern;-the mentioned attitudes must be seen in connection with corresponding personal attitudes and behaviour to environmental problems;-results about the stability of attitudes and its influence on behavioural patterns cannot be figured out in the case of an isolated survey. (TRRL)

Transport Planning Methods. Proceedings of Seminar N held at the PTRC Summer Annual Meeting, University of Sussex, England, 4-7 July 1983.

Mattrisch, G Waschke, T (Daimler-Benz AG) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P243*, 1983, pp 83-92, 3 Fig., 10 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273140)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

41 384582

**LEISURE-TIME JOURNEYS [FRITIDSREISER]**

The report deals with leisure-time journeys, that is, everyday life journeys, including weekend travels, but not longer holiday travels. The following aspects are included: problems in question, organized leisure-time activities, amusements, trips, and private visits. The aim is to present the main tendencies in the material resulting from a nation-wide interview investigation performed in 1980. (TRRL) [Norwegian]

Houg, T Gundersen, H *Transport og Velferd* No. 4, 1982, 12p, 4 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 274465), Norwegian State Highway Laboratory

ORDER FROM: Institutt for Samfunnsforskning, Munthesgt 31, N-Oslo 2, Norway

41 384583

**JOURNEYS TO FAMILY AND FRIENDS [VENNEREISER]**

The report deals with conditions concerning visits to family and friends, and the aim is to present the main tendencies in the material resulting from a nation-wide interview investigation performed in 1980. A later, larger report will present the analysis of these connections in greater detail. (TRRL) [Norwegian]

Houg, T Gundersen, H *Transport og Velferd* No. 3, 1982, 20p, 4 Fig., 4 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 274464), Norwegian State Highway Laboratory

ORDER FROM: Institutt for Samfunnsforskning, Munthesgt 31, N-Oslo 2, Norway

41 384584

**SHOPPING TRAVELS [INNKJOEPSREISER]**

The report deals with travel in connection with daily shopping. The importance of shopping in relation to the other activities of everyday life is also examined. The aim is to present the main trends in the material resulting from a nation-wide interview investigation performed in 1980. It deals with the following aspects: ways of looking at the problems, shopping journeys, course of action, alternatives to going by car (to walk, to cycle, public transport), and attitudes to shopping journeys. (TRRL) [Norwegian]

Houg, T Gundersen, H *Transport og Velferd* No. 2, 1982, 19p, 4 Fig., 2 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 274463), Norwegian State Highway Laboratory

ORDER FROM: Institutt for Samfunnsforskning, Munthesgt 31, N-Oslo 2, Norway

41 384585

**JOURNEYS TO WORK [ARBEIDSREISER]**

The report deals with conditions concerning journeys to work. The aim is to present some main tendencies in the material resulting from a nation-wide interview investigation performed in 1980. Presented here are relationships between important background information such as income, age, sex, and kind of local community, as well as information about distance to work, journeys during the working hours, and the possibility of alternative means of transport. A later, larger report will present the analysis of these relationships in greater detail. (TRRL) [Norwegian]

Houg, T Gundersen, H *Transport og Velferd* No. 1, 1982, 19p, 3 Fig., 3 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 274462), Norwegian State Highway Laboratory

ORDER FROM: Institutt for Samfunnsforskning, Munthesgt 31, N-Oslo 2, Norway

41 384587

**A CONTINUOUS ANALYSIS OF THE ROLE OF TRANSPORTATION AND CROWDING COSTS IN DETERMINING TRIP DISTRIBUTION AND LOCATION IN A LINEAR CITY**

The aim of this paper is to evaluate the effect that crowding and transportation costs have on trip distribution and, as a consequence, location. This is achieved by using continuous methods to find the trip

distribution in a linear town that results from various assumptions. Three alternative criteria are used to determine the trip distribution, namely: individual cost minimization, equity of cost and global minimization of cost. Both the constrained and unconstrained problems are treated. In most cases many trip distributions may be found which satisfy the various criteria, assumptions and constraints. However, if the trip distribution is chosen from a specific family, then unique trip distributions follow as is the case if a utility constraint is added to the problem. (Author/TRRL)

Vaughan, R

Newcastle University, Australia 1983, 34p, 5 Fig., 3 Tab., 11 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 266681), Australian Road Research Board

ORDER FROM: Newcastle University, Australia, Department of Mathematics, Statistics and Computer Science, Newcastle, New South Wales, Australia

41 384588

**WALKING [AA GAA]**

The report deals with various aspects of walking: problems with walking, walking as a transport mode, and pedestrians in today's traffic. It presents connections between important background data as income, age, sex, kinds of local communities, and information about walking. The aim is to present the main tendencies in the material resulting from a nation-wide interview investigation performed in 1980. (TRRL) [Norwegian]

Houg, T Gundersen, T *Transport og Velferd* No. 5, 1982, 12p, 4 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 274466), Norwegian State Highway Laboratory

ORDER FROM: Institutt for Samfunnsforskning, Munthesgt 31, N-Oslo 2, Norway

41 384589

**CYCLING AND USING CHAIR SLEDGE [AA SYKLE OG AA BRUKE SPARK]**

The report deals with the use of bicycle and chair sledge, and considers the following aspects: problems in question, use of bicycle and chair sledge, possibilities of replacing cycling with other transport modes, problems with cycling, and children cycling. The aim is to present the main tendencies in the material resulting from a nation-wide interview investigation performed in 1980. (TRRL) [Norwegian]

Houg, T *Transport og Velferd* No. 6, 1982, 15p, 3 Fig., 3 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 274467), Norwegian State Highway Laboratory

ORDER FROM: Institutt for Samfunnsforskning, Munthesgt 31, N-Oslo 2, Norway

41 384590

**PUBLIC TRANSPORT [KOLLEKTIVTRANSPORT]**

The report deals with conditions concerning public transport, and the aim is to present the main tendencies in the material resulting from a nation-wide interview investigation performed in 1980. It considers the following aspects: problems in question, the public transport as such, and the use of the collective means of transport. (TRRL) [Norwegian]

Houg, T Gundersen, H *Transport og Velferd* No. 7, 1982, 15p, 4 Fig., 1 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 274468), Norwegian State Highway Laboratory

ORDER FROM: Institutt for Samfunnsforskning, Munthesgt 31, N-Oslo 2, Norway

41 384591

**USE OF CARS [BILBRUK]**

The report deals with conditions concerning use of cars. It presents the connections between important background material such as income, age, sex, local community conditions, and use of car for daily tasks. It also considers use of cars as such, as well as the development of private motoring. The aim is to present the main tendencies in the material resulting from a nation-wide interview investigation performed in 1980. (TRRL) [Norwegian]

Houg, T Gundersen, H *Transport og Velferd* No. 8, 1982, 16p, 4 Fig., 2 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 274469), Norwegian State Highway Laboratory

ORDER FROM: Institutt for Samfunnsforskning, Munthesgt 31, N-Osle 2, Norway

41 384592

#### CHILDREN IN THE TRAFFIC [BARN I TRAFIKKEN]

This report about children in traffic is based on interviews with parents and guardians forming a representative selection of 515 children. It deals with the transport needs of children, everyday journeys of children, social differences, fear and insecurity, as well as goals for a transport policy favourable to children. The aim is to present the main tendencies in the material resulting from a nation-wide interview investigation performed in 1980. (TRRL) [Norwegian]

Houg, T Gundersen, H *Transport og Velferd* No. 10, 1982, 14p, 4 Fig., 1 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 274471), Norwegian State Highway Laboratory

ORDER FROM: Institutt for Samfunnsforskning, Munthesgt 31, N-Oslo 2, Norway

41 384593

#### TRANSPORT IN SPARSELY POPULATED AREAS [TRANSPORT I UTKANTSTROEK]

The report elucidates the means of transport available for people living in sparsely populated areas. It is based on a comparison between 3 different groups of the population: (1) a representative nation-wide group, (2) a part of this first group living in the urban area of Oslo, and (3) an additional selection to the first group from five local authorities (rural, coastal, industrial, others) called sparsely populated. It deals with organized leisure-time activities, amusements, trips, and private visits. The aim is to present the main tendencies in the material resulting from a nation-wide interview investigation performed in 1980. (TRRL) [Norwegian]

Houg, T Gundersen, T *Transport og Velferd* No. 9, 1982, 12p, 4 Fig., 2 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 274470), Norwegian State Highway Laboratory

ORDER FROM: Institutt for Samfunnsforskning, Munthesgt 31, N-Oslo 2, Norway

41 384599

#### ACCESSIBILITY TO EMPLOYMENT IN SELECTED AREAS OF LONDON: A REVIEW AND PRESENTATION OF SOME INTERIM RESULTS

An attempt is being made to contribute to a framework and methodology for understanding the changing patterns of work trips in Greater London and to examine the effects of varying levels of accessibility on various types of job opportunity. The project focusses on four relatively small areas within the greater London transportation survey area, although London-wide analyses of a few of the variables studied also form part of the work. A number of data sources, principally the Greater London Transportation Survey (1971), the censuses of population (1961, 1966 and 1971) and the London traffic survey (1962), are being examined to establish the patterns of and trends in work trips from and to these areas. A high degree of disaggregation of resident populations and workforces is an essential part of the analysis. This note briefly reviews similar work, outlines the methods used in the research, describes the results of work already carried out and discusses the future development of the project. (Author/TRRL)

Mowforth, M  
University College, London Monograph Aug. 1982, 26p, 4 Fig., Tabs., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 274515)

ORDER FROM: University College, London, Gower Street, London WC1E 6BT, England

41 384602

#### COST BENEFIT ANALYSIS AND LONDON'S TRANSPORT POLICIES

This study selects and examines certain policy changes in order to provide insights into the significance of social cost benefit analysis in justifying alternative levels of output to be achieved by the London Transport Executive. The results are presented of four types of case study: 1, A global evaluation of fare and service changes in buses and underground, viewing these activities as a whole; 2, Separate closure of three underground stations; 3, Change of service levels in two underground lines (Jubilee and Victoria); and 4, Substantial change in service provided by certain bus routes, selected for their variability in results. (TRRL)

Beesley, ME Gist, P Glaister, S (London Business School & London Sch of Economics) *Progress in Planning* V19 PT3, 1983, 100p, Tabs., 13 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 274572)

ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

41 384603

#### ACCESSIBILITY TO EMPLOYMENT IN SELECTED AREAS OF LONDON: AIMS, DEFINITIONS, CONCEPTUAL PROBLEMS AND METHODS

An attempt is being made to contribute to a framework and methodology for understanding the changing patterns of work trips in greater London, and to examine the effects of varying levels of accessibility on various types of job opportunity. Aspects considered at length include: the location of employment; generalised costs; accessibility; and employment opportunity. Various conceptual and theoretical problems relating to the work are then discussed, and the methods used in the research are summarised. (TRRL)

Mowforth, M  
University College, London Monograph Aug. 1982, 33p, 3 Fig., 11 Tab., 32 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 274573)

ORDER FROM: University College, London, Transport Studies Group, Gower Street, London WC1E 6BT, England

41 384620

#### TRANSPORTATION AND WELFARE [TRANSPORT OG VELFERD]

This is the general report in the series "Transport og Velferd" (Transportation and Welfare). The series aims at presenting information about the connections between tasks and transport for various groups in the society. Usually traffic surveys are concerned with journeys to work only, but this series assumes that all groups have a certain need for taking part in activities placed at a distance from their residences. Non-working persons, too, have such needs, and the series therefore also deals with shopping journeys, private visits, and leisure-time activities, as well as journeys to work. Separate reports deal with children and handicapped persons. Other reports have the transport mode as their basis, and deal with use of cars, cycling, use of chair sledge, public transport, and walking. (TRRL) [Norwegian]

Houg, T Gundersen, H *Transport og Velferd* No. 13, 1982, 44p, 44 Fig., 1 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 274474), Norwegian State Highway Laboratory

ORDER FROM: Institutt for Samfunnsforskning, Munthesgt 31, N-Oslo 2, Norway

41 384632

#### COSTS AND BENEFITS OF REGIONAL PUBLIC TRANSPORT [KOSTEN UND NUTZEN DES REGIONALEN OEFFENTLICHEN VERKEHRS]

At canton level, the author tries to define decision-making criteria for the implementation of regional public transport systems in conformity with the community's interest. [German]

Boos, E  
Haupt (Paul) 1983, 411p, 14 Tab., 49 Phot., 10 Ref., 5 App.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: Haupt (Paul), Bern, Switzerland

41 384637

**COMMUTER TRAVEL [LES DEPLACEMENTS DOMICILE-TRAVAIL]**

This bibliographical analysis shows the amount of time and expense involved in travel to work. Extensive research has been carried out on commuter flows, yet information is lacking on interactions between life at work, daily life and travel to work. [French]

Coindet, JP Potier, F Note d'Information l'Institut de Recher des Transp No. 25, Apr. 1983, 80p, 10 Fig., 10 Tab., 44 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Institute of Transport Research, Avenue du General Malleret-Joinville, Boite Postale 28, 94 Arcueil, France

41 384666

**THE IMPACT OF CHANGING WOMEN'S ROLES ON TRANSPORTATION NEEDS AND USAGE. EXECUTIVE SUMMARY**

This study explores the impacts of changing women's roles on transportation needs and usage. Particular attention was directed to the rapid increase of female participation in the workforce and the growing number of female-headed households with children. Data for analysis were drawn from a 1980 survey of families in Toronto, Canada and compared with similar data from a 1976 study of travel behavior in Orange County, California. Six specific travel issues were addressed: emerging roles of women which accounted for new travel patterns and demands; differences between travel-patterns of men and women; objective factors affecting women's travel conditions; personal consequences arising from women's travel conditions; travel implications of practices and facilities designed to facilitate women's emerging roles; and the generalizability of Canadian data to the dynamics of women's travel in American cities. Women's travel patterns were found to be significantly influenced by a number of factors including income, employment and marital status, and presence and age of children in the household. Men's and women's travel patterns differed significantly, as did women's travel patterns in the two geographic areas studied. Results indicated that changes in the social infrastructure, including childcare facility, work schedules, and hours of public service facilities (i.e., banks) will be required to ameliorate women's difficulty in scheduling daily activities.

Michelson, W  
California University, Irvine, Urban Mass Transportation  
Administration Final Rpt. UMTA-CA.11-0024-84-1, Sept. 1983,  
8p Contract UMTA-CA-11-0024  
ORDER FROM: NTIS PB84-182583

41 384667

**THE IMPACT OF CHANGING WOMEN'S ROLES ON TRANSPORTATION NEEDS AND USAGE**

This study explores the impacts of changing women's roles on transportation needs and usage. Particular attention was directed to the rapid increase of female participation in the workforce and the growing number of female-headed households with children. Data for analysis were drawn from a 1980 survey of families in Toronto, Canada and compared with similar data from a 1976 study of travel behavior in Orange County, California. Six

specific travel issues were addressed: emerging roles of women which accounted for new travel patterns and demands; differences between travel patterns of men and women; objective factors affecting women's travel conditions; personal consequences arising from women's travel conditions; travel implications of practices and facilities designed to facilitate women's emerging roles; and the generalizability of Canadian data to the dynamics of women's travel in American cities. Women's travel patterns were found to be significantly influenced by a number of factors including income, employment and marital status, and presence and age of children in the household. Men's and women's travel patterns differed significantly, as did women's travel patterns in the two geographic areas studied. Results indicated that changes in the social infrastructure, including childcare facility, work schedules, and hours of public service facilities (i.e., banks) will be required to ameliorate women's difficulty in scheduling daily activities.

Michelson, W  
California University, Irvine, Urban Mass Transportation  
Administration Final Rpt UMTA-CA-11-0024-84-1, Sept. 1983, 121p,  
1 Fig., 32 Tab., Refs., 1 App. Contract UMTA-CA-11-0024  
ORDER FROM: NTIS PB84-182591

41 384892

**TRAVEL PATTERNS AND TRANSIT NEEDS OF WOMEN. VOLUME 1**

The objective was to identify women's travel patterns and determine whether, and to what degree, the transportation needs of women are being met by the existing transit systems. The scope of the study provided for a survey of women in five geographically dispersed cities (Atlanta GA, Chicago IL, New Orleans LA, Seattle WA, and Washington DC), and site visits to transportation planning organizations/systems at each of the cities. One of the study's significant observation was the general lack of data on women's transit use, including specific information on trip purpose, time of travel, socioeconomic profiles, special needs and consumer satisfaction.

See also PB84-139724.

Moore, CB  
Moore-Johnson, Incorporated, Urban Mass Transportation  
Administration Final Rpt. MOOREJOHNSON4102VOL1, UMTA-DC-06-0282-83-1, Sept. 1982, 107p

ORDER FROM: NTIS PB84-139716

41 384893

**TRAVEL PATTERNS AND TRANSIT NEEDS FOR WOMEN. VOLUME 2. APPENDICES A THROUGH E**

The objective was to identify women's travel patterns and determine whether, and to what degree, the transportation needs of women are being met by the existing transit systems. Volume 2 contains the appendices, the bibliography, survey instruments, profiles of transit services in each of the study sites and a review of the current title VI regulations.

Moore, CB  
Moore-Johnson, Incorporated Final Rpt.  
MOOREJOHNSON4102VOL2, UMTA-DC-06-0282-83-2, Sept. 1982,  
193p

ORDER FROM: NTIS

42 371847

**STATEWIDE TRANSPORTATION PLANNING: MONITORING**

Although massive data-collection efforts can no longer be financially justified in most instances, the need for adequate data and information has not ceased—for forecasting, for understanding, for monitoring, for program development...The focus of this issue of the Statewide Transportation Planning Newsletter is on monitoring methods, activities, and uses, for once data and information are assembled, it is important that they be used effectively by as many groups, programs, and agencies as possible. "Effective use of resources" is a phrase that applies to transportation monitoring activities as well as to the use of transportation facilities. (Author)

Creighton, RL (Creighton (Roger) Associates, Incorporated)  
Transportation Research Circular No. 253, HS-035 202, Jan. 1983, 4p

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42 380149

**RAPID TRANSIT CORRIDOR CONCEPTS STUDY**

With the 6.4-mile light rail rapid transit (LRRT) line under construction northeast from downtown Buffalo, Niagara Frontier Transportation Committee undertook a study to define priority corridors for further transit development. The corridors and transit alternatives for serving them were examined in terms of operating characteristics and ridership. Cost estimates were developed using a 2-step process involving a definition of alignment for each concept and capital requirements for construction, stations and maintenance. Final analysis evaluated the various corridor concepts by adding each of the composite network improvements individually to the base transit system, evaluating what impact a particular improvement in each corridor would have upon the regional network. It was first recommended that transit improvements maximize the benefits of the truncated LRRT under construction and that completion of its full length is a desirable objective. Phase II studies should then concentrate on two northward extensions from the LRRT, a transit mode be selected for service to the southside, and in 3 to 5 years corridors be defined to the east and southwest.

Niagara Frontier Transportation Committee Tech Rpt. UMTA-NY-09-0043, Apr. 1983, 181p, 25 Fig., 29 Tab.

ORDER FROM: Niagara Frontier Transportation Committee, 181  
Ellicott Street, P.O. Box 5008, Buffalo, New York, 14203

42 380153

**GETTING RESULTS FROM TSM PLANNING: BALTIMORE'S CORRIDOR STUDY APPROACH**

A series of transportation system management (TSM) corridor studies was performed in the Baltimore region in conjunction with 1982 transportation control plan (TCP) activities. The primary objective of the studies was to identify specific implementable TSM actions that could improve the performance of the transportation system and reduce automobile emissions and energy consumption. A total of 27 corridors were initially selected for study, of which 7 were completed in preparation of the TCP. A detailed analytic and management approach was developed in order to conduct each corridor study efficiently. Continuing technical and policy guidance was provided by a project management committee consisting of federal, state, and local agency personnel. Public participation was also a major element of the process and provided valuable insight into local transportation concerns. A wide variety of TSM actions was considered, including traffic operations, transit programs, ridesharing, parking management, commercial vehicle programs, and bicycle and pedestrian programs. Each alternative action was evaluated by using several measures of effectiveness. The recommended TSM actions, with responsibilities specified, were grouped into packages as part of the implementation plan. The recommended TSM actions were found to be effective in meeting the project objectives, contributing significantly to the improvement of transportation services and the environment. Finally, the study process was determined to be transferable to other corridors in the region and has since been used for additional TSM studies.

This paper appeared in Transportation Research Record No. 906, Urban Traffic Systems.

Samdahl, DR (JHK and Associates); Reightler, J Lippman, SS  
(Baltimore Regional Planning Council) Transportation Research  
Record No. 906, 1983, pp 18-26, 5 Fig., 4 Tab., 14 Ref.

ORDER FROM: TRB Publications Off DOTL JC

42 380167

**MONTGOMERY COUNTY PENNSYLVANIA TURNPIKE BUS STUDY**

The portions of the Pennsylvania Turnpike and US 202 Expressway which run circumferentially around Philadelphia through its outer suburbs are approaching saturation because of the large volume of local traffic. As an alternative to Turnpike widening, the establishment of fixed-route transit service connecting the residential, employment and shopping centers along this corridor was investigated. The study recommended a level of public transit service appropriate for implementation based on financial resources and demands. This involved study of demand for bus service and evaluation of park-and-ride facilities that would enable present and projected Turnpike users to have an alternative to driving. Two existing bus routes covering segments of the corridor could be rerouted on the Turnpike/Expressway and would operate viably while serving to reduce traffic congestion of the roads involved.

Delaware Valley Regional Planning Commission UMTA-PA-09-0007,  
May 1983, 89p, 11 Fig., 28 Tab., 1 App.

ORDER FROM: Delaware Valley Regional Planning Commission,  
Bourse Building, 21 South 5th Street, Philadelphia, Pennsylvania,  
19106

42 380195

**SB 283 (1975) INNOVATIVE PUBLIC TRANSPORTATION DEMONSTRATION PROGRAM: SYNOPSES OF PROJECT EVALUATIONS**

This report presents synopses of project evaluations for 44 public transportation demonstration projects sponsored by the California Department of Transportation between 1977 and 1981. A few examples of the types of projects funded are demonstrations of the "brokering" concept for social service agencies, providing transportation for the E&H, demonstrating organized "hitchhiking", development of transit marketing programs, development of driver training courses, development of an introduction to transit for school children, development of a bus-ferry transfer system, and demonstrating an automatic passenger counter program.

Hollinden, A  
California Department of Public Works, California University, Irvine,  
Urban Mass Transportation Administration Final Rpt. DMT-115,  
UMTA-CA/MT-83/115, Mar. 1983, 135p Contract DOTUMTA-CA-  
09-8005/6

ORDER FROM: NTIS PB83-245308

42 380226

**THE SOFRETU AND RATP EXPERIENCE AS REGARDS THE TRANSFER OF KNOW-HOW**

SOFRETU, a subsidiary of the RATP, has since its creation just over 20 years ago been actively involved in the design and building of over ten metro systems throughout the world. Each contract has meant transfers of know-how by SOFRETU to varying degrees. After having briefly recalled SOFRETU's range of activities and the importance which the building of a metro system represents for the community as a whole, the author describes the methodology and choice of solutions adopted by SOFRETU for this transfer of know-how, followed by a brief review of some of the operations recently carried out in this sphere.

Jeux, A *Revue Generale des Chemins de Fer* Vol. 102 July 1983, pp  
408-412

ACKNOWLEDGMENT: British Railways

ORDER FROM: ESL

42 380783

**CHARACTERISTICS OF URBAN TRANSPORTATION SYSTEMS. A SKETCH-PLANNING REFERENCE FOR TRANSPORTATION PLANNERS**

This document is to provide a single source of sketch planning data on the most important performance characteristics of four contemporary urban transportation systems—rail, bus, highway-automobile and mixed mode, and pedestrian assistance systems in a format that lends itself to easy reference. A fifth mode, the activity center system (people movers at airports and amusement parks) has been added. Passenger demand is not dealt with, only the supply or performance characteristics of urban

transportation systems. The seven supply parameters are speed, capacity, operating cost, energy consumption, pollution, capital cost, and accident frequency. Level of detail is sufficient for sketch planning—the preliminary screening of possible transportation configurations or concepts. Completion of an analysis will require data more specific and current than can be included here. More refined estimates must be obtained by reviewing current bids and in discussions with vendors. Each mode is treated in its own chapter. Parameters are discussed at several levels—default range (usually a mean or median value), range of values (high and low for sensitivity analysis), and theoretical range.

Comsis Corporation, Urban Mass Transportation Administration Aug. 1983, v.p., Tabs., 8 App.

ORDER FROM: UMTA

#### 42 380794

##### LIGHT RAIL TRANSIT IN VANCOUVER—COSTS, POTENTIAL AND ALTERNATIVES

While some stories in the media indicate that Light Rail Transit is the easy answer to transit problems in major metropolitan areas, some experts are far from convinced. There are good reasons to believe that other systems may be much better suited for some metropolitan areas—and far less expensive. This study looks at LRT in Vancouver and potential alternatives. It considers who would pay for the system, who would use it and who would benefit.

Poulton, MC  
British Columbia University, Canada No Date, 143p

ORDER FROM: British Columbia University, Canada, Centre for Transportation Studies, Vancouver V6T 1W5, British Columbia, Canada

#### 42 380798

##### THE DOWNTOWN HARTFORD TRANSPORTATION PROJECT: PUBLIC/PRIVATE COLLABORATION ON TRANSPORTATION IMPROVEMENTS

This report illustrates how a major transportation project undertaken to accommodate/unprecedented levels of building and employment growth can simultaneously contribute to objectives of the Clean Air Act. The goal was triggering implementation of a comprehensive program of actions to address Hartford's anticipated downtown transportation problems, looking at all components as an interactive system—traffic, parking, transit, pedestrian flow and goods delivery. Involved were physical projects such as traffic signal synchronization, management actions such as peak-hour parking restrictions, and policy tools such as requiring transportation access plans for new development. Both public and private sectors became involved in this transportation planning process, each providing half of the \$300,000 required. While it was anticipated that work trips would increase by 23% over 3 years, the steps suggested were to increase the share by transit and ridesharing from 52% to 61%, produce an increase in short-term parking spaces and improve air quality. No major infrastructure expansion was required and greater public/private/cooperation was fostered.

Cambridge Systematics, Incorporated, Connecticut Department of Transportation UMTA-CT-09-0004, July 1983, 39p, 11 Ref. Contract CT-19-0004

ORDER FROM: Cambridge Systematics, Incorporated, 238 Main Street, Cambridge, Massachusetts, 02142

#### 42 380832

##### MATHEMATICAL TECHNIQUES FOR ESTIMATION OF THE VALUE OF TRAVEL TIME SAVINGS: A REVIEW

A decrease in travel time is usually one of the benefits resulting from improvements to a transportation system. For cost benefit analysis of project proposals it is necessary to estimate the value of travel time savings. Methodologies which may be used for this purpose are reviewed with the aim of comparing the assumptions and limitations of the formulations and solution techniques used. The methodologies are divided into aggregate and disaggregate models. The aggregate models discussed are the gravity, entropy and abstract mode models. These are limited by their restricted behavioural basis and use of data describing zonal and inter-zonal characteristics. Any values produced by these models are calculated at the mean of the sample. The many disaggregate models are mostly based upon

theories of individual decision making behaviour. The models are divided into simple, multinomial, general behavioural and functional measurement models. When applying any model the sources of error, aggregation of disaggregate results and the updating and transfer of results should be considered. Each of these issues and the precautions which may be taken, are discussed. The desirable properties of models for estimating the value of travel time savings are listed and used to compare the models reviewed. None of the models has all the properties, but functional measurement comes closest. For situations in which aggregate results are acceptable the elimination-by- aspects and satisfying models should be considered. (TRRL)

King, GW  
Australian Government Publishing Service Monograph Occasional Paper 57, 1983, 55p, 6 Fig., 2 Tab., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 266486), Australian Road Research Board

ORDER FROM: Australian Government Publishing Service, 109 Canberra Avenue, Griffith, A.C.T., Australia

#### 42 380834

##### A SCENARIO WITHOUT A CAR [SCENARIO ZONDER AUTO]

Szalai's study on time budgets in 1965/66 led to the conclusion that the average time spent by West-Europeans and Americans on travelling was 74 minutes per day. A study in the Netherlands in 1975 showed an average of 65 minutes. Car ownership by then had increased considerably over the level in some West-European countries ten years before. The annual travel behaviour studies in the Netherlands give details of travel times per degree of urbanisation. The average travel time varies between 54 and 60 minutes and the distance covered lies between 20 and 28 kms. What would happen if the journeys had to be made by public transport instead of by car? The author calculated the loss of time to be some 30 minutes per capita. Taking travel time as being fixed, mobility would decrease by 54%. (TRRL) [Dutch]

Walta, W (Dienst Verkeerskunde) Verkeerskunde Vol. 34 No. 6, June 1983, pp 287-291, 3 Fig., 10 Tab., 15 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 270648), Institute for Road Safety Research SWOV

ORDER FROM: Royal Dutch Touring Club ANWB, Wassenaarseweg 220, P.O. Box 93200, The Hague, Netherlands

#### 42 380845

##### EFFICIENT AND COMPREHENSIVE PROCESS FOR IDENTIFYING ROADWAY AND TRANSIT NEEDS WITHIN URBAN AREAS

This paper provides an overview of an efficient and comprehensive process which can be utilized by provinces and municipalities outside Alberta to assess short and long-term roadway and public transit capital and operating maintenance requirements, and establish priorities for major transportation expenditures. This process was utilized by Alberta transportation in a four to five month time period in the 1981/82 year to assist in establishing new provincial urban transportation funding policies and programs. This paper outlines the two principal means of investigation used during the overall urban transportation program review, and provides an overview of the major components of the review. (Author/TRRL)

Proceedings of the 1982 Roads and Transportation Association of Canada Conference, Halifax, Nova Scotia, September 1982.

Lambert, WG (Alberta Transportation)  
Roads and Transportation Association of Canada Proceeding Sept. 1982, 31p, 3 Fig., 10 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 270871), Roads and Transportation Association of Canada

ORDER FROM: Roads and Transportation Association of Canada, 1765 St Laurent Boulevard, Ottawa, Ontario K1G 3V4, Canada

#### 42 380854

##### THE FUTURE OF URBAN PASSENGER TRANSPORT: A DELPHI SURVEY

This Delphi survey was conducted in conjunction with the Bureau of Transport Economics workshop on the future of urban public transport in Australia. The workshop, which formed part of the BTE's transport outlook series, was held in Canberra on 12-13 May 1981. Selected results

were reported in the workshop summary report published in June 1981 (BTE 1981) (IRRD no 255274). The purpose of the survey was twofold: 1) to examine views on a range of topics dealing with urban passenger transport, and to analyse how these views were modified as the workshop and the Delphi survey progressed; and 2) to test the Delphi survey as an analytical tool that may be useful in research work which involves handling uncertain future events. The report encompasses both these aspects. First, it reports on the outcome of the survey, analyses the movements from one round to the next, and draws conclusions on possible future outcomes based on this analysis. Second, it reports on the methodological aspects of the survey, including comments on the procedures used, the analytical tools employed and suggestions on ways of improving the application of the Delphi technique. (TRRL)

Australian Government Publishing Service, Bureau of Transport Economics, Australia Monograph Occasional Paper 52, 1982, 91p, 50 Fig., 15 Tab., 16 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 266457), Australian Road Research Board  
ORDER FROM: Australian Government Publishing Service, 109 Canberra Avenue, Griffith, A.C.T., Australia

42 380856

#### URBAN STRUCTURE AND TRANSPORTATION: THE AUSTRALIAN SCENE

Fixed and mobile portions of the Australian urban transport system are delineated with discussion of their functional effectiveness under various conditions. Trends in the shift of the transport task, from the public to the private sector are brought out in parametric form and projected into the future. Some comparisons are made with European cities, where recent trends have been towards substantial projects using electric traction, generally with steel wheels on steel rails. The organisational patchwork which characterizes our approach to the planning, structuring and management of the total urban transport system is reviewed. Illustrations are given of the anomalies which arise from this approach together with a prognosis of where management-by-default will lead us. Monetary and resource costs of certain options are highlighted. Energy conversion and traction efficiencies of current and future urban transport modes are discussed together with the relevant energy vectors. Local, regional and global environmental considerations are briefly mentioned; a condensed specification for an almost silent, pollution free, private urban vehicle is given. In conclusion, some future options which are now available to Australian cities are presented. An outline of a possible organisational structure is offered in a time frame which would make effective planning of a truly integrated system possible and give some hope of an effective decision making machinery and operational management in the decades ahead. (Author/TRRL)

Penzias, W  
New South Wales Institute of Technology Tech Rpt. NSWIT/ME-13, Jan. 1982, 43p, 10 Fig., 9 Tab., 55 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 266490), Australian Road Research Board  
ORDER FROM: New South Wales Institute of Technology, School of Mechanical Engineering, P.O. Box 123, Broadway, New South Wales, Australia

42 380877

#### ALTERNATIVE MODELLING PROCEDURES IN STUDIES OF TRAVEL MODE CHOICE: A REVIEW AND APPRAISAL

A question often asked of modellers is "does it really make a difference to the final result whether you use technique A or B or C?" a common response is "I think so but I have not made the comparisons; however it can be argued on theoretical grounds that technique b is likely to be superior." This paper documents the theoretical merits of seven econometric model forms and explores the empirical differences among them using a well-specified set of explanatory variables associated with the mode-choice decision for a cross-section of Sydney commuters. The empirical results suggest that the standard goodness-of-fit criteria (t-values, prediction success and elasticities) provide an inadequate basis for selecting a modelling procedure from a set of non-nested models which are estimated using different statistical methods (i.e. Ols and mle). Simplified models are also a dangerous mechanism for screening explanatory variables for inclusion/exclusion in more appropriate models. There is a need for

research to establish other criteria and tests for selection of a model form. (Author/TRRL)

Hensher, DA Johnson, LW (Macquarie University, Australia)  
*Transportation Planning and Technology* Vol. 8 No. 3, 1983, pp 203-216, 4 Tab., 29 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 271207)  
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42 380893

#### STRUCTURAL AND TRANSPORT POLICY PRINCIPLES FOR AN INTEGRATED PUBLIC TRANSPORT SYSTEM IN HAMBURG [STRUKTURELLE UND VERKEHRSPOLITISCHE GRUNDSATZUE FUER EIN INTEGRIERTES NAHVERKEHRSSYSTEM IN HAMBURG]

Details are given of Hamburg traffic area and of the development model for Hamburg and its surrounding area, which is based on the following classification concepts: the axis concept, main transport network system, central location system, and density model. As a supplement to the development model "guidelines for local public transport in Hamburg" were issued in 1969. The principles behind the guidelines and the development model are those of a spatial structural division based on a system of concentric zones around the city centre. The limited-stop tram system is the main stay of the local public transport while the private car is the main individual mode of transport. The bus is of most value where traffic flows are moderately concentrated and where there are sufficient road areas. Mention is made of adequate waiting and parking facilities to ensure comfortable changes between different modes, and of the operational requirements of the system. This article was originally published in German in "Hamburger Hochbahn AG". (TRRL) [German]

Transport and Road Research Laboratory Translation 3087, 1983, 10p, 4 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 271556)  
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42 380899

#### TRANSPORT DEMAND IN URBAN AND SUBURBAN TRANSIT IN ZAGREB [PROMETNA POTRAZNJA U GRADSKOM I PRIGRADSKOM PROMETU GRADA ZAGREBA]

Two segments of transport demand, work trips and school trips, are of a particular interest in transport planning and organization of urban transit, because these trips take place in the morning and early afternoon peak periods. This is also why matrices for "work" and "school" trip purposes by transport zones and transit modes are of a particular interest. Matrices with the number of persons which commute daily to work and school have been developed for the various sectors of the city of Zagreb. The number of persons commuting to work and school in Zagreb (from specific locations in Croatia) has also been listed. (TRRL) [Croatian]

Racic, A *Suvremeni Promet* Vol. 4 No. 5-6, Sept. 1982, pp 437-440, 6 Tab., 2 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 270878)  
ORDER FROM: Institut Prometnih Znanosti, Gruska 20, Zagreb, Croatia, Yugoslavia

42 381013

#### ALBUQUERQUE SUN-TRAN TRANSIT DEVELOPMENT PROGRAM. JULY 1, 1983 TO JUNE 30, 1988

Sun-Tran, the bus system in Albuquerque, N.M., was studied to produce a 5-year Transit Development Program. This TDP is comprised of 2 volumes. Volume I contains a review of existing city transit policies as well as a historical and statistical description of Sun-Tran's operating configuration, financial and ridership characteristics. Major service options needed to be considered for future planning are also presented. Volume II makes recommendations for future transit operations in Albuquerque. A recommended policy and service plan are given. Finally a financial plan for facilities, equipment and operations is developed. Confronted with declining Federal subsidy, the goal is to cover 35% of total operating costs at the farebox by 1988. Special emphasis should be placed on facilitating use of the bus service by youth, elderly and handicapped.

See also Volume I, SPR-181 and Volume II, SPR-184.

Middle Rio-Grande Council of Govts of New Mexico SPR-186, June 1983, v.p., Figs., Tabs., 4 App.

ORDER FROM: Middle Rio-Grande Council of Govts of New Mexico, 924 Park Avenue, SW, Albuquerque, New Mexico, 87102

#### 42 381015

##### FINAL REPORT FOR SAN JUAN TRANSPORTATION PLANNING MODELS

The development, calibration and validation of travel demand models for the San Juan metropolitan area are described in this report which does not deal with data processing considerations. The user manual, also developed as part of this study, is a companion volume, explaining the application of travel demand models. The models are developed with the Urban Transportation Planning System (UTPS) programs. The models also contain a program from FHWA's PLANPAC battery, and a few IBM utility programs. Several special-purpose Fortran programs were used to prepare, manipulate and analyze data during calibration. Analysis using the Statistical Package for the Social Sciences (SPSS) were run. Trip generation modeling was aimed at developing a cross-classification procedure for estimating trip-production and procedures for estimating trip attractions that were not tied to a specific zone structure. These procedures are intended to give accurate estimates of trip-making in San Juan.

Schimpler-Corradino, Associates, Commonwealth of Puerto Rico UMTA-PR-09-0007, Aug. 1983, v.p., 14 Fig., 42 Tab., 3 App.

ORDER FROM: Schimpler-Corradino, Associates, 1429 South Third Street, Louisville, Kentucky, 40208

#### 42 381428

##### ADMINISTRATION OF TRANSPORT SYSTEMS MANAGEMENT IN AUSTRALIA

The efficiency and effectiveness of an urban transport system is vitally affected by the administrative framework within which transport planning and operation takes place. A framework which permits the establishment of recognised policy, allows for effective modal interplay, properly relates planning to implementation, and ensures effective liaison between various transport supply agencies will inevitably produce a better transport system than a framework which does not have these characteristics. The influence of the administrative framework on urban transport planning is perhaps stronger in Australia than elsewhere. The federal system of government means that at least three levels of government are involved, each with legitimate, but not necessarily compatible interests. Moreover, since in each state the capital city has a very large proportion of the total state population, state governments have a much larger interest and influence than elsewhere; many of the planning and operational functions of state governments in Australia would be the responsibility of local or metropolitan governments elsewhere (eg, in USA and UK). TSM helps to facilitate the more efficient use of existing transport facilities to achieve various objectives, including improving the mobility of people and goods (not vehicles) through the following actions: 1) comprehensive traffic management of the street system, 2) improvements in public transport operations, 3) management of the overall transport system to ensure that the objectives of the various modes are coordinated. TSM also requires the establishment of goals and objectives at a local level within the framework of state and national goals and objectives. The thesis documents the organizational structures and administrative procedures currently in existence in Australia and has explored such changes in them as may be necessary to foster the tsm concepts in this country. The thesis was submitted as partial fulfilment of the requirement for the award of Master of Engineering Science Degree, Monash University.

Sani, SP

Monash University, Australia Thesis July 1980, n.p.

ACKNOWLEDGMENT: TRRL (IRRD 266513), Australian Road Research Board

ORDER FROM: Monash University, Australia, Wellington Road, Clayton, Victoria 3168, Australia

#### 42 381448

##### TRANSPORT TRENDS IN CAMDEN

This note is the fifth in a series of reports examining transport trends in Camden. The purpose of the report is to bring together data collected on a regular basis regarding transport in the borough. Such a data base provides

a useful source of information for monitoring trends in the borough, and establishing the implications for policy. The transport trends in the borough are considered under five main headings: road traffic, buses, the underground, British Rail, bicycles and motor cycles, accidents, and car ownership. Data is set out in the form of tables and figures, and accompanied by text drawing out the main conclusions from an investigation of the data. Reference is made, where applicable, to the implications of trends for the council's transport policies as outlined in the district plan.

Boyle, R

London Borough of Camden PC 8304, Sept. 1983, 21p, 9 Fig., 18 Tab., 9 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272623)

ORDER FROM: London Borough of Camden, Dept of Planning & Comm, Camden Town Hall, Argyle Street, London, England

#### 42 381449

##### A MAP PROFILE OF GREATER LONDON IN 1981

One section of this publication contains maps on travel within greater London giving data on: households owning one or more cars, percent of employed residents travelling to work by car, percent of employed residents travelling to work by br train, percent of employed residents travelling to work by underground, percent of employed residents travelling to work by bus.

Congdon, P GLC Statistical Series No. 23, 1983, 71p, 66 Fig., 3 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 272636)

ORDER FROM: Greater London Council, County Hall, London SE1 7PB, England

#### 42 381450

##### CONTRAST AND CONVERGENCE: URBAN TRANSPORT PLANNING IN DEVELOPING AND INDUSTRIALIZED CONTEXTS

Urban transport planning for developing countries lacks an effective paradigm. The staggering waste in human energy, time, and fuel in large and growing ldc cities is not likely to be reduced by the ineffective formulae and inappropriate technologies typically transferred from industrialised country practice. Substantial improvement appears to require a new approach, one which recognises that deceptively familiar transport problems of cities in ldc's- "go slows" extended commutation, modal mismatch and malfunction-arise from the larger context of underdevelopment with its characteristic manifestations in cities. This fact limits the relevance of developed country processes and solutions. The impact of overall resource scarcity, economic and natural, is obvious. Other factors, less well recognised, are equally determining. These include a rapidly growing youthful population, a dualistic income distribution, the anti-poor bias of public agencies, fuel and vehicle costs determined by development policy, an urban institutional vacuum in the context of a competition for scarce developmental resources, climatic extremes, a village lifestyle transplanted to a sprawling but high density context, a high degree of theoretical government control over land-use and infrastructure undisciplined by forward planning or enforcement powers, a shortage of technical manpower. The transport planning profession in both the Industrial and developing world is a long way from forging a consensus on the nature of the ldc urban transport problem- much less a coherent strategy with ameliorative potential. Recognising that the transport problems of ldc cities cannot be separated from their context represents the starting point for a new paradigm with greater promise of long-run improvement. The paper characterises the problems and context of typical large ldc cities, evaluates the relevance of conventional transport planning methods and solutions, and suggests more promising new directions. For the covering abstract of the seminar see IRRD no 272657.

Transport Planning in Developing Countries. Proceedings of Seminar H held at the PTRC 10th Summer Annual Meeting.

Lockwood, SC Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 91-106, 1 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 272665)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England



42 381545

**SIMPLIFIED AIDS FOR TRANSPORTATION ANALYSIS: PRINCIPLES AND PROCEDURES FOR SUBAREA PLANNING**

The Guide provides the planner with guidance in designing the planning analysis and selecting the techniques for carrying out specific types of subarea planning studies. The guide addresses the many variations of subarea planning problems including: (1) short and long range studies; (2) use of TSM operational and low cost as well as major capital improvement actions; and (3) planning at the corridor level, for activity centers such as CBD's and for localized sites and facilities. The study approach includes seven steps discussed in this report: Define the Problem; Define the Study Area; Organize the Technical Approach; Base or Existing Conditions Analysis; Future Conditions Analysis; Generating, Testing and Evaluating Alternatives; and Recommendations and Preparation of Implementation Program. Three case studies accompany this guide which illustrate applications of the Principles and Procedures to a short range TSM corridor planning study, a short range TSM subarea (CBD) planning study, and a major capital improvement planning study.

See also PB84-104579.

Golenberg, M Howard, JA  
SG Associates, Incorporated, Multisystems, Incorporated, Federal Highway Administration, Urban Mass Transportation Administration Final Rpt. FHWA/PL-83/003, May 1983, 89p Contract DTFH61-80-0071

ORDER FROM: NTIS PB84-104561

42 381546

**SIMPLIFIED AIDS FOR TRANSPORTATION ANALYSIS: A MAJOR CAPITOL IMPROVEMENT SUBAREA PLANNING CASE STUDY**

This case study is one in a series of three case studies which illustrate approaches to specific types of subarea planning studies. This study of medium and long range highway planning in Hudson, Massachusetts illustrates plan development for localized transportation needs carried out within the context of on-going regional system planning. The approach used in this study was developed by applying the general principles outlined in the Principles and Procedures Guide to a specific problem in a specific setting. The approach includes six basic steps, described in this report.

See also PB84-104587.

Golenberg, M Howard, JA  
SG Associates, Incorporated, Multisystems, Incorporated, Federal Highway Administration, Urban Mass Transportation Administration FHWA/PL-83/004, May 1983, 96p Contract DTFH61-80-0071

ORDER FROM: NTIS PB84-104579

42 381547

**SIMPLIFIED AIDS FOR TRANSPORTATION ANALYSIS: A SHORT RANGE TSM SUBAREA PLANNING CASE STUDY**

This case study is one in a series of three case studies which illustrate approaches for specific types of subarea planning studies. This study, for the downtown area of Lewiston, Maine, is an example of short range TSM highway circulation system and highway deficiency improvement planning for an activity center. The approach used for this study was developed by applying the general principles contained in the principles and procedures Guide to a specific problem in a specific setting. The approach is developed in six steps, which are described in this report.

See also PB84-104595.

Golenberg, M Howard, JA  
SG Associates, Incorporated, Multisystems, Incorporated, Federal Highway Administration, Urban Mass Transportation Administration FHWA/PL-83/005, May 1983, 83p Contract DTFH61-80-0071

ORDER FROM: NTIS PB84-104587

42 381548

**SIMPLIFIED AIDS FOR TRANSPORTATION ANALYSIS: A SHORT RANGE TSM CORRIDOR PLANNING CASE STUDY**

This case study is one of a series of three case studies which illustrate approaches to specific types of subarea planning studies. This study for the Lisbon Street arterial corridor in Lewiston, Maine is an example of short range TSM corridor improvement planning in a low to moderate growth area. The approach used for this study was developed by applying the general principles contained in the principles and procedures Guide to a

specific problem in a specific setting. This approach includes six basic steps, as presented in the chapters of this case study.

See also PB84-104561.

Golenberg, M Howard, JA  
SG Associates, Incorporated, Multisystems, Incorporated, Federal Highway Administration, Urban Mass Transportation Administration Final Rpt. FHWA/PL-83/006, May 1983, 86p Contract DTFH61-80-0071

ORDER FROM: NTIS PB84-104595

42 381564

**TRANSPORT PLANNING AND POLICY IN HIROSHIMA AREA**

Hiroshima has been gradually involved into the political struggle by different transport interest groups. Unfortunately, the present position is that the self interest of various factions are delaying the final acceptance of a transport plan for Hiroshima. The following topics are discussed: Urbanization and Hiroshima region; public transport systems and passengers; change of journey patterns; and development of public transport planning and policy.

Sugie, Y  
Oxford University, England TSU/REF-220/CP, June 1983, 15p

ORDER FROM: NTIS PB84-114388

42 381568

**RESEARCH INTO CONSUMER NEEDS**

The results of two different approaches to consumer needs are summarized. There are (1) economic studies of travel demand, and (2) ranking systems designed to produce an index of need. These summaries are followed by discussion of a proposed system for national and local public transport planning, based on the maximizing of passenger miles subject to a financial constraint, where different categories of passenger miles are given weights according to politically determined value judgements.

Goodwin, PB  
Oxford University, England TSU/REF-182/CP, Apr. 1982, 11p

ORDER FROM: NTIS PB84-111582

42 381573

**DEFINING A ROLE FOR DISAGGREGATE TRAVEL-DEMAND MODELS**

There have been considerable advances in the development of the generation two, disaggregate travel-demand models, but no serious efforts to prescribe the kinds of application for which they are particularly suited (or inappropriate). A disaggregate activity rescheduling model is briefly described which handles response at the pattern level, and the paper concludes with an assessment of the role of the conventional disaggregate model.

Jones, PM  
Oxford University, England TSU/REF-127/CP, 1980, 24p

ORDER FROM: PB84-114115

42 381595

**THE EVALUATION OF RAIL INVESTMENT IN A COMPARABLE WAY TO ROAD-A CONSIDERATION OF THE IMPACT OF A POTENTIAL RAIL SCHEME ON ROAD TRAFFIC**

This paper, which is presented in the form of an abstract, considers a potential rail investment scheme in the London- West Midlands, North West and Glasgow corridor. The scheme consists of a combination of track improvements on both fast and slow lines and faster rolling stock. Both inter-city and commuting services would be improved. As well as examining the factors traditionally considered in a rail investment scheme-initial outlay, reduction in operating costs, increase in revenue and hence the financial return to the railway-the paper will pay particular attention to the problems of estimating the effect on road traffic in the corridor (particularly the M1). In addition, the various elements that would need to be included to make an assessment comparable with that of a road scheme will be considered and those where further research is required will be highlighted. The implications of comparability for national transport and economic policies will also be briefly discussed. (TRRL)

Transport Policy. Proceedings of Seminar M held at the PTRC 11th Summer Annual Meeting, University of Sussex.

Segal, JF (British Rail) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1983, p 21*

ACKNOWLEDGMENT: TRRL (IRRD 273082)  
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42 381610

#### THE ATTRIBUTES AND NEEDS OF THE NON-TRAVELLER

Since the primary objective of transportation research has been to focus on the needs of a travelling world, it is not surprising that the characteristics of the non-traveller have received little attention. When non-travellers have been considered, it has usually been in the context of the transport disadvantages where it has been assumed that non-travel reflects lack of travel opportunities—and therefore can be equated in some way with latent travel demand. Close analysis of the characteristics of those persons who did not travel on a sample travel day gives interesting insights into the factors influencing their behaviour. Results are presented which show that non-travellers fall into two categories. Some—the “transport disadvantaged”—cited inequities in the availability of transport and reported non-travel due to difficulties in accessing or using existing facilities. At the same time, a much larger number of persons claimed that they had no need to travel. If it is argued that the main purpose of travel is to reach activities which take place in different locations, it seems reasonable to assume that there must be occasions when sufficient activities are available at one location to reduce the need to travel. Results support this contention and it is shown that the incidence of visits and deliveries to the home is extremely high among this sample of non-travellers. The socio-demographic characteristics of non-travelling individuals and of the household members with whom they live give added information about the attributes and needs of these persons. Two planning implications are discussed; the degree to which the non-traveller is the reason/purpose for another person's travel, and the need to separate the requirements of the apparent and real transport disadvantaged non-traveller. (Author/TRRL)

Proceedings of Seminar P held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Ampt, ES (State Transportation Study Group of Sydney) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 59-67, 1 Fig., 7 Tab., 6 Ref.*

ACKNOWLEDGMENT: TRRL (IRRD 272886)  
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42 381629

#### ATTITUDES AND MODE CHOICE

In recent years attitudinal modelling approaches have attracted considerable interest in transport planning. However, there are several problems associated with the traditional attitudinal choice model which have often been overlooked. In the paper we deal with some of these problems, and especially the causality issue in the attitude-behaviour relationship. Most attitudinal choice models specify behaviour as a function of people's attitudes, but recent psychological theory suggests alternative causal relationships. The concept of causality in the attitude-behaviour relationship is first dealt with at a theoretical level, and then the results of a practical research project are presented. It is concluded that there is evidence both at the theoretical level and from empirical research that in practice complex inter-actions are taking place between attitudes and mode choice behaviour. This conclusion, together with problems related to the measurement and the prediction of attitudes, reduce the potential volume of the unidirectional attitudinal choice model to the transport planner. Hence it is suggested, that instead of aiming at the development of general attitudinal choice models research should focus on the more specific attitudinal approaches such as h.a.t.s. and the situational approach. (Author/TRRL)

Transportation Analysis and Models. Proceedings of Seminar Q held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Kroes, EP (Netherlands Institute of Transport); Meijer, HER (Netherlands Railways) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 159-167, 2 Fig., 22 Ref.*

ACKNOWLEDGMENT: TRRL (IRRD 272779)  
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42 381639

#### RECALIBRATION OF DISAGGREGATE MODE CHOICE MODELS BASED ON ON-BOARD SURVEY DATA

A growing number of transportation planners and modellers use disaggregate logit mode choice models as an element in the demand estimation process. The paper describes a method for recalibration of logit models using widely available on-board survey data. Logit mode choice models are applied on a variety of populations, such as actually surveyed households, “simulated travellers” who are generated by Monte Carlo techniques, “aggregate” travellers who represent whole traffic zones, etc. The estimated choices are aggregated to provide estimates of ridership by mode. In many cases, the data for direct model calibration are not available, and modellers have to rely on published models which do not always fit their particular circumstances. Even in cases where data are available and calibration is performed, sampling and modelling imperfections might result in large errors when aggregate estimates are compared to observed data. On-board surveys are inexpensive, simple to conduct, and are widely available. A properly conducted survey can provide reliable estimates of transit ridership. This paper describes a procedure for adjusting logit model parameters so that the aggregate ridership estimates best approximate ridership estimates from an on-board survey. The procedure addresses the various issues of calibrating a disaggregate model with aggregate data. It takes particular care to account for the highly non-linear nature of the logit model. Through appropriate transformation, the problem is linearized; correlation tables and linear regressions are used in a semi-manual iterative process to adjust the model's parameters. The objective of the process is to maximize the amount of variations which is explained by the model, while approximating the observed transit ridership by submode and district. The paper describes the application of the model in Cleveland, Ohio. (Author/TRRL)

Transportation Analysis and Models. Proceedings of Seminar Q held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Gur, YJ (Technion-Israel Institute of Technology) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 289-300, 1 Fig., 1 Tab., 9 Ref.*

ACKNOWLEDGMENT: TRRL (IRRD 272789)  
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42 381640

#### SURVEY DESIGN FOR TRIP DISTRIBUTION STUDIES

This work follows on from the RATM trip distribution investigation conducted by the Institute for Transport Studies and from more recent research into error estimation for the Department of Transport. Both roadside and household interviewing are expensive ways of collecting the information necessary to calibrate a trip distribution model. It is well known that stratification leads to more efficient designs and that it is possible to apportion survey effort to maximise precision for a given budget. Incorporating this idea into the design of a trip distribution survey raises interesting issues. Most sample surveys use their data for direct estimates of quantities of interest, such as a population means or proportions, and these quantities are unrelated. On the other hand trip distribution studies collect data to calibrate a gravity model or a version of it. The existence of an underlying model enables increased efficiency and allowance for the possibility of a mis-specified or ill fitting gravity model leads to designs which compromise between bias and efficiency. This is particularly apparent when the final estimate of a trip matrix can be expressed as combinations of original data and modelled flows. Practical applications of those designs require some preliminary estimates of the parameters. Numerical illustrations of the techniques are given. (Author/TRRL)

Transportation Analysis and Models. Proceedings of Seminar Q held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Whittaker, J (Lancaster and Leeds University, England) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 301-309, 6 Ref.*

ACKNOWLEDGMENT: TRRL (IRRD 272790)

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**42 381645  
NESTED LOGIT TRAVEL DEMAND MODELS FOR MORE THAN TWO ALTERNATIVES IN URBAN CORRIDORS**

The nested logit model (nl) is a generalisation of the simple or multinomial logit (mnl) model that copes with the "independence from irrelevant alternatives" problem of the latter. Being a generalisation, however, means that it is more difficult and expensive to calibrate and use. This paper uses data for the Garforth-Leeds corridor in west Yorkshire (1975 based) and for the Las Condes-CBD corridor in Santiago, Chile (1981 based) to calibrate mnl and nested logit models for these two different environments, in order to analyse and evaluate the justification of the use of more general specifications as the nl. The problem of structural specification of nl models in practice is also addressed. For the British case a comparison is also made of aggregate and disaggregate n. specifications. (Author/TRRL)

Transportation Analysis and Models. Proceedings of Seminar Q held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Delliams, HC (Pontifical Catholic University, Chile); Fernandez, JE *Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 353-366, 2 Fig., 6 Tab., Refs.*

ACKNOWLEDGMENT: TRRL (IRRD 272795)  
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**42 381646  
A GENERAL MULTINOMIAL LOGIT CHOICE MODEL INCORPORATING ALTERNATIVES IN URBAN CORRIDORS**

The nested logit model (nl) is a generalisation of the but particularly in modal split, trip distribution, and "independence from irrelevant alternatives" problem of the use is the multinomial logit model, but when more than two more difficult and expensive to calibrate and use. This misleading results due to its inability to take account of Yorkshire (1975 based) and for the Las Condes-CBD corridor models have led to hierarchical logit models, and the logit models for these two different environments, in order the calculation of choice probability in the mnp model are general specifications as the nl. The problem of structural made to numerical integration, simulation, or an For the British case a comparison is also made of aggregate method generally used for this approximation is occasionally approximation method is described which does not suffer those large errors. (Author/TRRL)

Transportation Analysis and Models. Proceedings of Seminar Q held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Langdon, MG (Pontifical Catholic University, Chile); Fernandez, JE *Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 353-366, 2 Fig., 6 Tab., Refs.*

ACKNOWLEDGMENT: TRRL (IRRD 272795)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**42 381668  
TRANSPORTATION SYSTEM MANAGEMENT (TSM) IN THE USA**

Transportation system management (TSM) is not new. The overall concept is to get the greatest possible utilization out of the existing system. Engineers and transportation planners have been practicing it (TSM) for years. But, the TSM concept, as an organised, inter-modal region-wide process, is relatively new (5-10 years). This paper discusses the character projects, organisational structure (including federal, state and local perspectives) of the TSM process and the impact of financial, political and environmental concerns. The application and character of a number of TSM tactics is touched upon. Particular attention is paid to the programming, prioritizing and evaluation of TSM projects and processes in light of the diverse character of urban centres in the United States. (Author/TRRL)

Pedestrians and Traffic. Proceedings of Seminar L held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Crowell, BN (Crain and Associates, Incorporated) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 249-260, 5 Fig., 8 Ref.*

ACKNOWLEDGMENT: TRRL (IRRD 272819)  
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**42 381672  
SOUTHERN CALIFORNIA URBAN TRANSPORTATION: FINANCIAL NECESSITY MAY BE THE MOTHER OF INVENTION**

Southern California has long been a captive of the automobile and excellent freeway system, but public urban transportation has served a vital role for commutation and mobility disadvantaged groups. That role is becoming more difficult. The region holds over ten million citizens and is projected to grow to thirteen million by the year 2000. However, current urban transportation is near capacity. Freeway systems are saturated at commuting hours. Such growth in travel would be almost impossible to absorb, and current national federal transportation and general governmental policies promise to make urban transportation much more expensive to the provider and user. The paper documents and analyzes attempts by Southern California urban transportation public agencies to confront and deal with the dilemma of shrinking resources and increasing travel demand. Major initiatives are underway to: increase non-federal financial sources, productivity, employer-based ridesharing; build new light-rail systems; tap private development tax generation; permit private road development and maintenance; and consider toll roads and freeways. For Southern California, each of these activities is quite new. When considered together, they represent a radical change in public transportation official attitude about the role of the private sector and the need for a true public-private partnership to provide an adequate urban transportation system. Under true financial emergency conditions stimulated by a sluggish economy and national government philosophic changes, innovative and lasting public-private cooperation is being forged for the second largest metropolitan area in the United States. (Author/TRRL)

Public Transport. Proceedings of Seminar M held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Shaw, PL (California State University, Long Beach) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 1-13, Refs.*

ACKNOWLEDGMENT: TRRL (IRRD 272834)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**42 381682  
PARTICIPATION IN PUBLIC TRANSPORT PLANS**

At the PTRC summer annual meeting in 1979 the author presented a paper "Public passenger transport plans—their effectiveness as a planning discipline". This was based upon a national survey of county councils and a study of many of the first PTPS to be published. The author reported "...it would appear that the objectives of the Transport Act 1978 have been met. But the cost has been high and it is questionable whether the incremental benefits in future years will in any way justify the annual cost." Three years later, in response to resolutions of the 1980 National Consumer Congress, the Welsh and National Consumer Councils commissioned the author to undertake a comprehensive study of the public transport planning process in the non-metropolitan counties of England and Wales. The purposes of the exercise are threefold:-(a) to increase the public's awareness of their rights to participate in the public transport plan-making process by the distribution of 5000 leaflets, mainly in Wales. To encourage and assist them to question the policies in their local PTPS by publication of a 36 page booklet "Public transport plans and all that". (b) to investigate the existing system of public transport planning and to identify and explain alternative systems. (c) to provide the consumer councils with the basis on which to approach central government to discuss changes to legislation and/or the priority attached to public transport and to recommend any further action considered necessary to encourage county councils to comply with the spirit of the Transport Act 1978. The study has comprised surveys of consultees and county councils together with interviews with selected experts. (Author/TRRL)

Public Transport. Proceedings of Seminar M held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Winfield, RC (University of Wales Institute of Science & Tech)  
**Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp**  
 155-164, 3 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272846)

ORDER FROM: Planning and Transport Res and Computation Co  
 Ltd, 110 Strand, London WC2, England

42 381693

**INVESTING IN TRANSPORTATION MODELS :  
 CONSIDERATIONS OF A SWISS REGIONAL PLANNING  
 AGENCY**

The paper is concerned with the following question: how much time and money to invest in which type of transportation models? The problem is treated in the context of a state planning agency, responsible for the preparation of all types of regional plans, including transportation plans, for a region of about 70,000 inhabitants. The planning process in a democratic environment serves as a framework:-the procedures to execute existing laws and ordinances and to revise them or to submit new proposals;-the position of a state planning agency with regard to other government agencies and communities in project preparation; the criteria of politicians as decision makers;-the questions asked by voters as decision makers;-the behavioural characteristics of the population within the transportation and land-use system. Within this framework the planning agency has to allocate time and money to do its job: to prepare plans that it thinks are sound, that will find the approval of the decision makers and can serve as a basis for projects and their execution. Through this planning process the contribution of transportation models is traced. (Author/TRRL)

Transportation Planning Practice. Proceedings of Seminar N held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Buechi, MJ (Zurich Consultants Limited, Zurich) **Planning &  
 Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp 103-109**

ACKNOWLEDGMENT: TRRL (IRRD 272869)

ORDER FROM: Planning and Transport Res and Computation Co  
 Ltd, 110 Strand, London WC2, England

42 381695

**PUBLIC TRANSPORT PLANNING-THE END OF AN ERA?**

This paper is based on a study, the purpose of which was to investigate the effectiveness of the public transport planning system operating in the non-metropolitan counties of England and Wales with special reference to the public transport plan. The study comprised a survey of county council officers and detailed analysis of public transport plans in six counties; bus operators in these counties were also surveyed. In-depth interviews with public transport co-ordination officers from 5 county councils and five other experts concerned with public transport research or policy development also took place. A major consideration during the study was public participation in public transport plans. The main findings of the study were: (1) public transport planning is not an end in itself, but a means to accessibility; (2) public transport planning should be decentralised; (3) public transport planning has not achieved any improvement in co-operation between planners, operators and consumers; (4) local authorities and operators have not, in general, complied with the requirement to enter into agreements for the provision and financing of services required for social purposes. This paper recommends the production of local accessibility plans instead of public transport plans, a change of emphasis from county council subsidies towards district council subsidies, and the formation of regional public transport authorities to administer the public service obligation grant. (TRRL) covering abstract of the seminar see IRRD 272861.

Transportation Planning Practice. Proceedings of Seminar N held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Winfield, RC (University of Wales Institute of Science & Tech)  
**Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982, pp**  
 127-137, 4 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272871)

ORDER FROM: Planning and Transport Res and Computation Co  
 Ltd, 110 Strand, London WC2, England

42 382221

**METROPOLITAN TRANSPORTATION PLANNING**

This textbook is developed around the concept of the transportation planning process, identified as having 10 stages from problem identification through implementation, operation and maintenance of a plan, policy or solution to alleviate the identified problem. Each chapter corresponds with the steps in that process. The authors stress that there is greater emphasis on breadth, rather than depth, in treating the various topics. Much attention is given to public transportation characteristics (speed, capacity, etc.); user costs; air and noise pollution impacts; post-project evaluation; actual decision making and community involvement; transportation system management; and plans at the strategy, policy and project levels. Greatest emphasis has been given to finance, budgeting and related legislation and organization.

Dickey, JW Diewald, WJ (Lea (ND) and Associates, Incorporated);  
 Hobeika, AG Hurst, CJ Stephens, NT Stuart, RC Walker, RD  
 (Virginia Polytechnic Institute & State University)  
 Hemisphere Publishing Corporation, McGraw-Hill Book Company,  
 Incorporated 2nd ed No Date, 607p, Figs., Tabs., 2 App.

ORDER FROM: Hemisphere Publishing Corporation, 1025 Vermont  
 Avenue, NW, Washington, D.C., 20005

42 382225

**TRANSIT MANAGEMENT IMPROVEMENT PLAN**

This study of El Paso's Sun City Area Transit (SCAT) focused on five functional areas of this Texas transit system: Transportation operations, maintenance, financial management and accounting, personnel, and marketing. Since the City took over complete control in 1978, significant capital improvements have been made. In FY1982 SCAT handled over 9 million passengers, higher than many U.S. cities of comparable size. Despite its success and demonstrated public need, public transit is under increasing financial pressure. The study deals primarily with improving transit operations as a means of delivering the best possible service at the least possible cost. Extensive data was collected and on-site investigations were made of SCAT operations. The study team then analyzed the data and established priorities for those functional areas needing further attention. These needs are described.

McDonald Transit Associates, Incorporated, El Paso, City of, Texas  
 UMTA-TX-09-0097, Oct. 1983, v.p.

ORDER FROM: McDonald Transit Associates, Incorporated, 5009  
 Brentwood Stair Road, Suite 305, Fort Worth, Texas, 76112

42 382226

**UTPS—TECHNICAL SUPPORT AND UPDATING**

The Urban Transportation Planning System (UTPS) is a package of computer programs that evaluate the impacts of changes in transportation services. For the package to be useful, much time and money must be dedicated to the coding of the existing transit system into a format readable by the programs. The use of UTPS by the New York City Department of City Planning over the past decade is discussed. This report documents the work that took place and discusses some of the possibilities it presents for the future. A detailed analysis of the UTPS data base that existed when the study began was made. The data base was updated and completed where necessary then integrated into a citywide model. The models were checked and used in a study of free transfers in the subway network. Results were mixed. The transfer study was an excellent method for checking accuracy of the model coding; its was found that details of the models were not precise enough to look at neighborhoods where many transit options exist. With the potential for a citywide UTPS model existing, changes in land use or transit service can be analyzed. More flexible transit zone systems will be needed, along with trip tables and a wider range to time periods.

New York City Department of City Planning Final Rpt. UMTA-NY-  
 09-0064, May 1983, 70p, 4 App.

ORDER FROM: New York City Department of City Planning,  
 Transportation Division, New York, New York

42 382242

**TOWN OF HUNTINGTON MASS TRANSIT DEVELOPMENT  
 PLAN UPDATE—FINAL REPORT**

Huntington, N.Y., has operated its Huntington Area Rapid Transit  
 (HART) bus system since 1978 during which time the ridership has tripled

as service has been modified and marketed. This study assesses HART services, operations and management. It then presents a planned approach for improvement and expansion of HART services to increase operating efficiency and more effectively serve the public transit needs of the Town's population. The plan calls for incremental development of 6 daily routes and two Saturday routes, four commuter routes and continued senior bus services. There are recommendations for 8 lift-equipped buses, a maintenance facility, a transfer center and bus shelters. A special plan calls for fixed-route accessible bus service and use of wheelchair-lift vans when there is no fixed-route service.

Prepared in conjunction with Dalton Baugh and Associates.

Smith (Wilbur) and Associated, Incorporated TSE-541, May 1983, 190p, Figs., Tabs., 1 App. Grant UMTA-NY-09-0064  
 ORDER FROM: Smith (Wilbur) and Associates, Incorporated, 135 College Street, P.O. Box 1809, New Haven, Connecticut, 06507

**42 382307**

**HOME-ORIGIN TRANSIT TRAVEL ANALYSIS MODEL**

The major findings of a bus patronage forecasting project to develop a simple short-range planning model for bus transit demand analysis in Albuquerque, New Mexico, are presented. The model would be typically applied by an analyst lacking specialized mathematical expertise by using commonly available data to analyze the ridership impacts of proposed transit service changes. Analysis of the information needs of Albuquerque officials and of the ridership patterns of Albuquerque Sun Tran users revealed that a focus on residential service requirements should have the highest analytic priority. In response to this need, a linear home-origin transit generation model was developed that could be manually applied to predict ridership response to service changes. The model is sensitive to a wide range of service, policy, socioeconomic, and land use factors. Validation studies on the model indicate that the model prediction are quite accurate. The technique should be transferable to other urban areas, especially rapidly growing multicentered sunbelt cities lacking the radial structure and dominant core of older American cities.

This paper appeared in Transportation Research Record No. 915, Urban Buses: Planning and Operations.

Nelson, DO O'Neil, KK (Boston and Maine Corporation)  
 Transportation Research Record No. 915, 1983, pp 24-30, 3 Fig., 3 Ref.

ORDER FROM: TRB Publications Off DOTL JC

**42 382593**

**THIS TRAIN IS WITHOUT A DESTINATION: A COST BENEFIT ANALYSIS OF THE RETENTION OF RAILWAY SERVICES—THE PENISTONE LINE**

The paper undertakes a cost-benefit analysis of a disinvestment using readily available data and demonstrates that a relatively straightforward yet systematic approach can provide useful input to the decision-making process. Despite various assumptions necessitated by the analysis, it is argued that the net benefits of the railway line retention are unlikely to be significantly sensitive to their variation within feasible limits. The most significant component in the analysis is seen to be the operative costing system and it is argued that this should be revised.

Hooper, J Kenworthy, P Pitfield, DE (Loughborough University of Technology, England) Transportation Planning and Technology Vol. 8 No. 4, 1984, pp 237-252, 1 Fig., 6 Tab., 7 Ref.

ORDER FROM: ESL

**42 382613**

**TRANSPORTATION PLANNING: TOWARD A DECISION-ORIENTED APPROACH**

Urban transportation planning is undergoing significant changes that reflect the characteristics of the field. Growing fiscal pressures along with increased attention to maintenance and rehabilitation of transportation infrastructure have created new demands on transportation planners. The underlying premise of this report is that the planning methodology and analysis tools used within the planning process should be consistent with the substance and form of a transportation decisionmaking process. There are, however, many different ways of viewing the decisionmaking process. Understanding that the nature of alternative decisionmaking processes, and the needs and capabilities of those who are responsible for it, is thus a

prerequisite for the development of an effective transportation planning process. This report identified the salient characteristics of the evolution of the transportation planning process and related them to the types of decisions facing local and state officials. The characteristics of different decisionmaking models are examined and their relationship to planning is illustrated. The report describes the key elements of decisionmaking as pluralistic, resource-allocative, consensus-seeking, problem-simplifying, and uncertainty-avoiding. These elements are then related to the characteristics of a decision-oriented planning process. A planning framework is then described which will best fit the new characteristics of transportation policy. The report concludes that for transportation planners to provide more useful input into decisionmaking, they must carefully assess their own process and determine where the process differs from the chart in the report (Figure 3), which depicts the transportation planning process. These differences should then become the focal point for a detailed examination of how, or if, the existing process should be modified.

Meyer, MD

Massachusetts Institute of Technology, Urban Mass Transportation Administration Final Rpt. UMTA-MA-06-0145-83-1, Sept. 1983, 62p Contract MA-06-0145  
 ORDER FROM: NTIS PB84-141340

**42 382625**

**INNOVATION IN PUBLIC TRANSPORTATION. UMTA TECHNICAL ASSISTANCE PROGRAM DIRECTORY. FISCAL YEAR 1982**

This eleventh Annual Directory contains descriptions of Research, Development, Demonstration (RD&D) and training projects sponsored and funded by the Urban Mass Transportation Administration (UMTA) of the Department of Transportation. This Directory focuses on activities that took place in Fiscal Year 1982. Together, these projects constitute the Federal program of technical assistance for urban transportation. The projects described in this Directory are funded under Sections 6, 8, 10, and 11 of the Urban Mass Transportation Act of 1964, as amended. Section 6 programs of the Act pertain to research, development and demonstration projects in all phases of urban mass transportation, including transportation planning and management, testing, demonstration of new facilities, equipment, techniques, and methods. Section 8 programs of the ACT are aimed at conducting local transportation planning studies, known as Technical Studies. A portion of these Technical Studies funds are also used annually for Special Studies to help local planning agencies and UMTA improve the quality of information used for local transportation planning. Section 10 programs of the ACT pertain to managerial training grants that are made available to States and local public agencies to provide fellowships for training of personnel employed in managerial, technical, and professional positions in the urban mass transportation field. Section 11 programs of the ACT pertain to university research and training. This program is designed to contribute to UMTA's research and to stimulate professional growth in fields relating to transportation. Appendix A of this Directory contains Sources of Technical Assistance Information and Appendix B contains information pertaining to Urban Mass Transportation Grants and Contracts: Application and Procurement Procedures.

Transportation Systems Center, Urban Mass Transportation Administration UMTA-MA-06-0086-83-1, DOT-TSC-UMTA-83-39, Aug. 1983, 178p Contract MA-06-0086  
 ORDER FROM: NTIS PB84-128453

**42 382717**

**THE MAGNITUDE OF INDIVIDUAL-LEVEL VARIATIONS IN DEMAND COEFFICIENTS: A XENIA, OHIO CASE EXAMPLE**

The research reported in this paper develops individual value and choice expressions for a sample of travelers in Xenia, Ohio, USA. A brief description of the methodology for constructing and forecasting with individual-level demand equations is given, relying principally on multiple linear regression and multiple analysis of variance. The research tests the hypothesis that coefficients of individual value functions are systematically associated with experiential, situational and personal characteristics of the individuals. We also obtain data on the distributions of the individual value coefficients and their interrelationships. Finally, the research applies these specifications to the retrospective prediction of transit patronage in a situation of rapidly changing transit system characteristics from 1974 to 1977. (Author/TRRL)

Louviere, JJ (Iowa University); Kocur, G (Dartmouth College)  
**Transportation Research. Part A: General** Vol. 17A No. 5, Sept.  
 1983, pp 363-373, 2 Fig., 2 Tab., 26 Ref.

**ACKNOWLEDGMENT:** TRRL (IRRD 273583)  
**ORDER FROM:** ESL

#### 42 382748

##### **TRANSPORT POLICY DEVELOPMENT IN AMMAN, JORDAN AND BAHRAIN**

Recently executed transportation studies in Amman, Jordan and Bahrain provide an opportunity to compare and contrast the development of transport policy in two Middle Eastern urban areas. Both have similarly structured transport systems based entirely on roads. In addition to private vehicles, public transport is available in the form of publicly and privately operated scheduled bus services, shared taxi services, call taxis, and works and school bus services. In Amman, 60% of the trip making was by public transport. Car ownership was low and forecast to increase only modestly, while the scope for improvement of the road system was limited both by the topography and the availability of funds. The populace was also used to riding buses and shared (servis) taxis. Some restraint of private vehicle usage was advocated, but the main thrust of the strategy was the development of a greatly enhanced bus system. The services suggested ranged from high capacity double-deckers performing a line-haul function to micro-buses penetrating dense urban areas. A corollary of the bus system development was the restriction of the shared taxi services to narrow, hilly, tortuous routes of low passenger demand not suitable for bus operation. In Bahrain, 75% of the trip making was by private transport. Car ownership is modest but forecast to rise appreciably. The bus system has a low-image being patronised mainly by expatriate labourers. The shared taxi service performs only a very modest role, mainly for poorer Bahrainis. Road building is feasible, both topographically and given the funds likely to be available. The main thrust of the strategy here, therefore, is development of the road system, coupled with some small degree of central area parking restraint, and the development of some special services to cater for the restrained demand. (Author/TRRL)

Developing Countries. Proceedings of Seminar G held at the PTRC Summer Annual Meeting, University of Warwick, England, 4-7 July 1983.

Coombe, RD (Halcrow Fox and Associates) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P237, 1983, pp 127-138, 3 Tab., 5 Ref.**

**ACKNOWLEDGMENT:** TRRL (IRRD 273955)  
**ORDER FROM:** Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 42 382757

##### **BAGHDAD COMPREHENSIVE TRANSPORTATION STUDY: PROJECT OVERVIEW**

The Iraq government adopts a system of centralised planning and the Transport and Communications Commission of the Ministry of Planning is responsible for the overall budgetary control of transport sector development whatever ministry undertakes it. Baghdad is a rapidly growing city (expected 2000 population 8 M) with considerable scope for developing its road, rail, water and air transport. It was for these reasons that the Ministry of Planning commissioned a detailed and comprehensive transportation study in 1979 in order to plan a co-ordinated transport system for Baghdad. The Baghdad Comprehensive Transportation Study (BCTS), which had 1990 and 2000 as its main planning years, was accompanied by a short term area traffic control study (atc stage 2) involving 150 signal controlled intersections. The general objectives of the study took account of the need to develop in Iraq the skills and expertise to carry out transportation studies. They also placed considerable emphasis on the establishment of a sound data base of traffic, land-use and socio-economic data and extensive surveys were undertaken. These surveys and the development of the transportation model are described in the following two papers. The results of the study will be used by the government to reconsider their allocation of investment in the transport sector. (Author/TRRL)

Developing Countries. Proceedings of Seminar G held at the PTRC Summer Annual Meeting, University of Warwick, England, 4-7 July 1983.

Ghazoul, KN **Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P237, 1983, p 335**

**ACKNOWLEDGMENT:** TRRL (IRRD 273969)  
**ORDER FROM:** Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 42 382758

##### **BAGHDAD COMPREHENSIVE TRANSPORTATION STUDY DATABASE**

The vast scale of potential development in Baghdad, with a possible investment of US \$12000 million between 1980 and 2000, demanded that the transportation planning had a large and reliable database. It was necessary for the database to cover land use and socio-economic data in addition to traffic information. Extensive surveys were carried out and the database was established on the computer system at the national computing centre. Twelve different surveys were carried out covering the complete range normally associated with studies of this sort. The surveys were very large: including 17000 home interviews, 30000 roadside interviews, 38000 public transport interviews, 8000 employment interviews, 4000 goods vehicle interviews. The scale of the surveys added to the many other problems associated with carrying out surveys in Baghdad and meant that the data collection and data processing phases occupied 18 months of the study in Iraq. Specific difficulties such as sample selection were associated with each of the surveys whilst others including quality control were general to all. The results from the various surveys showed that some had not produced returns consistent with the effort involved in conducting them. (Author/TRRL)

Developing Countries. Proceedings of Seminar G held at the PTRC Annual Meeting, University of Warwick, England, 4-7 July 1983.

French, GH Munro-lafon, J (Scott Wilson Kirkpatrick & Partners) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P237, 1983, pp 337-350, 3 Fig.**

**ACKNOWLEDGMENT:** TRRL (IRRD 273970)  
**ORDER FROM:** Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 42 382759

##### **BAGHDAD COMPREHENSIVE TRANSPORTATION STUDY MODEL CALIBRATION AND MODAL SPLIT**

One of the main aims of this study was to develop a computerised transportation model capable of simulating travel within the study area. This model was used to synthesise the travel demands and patterns in future years and evaluate alternative transportation strategies which might cope with this demand. The modelling work was based on the data collected in the traffic surveys described earlier. The main transportation model was the city model which takes account of the fact that some trips may be captive to one mode of travel thus reducing the number of trips which have a true choice of mode. In the trip generation phase of the model the household categories chosen covered five different variables including household density. This variable was only included when it became apparent that the other four variables could not satisfactorily reproduce the observed number of trips in several areas of the city. In the base year situation in Baghdad there were five separately identifiable modes of transport that each carried more than 10% of the weekday passenger movements. The calculation of the modal split functions included only those trips which were surveyed as having a true choice of mode. The limited number of such choice trips in Baghdad made the process of modal split calibration even more difficult. The final test applied in each case was to assign the synthesised matrices to the appropriate network and compare the flows with the observed counts. As expected there were some differences at particular points but overall the results were in sufficiently close agreement to be within acceptable confidence limits. (Author/TRRL)

Developing Countries. Proceedings of Seminar G held at the PTRC Summer Annual Meeting, University of Warwick, England, 4-7 July 1983

French, GH Parker, RM (Scott Wilson Kirkpatrick & Partners) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P237, 1983, pp 351-365, 7 Fig., 5 Tab.**

**ACKNOWLEDGMENT:** TRRL (IRRD 273971)  
**ORDER FROM:** Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

42 382773

**GRAPHICS IN AN URBAN AND TRANSPORT PLANNING RESEARCH ENVIRONMENT**

The use of computer graphics as a research tool in urban and transport planning, using both mainframe systems and microcomputers is demonstrated. Graphics is used to display data relating to urban population characteristics, and is also used as an aid in the analysis and modelling of urban land use and transport systems, energy consumption, and environmental impacts. Census-type data provide the major source of information on urban populations for planners, and the use of graphics techniques for display in an interactive microcomputer environment, is shown to provide a powerful new medium for assimilating and understanding these data. (Author/TRRL)

First Australasian Conference on Computer Graphics, Sydney, 31 August—2 September 1983. Prints of Papers.

Taylor, MAP Crawford, JR (Commonwealth Scientific & Indus Res Org, Australia)  
Institution of Engineers, Australia Preprint No. 83/10, Sept. 1983, pp 13-17, 11 Fig., 11 Ref.

ACKNOWLEDGMENT: ARRB (IRRD 266634), Australian Road Research Board  
ORDER FROM: Institution of Engineers, Australia, 11 National Circuit, Barton, A.C.T. 2600, Australia

42 382778

**DIRECTIONS FOR TRANSIT: A REGIONAL TRANSPORTATION INVESTMENT PERSPECTIVE**

In the Victoria area of BC, a study has been completed of total transportation requirements over the next 20 years which provides a useful perspective for the future role of transit. The travel forecasting and costing process has provided for the first time an analysis of present and future costs of transportation borne by three levels of government and by residents of the region as users of the system. One of the major findings of the transportation cost assessment is that little or no economic benefit can be established for further long-term region-wide expansion of the transit system in the Victoria metropolitan area. An examination of present transit and automobile costs at the household level emphasizes the high cost of providing transit service. Increased automobile ownership, suburbanization and public and political attitudes towards transit are some of the factors that have contributed to the changing role of transit. The decline of transit economic advantage is discussed in terms of historic cost trends and in comparison to other transportation costs. Determined efforts to minimize cost increases and to improve productivity in the transit system are needed to reverse the current trends and to maintain or improve the area of effective transit advantage. Only then an expanded role of transit can be justified. (Author/TRRL)

Proceedings of the 1982 Roads and Transportation Association of Canada Conference, Halifax, Nova Scotia.

Langley, DW Cherian, V (British Columbia Capital Regional District)  
Roads and Transportation Association of Canada Proceeding Sept. 1982, 26p, 8 Fig., 3 Tab., 7 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273463), Roads and Transportation Association of Canada  
ORDER FROM: Roads and Transportation Association of Canada, 1765 St Laurent Boulevard, Ottawa, Ontario K1G 3V4, Canada

42 382802

**THE ECONOMICS AND PLANNING OF TRANSPORT**

This book presents the elementary theory of economics and applies it to the transport sector. The demand for and supply of transport are discussed together with pricing policy; the concept of marginal cost pricing is explained by using actual figures in pounds and pence. The urban traffic congestion problem is treated from the economist's viewpoint, stressing the case of road passenger transport and the way it approaches the pricing of its services. The subject of subsidy in transport is examined and the question of worsening rural transport is highlighted. An up-to-date assessment of the role of cost-benefit analysis is presented as part of investment appraisal. Included are chapters on the role of government and transport planning. Details are given of the financing and control of local government and nationalised industries. The structure of the Department of Transport is outlined. The concept of free market economy, departures

from it and their significance in the international context are dealt with. A discussion is included on the progress towards the common transport policy of the EEC. (TRRL)

Bell, GJ (Central Manchester College); Blackledge, DA (West Midlands Passenger Transport Executive); Bowen, PJ (Central Manchester College)  
Heinemann (William) Books Limited Monograph 1983, 248p, Figs., Tabs., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 273702)  
ORDER FROM: Heinemann (William) Books Limited, 10 Upper Grosvenor Street, London, England

42 382806

**ROMSEY AREA TRANSPORT STUDY**

This study contains nine chapters dealing with: 1, Introduction and objectives; 2, Romsey-the study area; 3, Household survey; 4, Vehicle and pedestrian surveys; 5, Commercial option; 6, School transport; 7, Social needs; 8, Conclusions; and 9, Developments since the study. (TRRL)

Hampshire County Council Monog No Date, 72p, Figs., Tabs.

ACKNOWLEDGMENT: TRRL (IRRD 273742)  
ORDER FROM: Hampshire County Council, Winchester, Hampshire, England

42 382813

**EVALUATING EXTENSIONS TO THE SANTIAGO UNDERGROUND SYSTEM**

The Santiago underground system (Metro) consists at present of 2 lines with 25 km railway and 35 stations; although the original plan (approved in 1969) considered 5 lines and 105 km of rail. Due to the considerable changes experimented by Santiago in the last decade, the government has decided to reconsider the original plan. This decision is further justified by the fact that today first-hand information about construction and operating cost of the system is available. This paper summarises the objectives, methodology and conclusions of a recent study where several alternatives of extension of the system were evaluated. The study used state of the art models and evaluation techniques and the paper puts special emphasis on discussing their relevance to developing countries. (Author/TRRL)

Developing Countries. Proceedings of Seminar G held at the PTRC Summer Annual Meeting, University of Sussex.

Fernandez, JE Coeymans, JE Ortuzar, JJ (Pontifical Catholic University, Chile) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* 1983, pp 115-125, 1 Fig., 9 Tab., 8 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273954)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

42 382815

**THE CITY IN WEST EUROPE**

Chapter 5 of this book deals with the demand for transport in cities and describes a range of possible solutions to this demand. When planning for private transport these solutions can be: policies of accommodation (construction of ringways and radial roads), policies of restraint (prohibition of car access to limited areas and dedication of these areas to pedestrian use and restraint on parking), and policies for alternative private transport (pedestrianization, use of bicycles, hired cars and taxis). Solutions are outlined for public transport (railway and bus systems) planning, while the problems and advantages of an integrated transport system are described. (TRRL)

Burtenshaw, D (Portsmouth Polytechnic, England); Bateman, M (Portsmouth Polytechnic, Department Of Geography); Ashworth, GJ (Groningen University, Netherlands)  
Wiley (John) and Sons, Limited Monograph 1981, 340p, Figs., Tabs., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 273264)  
ORDER FROM: Wiley (John) and Sons, Limited, Baffins Lane, Chichester, West Sussex PO19 1UD, England

42 382816

**RAPID TRANSIT IN VIENNA**

A description is given of progress in the building of Vienna's underground railway system-the U-bahn. The first phase which includes the U1, U2 and U4 lines is completed and the second phase comprising the U3 and U6 should be completed by 1990. The new stations and trains are briefly described and illustrated. The underground system is only now being constructed despite plans being made as far back as the 19th century. An outline is given of the historical reasons for the delay in proceeding with construction (i.e. Lack of money, building of an alternative stadtbahn and investment in the tramways). As a result of the U-bahn system several areas of the city have been pedestrianised and have become more attractive areas to live, work and shop in. (TRRL)

Neves, J *Modern Railways* Vol. 40 No. 422, Nov. 1983, pp 581-583, 1 Fig., 5 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 273168)

ORDER FROM: Allan (Ian) Limited, Terminal House, Shepperton TW17 8AS, Middlesex, England

42 382825

**A COMPARISON OF METHODS FOR CODING ADDRESSES IN TRAVEL SURVEYS**

This report considers six methods of coding travel survey addresses with locational references suitable for computer analysis. The examples are taken from the impact studies of urban rail investments in Glasgow and Tyne and Wear which were initiated by TRRL. Three are geocoding exercises based on the UK ordnance survey national grid; the remainder are concerned with coding to traffic zones or postcode areas. A comparison is made between conventional manual coding conversion procedures: postcodes to geocodes and geocodes to zone codes. The report gives conclusions on address coding methods and costs in the context of travel surveys sponsored by transport operators, local authorities and central government. (Author/TRRL)

Miles, JC Walmsley, DA  
Transport and Road Research Laboratory, (0305-1293) LR 1090,  
1983, 20p, 4 Fig., 4 Tab., 14 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273235)

ORDER FROM: TRRL

42 382842

**COMPLEX POSTAL SURVEYS IN TRANSPORT PLANNING: METHODOLOGY AND RESPONSE RATES**

The paper compares and contrasts two travel surveys using postal survey methods to elicit complex data. One group of surveys were part of a study of long distance travel in the Amsterdam-Groningen corridor in Holland. A sample of journeys over 30 km by train, bus and car was required and, because such travel represents only a small part of all travel, a choice-based sample was decided upon. The only way to collect the data economically was by post and yet the volume and complexity of the data required from each individual was very great. A multi-stage survey was undertaken with travellers by the three modes completing a short factual questionnaire. This questionnaire was processed quickly, typically within one day, to enable a sample to be selected for a follow-up questionnaire. The method allows flexibility in sample selection at the second stage-including the possibility of basing it on various criteria derived from answers to the first stage. This also enables the researcher to devise different second-stage questionnaires for, say, different journey purposes or market segments. In Holland 12 different questionnaires were used. The other study, in the West Midlands, adopted choice-based sampling for bus and rail travellers, with home interviews for car users. In the context of urban and sub-urban trips, especially at peak periods, travel times and other conditions on public transport dictated as short a first stage questionnaire as possible. The resulting data provided a base matrix of movement in the corridors of interest. Specific localities, and hence sub-sets of respondents were then selected for second-stage postal surveying to obtain more detailed data on which to calibrate travel demand models. The paper will describe the theory and methodology of this technique, analyse the response rates achieved, comment on bias and how it can be controlled and draw general lessons from the studies considered, for use in other applications. (Author/TRRL)

Transport Planning Methods. Proceedings of Seminar N held at the PTRC Summer Annual Meeting, University of Sussex, England, 4-7 July 1983.

Wicks, J Lowe, S (Mva Consultancy) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P243, 1983, p1*

ACKNOWLEDGMENT: TRRL (IRRD 273132)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

42 382843

**ESTIMATING TRIP FREQUENCY FROM TIME BUDGET DATA**

A nationwide time budget study was carried out in Finland in 1979. Around 6000 persons reported their activities, by keeping diary for two consecutive days. Respondents were asked to report travelling as a separate activity. This paper contains an analysis of the trip records found in the activity diaries. Earlier research in this field indicates that the data collection method has a significant effect on trip frequency and travel time estimates. This hypothesis is strongly supported by the results of the present analysis. A comparison between this study and a conventional travel diary survey exposes substantial differences with respect to overall trip frequency, modal split and distribution by trip purpose. The estimated average daily trip rates are about 60% higher in the activity data than in the travel diary data. The "new" trips caught in the activity diaries shift the modal distribution towards walking and cycling and the purpose distribution towards shopping and discretionary purposes. It also turns out that under-reporting in conventional studies varies with age group. The analysed trip data consists of two "types" of trips, namely reported trips and reconstructed trips. The possibility to reconstruct trips, which are not reported by the respondents is an interesting feature of activity data. From a methodological point of view the results of this study indicate that serious attention must be paid to data collection in transport surveys. The activity diary offers an alternative, but a very expensive one. The most important policy implications of the results are that the budget appropriations for pedestrian and cycling paths should be reconsidered. (TRRL)

Transport Planning Methods. Proceedings of Seminar N held at the PTRC Summer Annual Meeting, University of Sussex, England, 4-7 July 1983.

Tigerstedt, R Kaartama, M (Roads and Waterways Administration, Finland) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P243, 1983, pp 3-13, 6 Tab., 5 Ref.*

ACKNOWLEDGMENT: TRRL (IRRD 273133)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

42 382845

**THE DEVELOPMENT OF A STANDARDISED SURVEY METHOD OF LARGE SCALE APPLICATIONS IN DIFFERENT EUROPEAN COUNTRIES**

Survey methods influence the results of a survey to a greater or lesser degree, according to the extent to which the method is able to measure the phenomenon studied. An attempt was made in the Federal Republic of Germany to develop a survey method able to give valid data (which can be used for forecasting) which are also cost-effective. This survey method is able to depict the out-of-house activities of persons in a household with a great degree of precision. This survey design is based on a self-administered, mail-back questionnaire. The method can be used either locally or nationally. Even when dealing with large numbers (samples of 50000 persons or more) relatively limited funds are required, and it can be used for short periods of time or continuously over longer periods of time (even for several years). The German standardised survey design was used to see if it could be applied equally successfully in other European countries. This paper reports on the planning and realisation of this test in Austria (Graz) and in the Netherlands (Delft). In both countries, the method was used for the first time. This paper describes the preparation and realisation of the framework of the survey method, i.e.: sample, delivery and retrieval of the questionnaire, how to address and motivate respondents, follow-up method, external design of the materials, design of the questionnaire, method of noting responses, fieldwork itself. The paper discusses the experience gained with the survey design in a comparison of the three countries and shows that the attempts to transfer the method from German to foreign populations using the same method was extraordinarily successful. An



important indication of the success of this test is the fact that the return rate of 70% which was achieved in Germany was also attained in the other two countries. This paper is presented in the form of an abstract. (TRRL)

Transport Planning Methods. Proceedings of Seminar N held at the PTRC Summer Annual Meeting, University of Sussex, England, 4-7 July 1983.

Brog, W Schwertner, B (Socialdata, W Germany); Falles, K Sammer, G (Graz Technical University, Austria); Katteler, H (Inst Voor Toegepaste Sociologie, Netherlands) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P243, 1983, p17**

ACKNOWLEDGMENT: TRRL (IRRD 273135)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 42 382853

### MODELLING THE BEHAVIOUR OF PUBLIC TRANSPORT USERS; AN EMPIRICAL STUDY FOR THE CITY OF MONTREAL

In its first part, this paper compares the effects of two sources of error on the results of "all-or-nothing" assignment to public transport networks: the behavioural hypotheses concerning the choice of route by an individual trip maker, and the spatial aggregation problem which is tightly linked to the simulation of the network access. In the second part we analyse the accuracy of the behavioural hypotheses, mentioned above, for different groups of trip makers: sex and age of travellers and purpose, mode (bus, metro, metro-bus) and complexity of trips. This research was based on an empirical study using trip data provided by an o/d survey carried out in 1978 in the city of Montreal. The experiment consisted basically in comparing the "real schedules" (some 17000 morning peak individual trips) with the simulated ones provided by a minimum path algorithm. The main results obtained can be summarized as follows:- when the access problem is obviated (the access nodes of the "real schedule" are imposed to the "simulated schedule") the two types of paths match in 88% of the cases. -when the access to the network is simulated, a maximum of 40% of the simulated schedules match with the real ones. -no differences were detected in the behaviour of trip makers grouped by sex, age and trip purpose. -different behaviours were detected when trip makers were grouped by mode and trip complexity (number of public transport lines used for travelling between the origin and destination zones). (Author/TRRL)

Transport Planning Methods. Proceedings of Seminar N held at the PTRC Summer Annual Meeting, University of Sussex, England, 4-7 July 1983.

Densen, (Pontifical Catholic University, Chile); Chapleau, R (Montreal University, Canada) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P243, 1983, pp 115-128, 3 Tab., 13 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 273143)

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#### 42 382857

### THE "ZUIDVLEUGEL" STUDY, APPLICATION OF A MAJOR TRANSPORTATION STUDY IN THE NETHERLANDS

The paper gives reviews of the development and application of travel demand models for a major transportation study in the western part of the Randstad conurbation of the Netherlands. The study was carried out by the Dienst Verkeerskunde of the Rijkswaterstaat (the Traffic and Transport Engineering Division of the Ministry of Transport and Public Works). Model development was the responsibility of Cambridge Systematics Europe BV. The first part of the paper describes the aims and the context of the study in terms of the current and anticipated traffic problems of this part of the Netherlands. An advanced disaggregate model system and a novel aggregate model system were developed during the study; a short description of the assumptions of these modelling techniques is given in the paper. In the second part of the paper the application of both model systems will be extensively described. The objectives of the application will be explained with respect to national transportation plans in the Netherlands, such as the Structuurschema Verkeer en Vervoer (Traffic and Transport Structure Plan). The validation of the aggregate model system is described in detail. The correction of the aggregate model system involved the estimation of a number of factors; these are discussed in the context of

the theoretical basis of modelling in the study. The input for the first forecast for a future year (1990 in the Zuidvleugel Study) is presented as well as some first results. The traffic volumes which the modal system predict are judged to be highly satisfactory. Some results based on the disaggregate model system will also be presented. The application of this system uses the aggregation technique of sample enumeration, providing relatively quick and cheap estimates of the effects of traffic management policies. The results are presented in the form of overall numbers of trips (or tours), average trip length and overall mode choice. A few examples of predictions concerning the effects of traffic management policies are given in this paper; these have also been judged to be very reasonable. The traffic management policies that are examined concern parking regulation in a big city, improving transit access to locations of employment and changes in public transport fares. The sample enumeration system is currently being used to answer policy questions concerning traffic management; other examples of its use may thus be available for presentation in the paper. (Author/TRRL)

Transport Planning Methods. Proceedings of Seminar N held at the PTRC Summer Annual Meeting, University of Sussex, England, 4-7 July 1983.

Vanes, SM Feijen, B (Ministry of Transport & Public Works, Netherlands) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P243, 1983, pp 163-175, 2 Fig., 5 Tab., 4 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 273148)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 42 382858

### MODEL TRANSFER USING DATA FROM SEVERAL SOURCES

The paper describes the methods that have been developed to transfer the Zuidvleugel models to the Utrecht area. A novel feature is that the transfer will be based on both home interview and "choice-based" (road and train) surveys. The concept of transferability has been much discussed in recent literature. The study is carefully designed to make an important contribution to these discussions. Data collection methods chosen are a home interview of 1000 households, "number-plate" road surveys and train surveys, which are combined to obtain the most cost-effective modelling, but require separate and detailed treatment of their inherent biases. Estimation methods appropriate for deriving models from combined data sets are described. Finally, consideration is given to the appropriate tests of transferability to be made in the study. (Author/TRRL)

Transport Planning Methods. Proceedings of Seminar N held at the PTRC Summer Annual Meeting, University of Sussex, England, 4-7 July 1983.

Daly, A Gunn, H (Cambridge Systematics Europe); Barkey, P Pol, H (Dienst Verkeerskunde Rijkswaterstaat) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P243, 1983, pp 177-189, 1 Tab., Refs.**

ACKNOWLEDGMENT: TRRL (IRRD 273149)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 42 382861

### FORECASTING ACCURACY, TRANSFERABILITY AND UPDATING OF MODAL CONSTANTS IN DISAGGREGATE MODE CHOICE MODELS WITH SIMPLE AND COMPLEX SPECIFICATIONS

This paper examines the forecasting accuracy and transferability of "simple" and "complex" work trip mode choice models in addition to presentation of a simple and efficient procedure for updating alternative specific constants. The "simple" models contain only the total travel time and cost variables in addition to the alternative specific constant(s). Predictions from the "simple" models are compared to predictions from the "complex" mode choice models which include also several socio-economic variables. The results show that the simple models are no worse and, in fact, are often better predictors than the complex models. Both types of models predict poorly if the modal shares in the prediction sample differ substantially from those used in the sample for model estimation. This problem is resolved after modal constant(s) is updated; then both "simple" and "complex" models transfer remarkably well. (Author/TRRL)

Transport Planning Methods. Proceedings of Seminar N held at the PTRC Summer Annual Meeting, University of Sussex, England, 4-7 July 1983.

Deibbrand, K. Talvitie, A. (State University of New York, Buffalo) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P243, 1983, pp 217-228, 1 Fig., 8 Tab., 5 Ref.*

ACKNOWLEDGMENT: TRRL (IRRD 273152)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

42 382863

**CAR AVAILABILITY AND MODE CHOICE: A DISCUSSION PAPER**

A number of urban transport studies have shown the overwhelming importance of household car availability as a variable in determining whether journeys are made by non-car modes, particularly bus. But few studies have attempted to explain the detailed choice processes involved and therefore the extent to which their results are accurate and can be influenced by policy. This lack of explanation and understanding has meant that the concept remains somewhat confusing both to professional transport planners and members of the public who are asked about it in surveys. This paper aims to discuss four main aspects of the car availability decision process: (I) the likely accuracy of survey data; (II) the allocation and/or transferability of household cars between the members of the households; (III) the characteristics of particular journeys which influence the significance of car availability in modal choice the influence of the car availability concept on car passenger travel. The paper also attempts to draw some general conclusions on the implication for further surveys and analysis using the car availability concept. Some new evidence is presented based on recent surveys (both qualitative and quantitative) carried out in South Yorkshire. (Author/TRRL)

Transport Planning Methods. Proceedings of Seminar N held at the PTRC Summer Annual Meeting, University of Sussex, England, 4-7 July 1983.

Bailey, JM (Oxford University, England) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P243, 1983, pp 239-255, 2 Fig., 7 Tab., 5 Ref.*

ACKNOWLEDGMENT: TRRL (IRRD 273154)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

42 382865

**A REVEALED IMPORTANCE ELIMINATION-BY-ASPECTS MODEL OF MODE CHOICE**

Over the last decade considerable development in the modelling of mode choice has taken place. This development has been based primarily on one model: the compensatory logit model. Recently, however, a number of studies have attempted to broaden the modelling base by investigating some non-compensatory models. These developments have however been limited by their reliance on data that contains both interviewees' measures of the importance placed on each attribute and the level of satisfaction gained from the attributes describing each alternative. This paper therefore presents a non-compensatory elimination-by-aspects model that requires only estimates of the level of satisfaction gained from each attribute as input into the calibration procedure. The model is applied to a study of mode choice between rail and automobile trips into the central business district of Melbourne. (Author/TRRL)

Transport Planning Methods. Proceedings of Seminar N held at the PTRC Summer Annual Meeting, University of Sussex, England, 4-7 July 1983.

Young, W (Monash University, Australia); Brown, HP (Melbourne University, Australia) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc Volume P243, 1983, pp 285-298, 3 Fig., 5 Tab., 13 Ref.*

ACKNOWLEDGMENT: TRRL (IRRD 273157)

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42 384605

**SURVEY DOCUMENTATION FOR THE 1983 FOLLOW UP TO THE 1976 BANBURY ACTIVITY-TRAVEL STUDY**

The repeat household study reported was conducted within a fixed household sample from the previous (1976) study. The sample of addresses drawn then is being re-used, though the number has been reduced. The follow-up survey aims to collect data similar to and comparable with that of the previous study. Questionnaires and fieldwork procedures have however been redesigned, as described in this paper. (TRRL)

Dix, MC

Oxford University, England TSU 216/RN, Apr. 1983, 20p, 2 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 274582)

ORDER FROM: Oxford University, England, Transport Studies Unit, 11 Bevington Road, Oxford OX2 6NB, England

42 384612

**A BANBURY RE-INTERVIEWING SURVEY: OBJECTIVES, PILOT WORK AND LARGER-SCALE OPTIONS**

In autumn 1976 a detailed study of household activity-travel patterns was conducted in Banbury, a medium sized market town in Oxfordshire. The study was built around self-completion diaries distributed to a random sample of addresses, providing a single cross-sectional description of travel behaviour among the sample of households. A detailed landuse survey and location geo-coding scheme was also built up. This paper summarises the design and methodology of the survey. (TRRL)

Dix, MC

Oxford University, England TSU 200/RN, 1983, 16p, 7 Fig., 4 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 274583)

ORDER FROM: Oxford University, England, Transport Studies Unit, 11 Bevington Road, Oxford OX2 6NB, England

42 384626

**REVIEW OF POSSIBLE EFFECTS OF SOME SELECTED FEDERAL ACTIONS ON NEW TRANSIT PRODUCT INTRODUCTION**

This study examined fifteen concepts by which the Urban Mass Transportation Administration (UMTA) could strengthen its role in the technology deployment phase of the innovation process. From the in-depth discussions based on a questionnaire with nine members of the transit industry, the transit operators identified uncertainty over future Federal design and performance guidelines as the single major barrier to new product introduction. In contrast, the transit suppliers cited uncertainties over the stability and volume of annual product sales, opportunity costs of foregone investments, and lowest-bid procurement as their barriers. Of the fifteen concepts proposed to overcome the identified barriers, six were ranked as highly feasible and effective. They were: 1) standard set of performance guidelines; 2) lowest lifecycle cost procurements; 3) Federal grants for the purchase and test of limited production quantities; 4) coordination of transit products orders by UMTA; 5) use of Federal capital incentives to influence local authorities to adopt regulations to encourage transit use; and 6) formation of a transit operators and supplies committee to facilitate greater cooperation in the development cycle. In-depth analysis was performed on the six selected concepts and examples of UMTA programs incorporating recommended concepts were discussed.

Chin, DK

Onyx Corporation, Urban Mass Transportation Administration Final Rpt. UMTA-MD-06-0032-79-1, July 1979, 102p Contract DOT-UT-80023, Task I

ORDER FROM: NTIS

42 384656

**TRANSPORTATION SYSTEM PLANNING**

This Circular contains a statement on Surveillance and Monitoring in Statewide Transportation Planning and a short paper on The Role of Strategic Planning in the Program of a State Transportation Agency followed by a series of brief summaries of multimodal planning efforts in a variety of areas in several states. Monitoring and surveillance are important, but difficult, elements in statewide transportation planning. Data collection can be expensive and it can be complicated to establish a process that produces relevant information in a timely manner. The goal is to measure how well the transportation system is performing, how it is

changing, how it is affected by external factors, and to consider the implications of available information on decision-making. Strategic planning must involve futurism (a look as far ahead as possible), an objective, and a means by which the objective can be realized. Topics in case studies involve a Statewide Transportation Master Plan, transit corridors, grain movements, ports, grade crossing improvements, intercity passenger travel, and multimodal planning.

Creighton, RL (Creighton (Roger) Associates, Incorporated)  
 Transportation Research Circular No. 268, Jan. 1984, 8p

ORDER FROM: TRB Publications Off

**42 384660**  
**URBAN TRANSPORTATION PLANNING IN THE U.S.: AN HISTORICAL OVERVIEW**

This report provides an overview of approximately 50 years of urban transportation planning history. It begins with developments in highway planning in the early 1930s and ends with the shift to decentralization of decision making authority in the 1980s. The key event during this period was the Federal-Aid Highway Act of 1962 which created the federal mandate for a continuing, comprehensive urban transportation planning process carried out cooperatively by states and local governments. Planning processes and procedures evolved over the years as new issues and concerns were raised and changes in attitudes and priorities occurred. Planning processes have become more complex and sophisticated but have retained many of the earlier elements and objectives. The evolution is still continuing with the objective of improving procedures and institutions that are adapted to the needs and concerns of today's planners, citizens and decision makers.

Weiner, E  
 Asst Secretary for Policy & International Affairs, Office of the Secretary of Transportation, (P-30) DOT-I-83-43, Aug. 1983, 115p, Refs.

ORDER FROM: NTIS

**42 384885**  
**TEN YEARS OF PLANNING BY THE PARIS TRANSPORT AUTHORITY [10 ANS DE PLANIFICATION A LA REGIE AUTONOME DES TRANSPORTS PARISIENS]**

In 1972 Paris Metro decided to set up a corporate planning system and to use it as a major instrument of management. After describing the various stages of procedural development, this article examines the main features of the system and the changes that are taking place. [French]

Genet, A *Revue Generale des Chemins de Fer* Nov. 1983, pp 699-702

ACKNOWLEDGMENT: International Union of Railways, BD  
 ORDER FROM: ESL

**42 384891**  
**ASSESSMENT OF THE SAN DIEGO LIGHT RAIL SYSTEM**  
 This report documents an assessment of the San Diego Light Rail Transit (LRT) system which began revenue service on July 26, 1981. The objectives of this assessment are: to document early planning leading to the decision to build, essentially without federal funding; to document the system that was built entirely with limited state and local funds; to assess the performance and operation of this system; to assess the applicability to other cities of this low-budget approach for providing rail transit service; and to provide urban planners with information to assist them in determining whether this type transit can meet their specific needs. This report is limited to an assessment of the original first phase system which began operation in July 1981. The San Diego LRT (San Diego Trolley) operates both on city streets and on the San Diego and Arizona Eastern Railway dedicated right-of-way. The 25.5 km system was built at a cost of \$85.8 million, all at-grade and runs from San Diego to San Ysidro at the border with Mexico. In this report, the San Diego trolley is described and its technology assessed—cars, track, power and facilities. The assessment of operations includes patronage, mixed traffic, single tracking, and staffing. Reliability, energy consumption and safety are included in the performance assessment. Economics are addressed in terms of capital costs, operating costs, and comparisons with other systems. The project history is described, including organization, planning and system implementation. Information and data were collected from literature surveys, site visits, interviews, and reviews of operating and maintenance logs.

McGean, TJ Haussmann, JG Lea (ND) and Associates, Incorporated  
 Final Rpt. UMTA-IT-06-0248-84-1, NDL 41-VI, Nov. 1983, 218p Contract DTUM60-81-C-71089  
 ACKNOWLEDGMENT: International Union of Railways, BD  
 ORDER FROM: NTIS PB84-163245

**42 384901**  
**VALUE OF TIME ESTIMATION. WORKING PAPER**  
 Statistical aspects of procedures for the evaluation of savings in travel time were investigated on the basis of stated or revealed preference data. Methods of obtaining models using the data available were developed and an example illustrated the greater potential of the more recent probability choice models over the older "Beesleygraph" approach. Model appraisal was considered from the aspects of internal consistency of the complete model with the data from which it has been estimated and the performance of the fitted models. Limitations of the models were considered and a comparison of maximum efficiency was made. Designs suitable for revealed preference analysis were found not to be best for transfer pricing experimentation and vice versa. Information on sample size and composition, its accuracy, and the potential for reducing samples was also considered.

Gunn, HF  
 Leeds University, England, Department of Transport, England LU-ITS/WP-157, June 1981, 56p

ORDER FROM: NTIS PB84-143858

43 345743

**TRANSIT ASSISTANCE ALLOCATION: FURTHER RESEARCH FINDINGS**

Earlier work by the author published in this journal on the allocation of transit operating assistance at the state level in the US is extended. As before, available resources are first distributed to three categories of transit systems: large urban, small urban and rural. The intra-category allocation now considers ridership and revenue miles using a multiplicative (Cobb-Douglas) function, rather than an additive relationship. The result is that systems which score high on one measure but low on the other receive less funds than systems with output more in line with specified weights for the measures. A comparative application of the two versions to data on small urban systems within the state of Iowa illustrates the advantage of the multiplicative model.(a) (TRRL)

Forkenbrock, DJ (Iowa University) **Transportation Research, Part A: General** Vol. 15A No. 5, Oct. 1981, pp 363-365, 2 Tab., 2 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 257369)  
ORDER FROM: ESL DOTL JC

43 380122

**AMTRAK'S INCOME DIVERSIFICATION PROGRAM: POTENTIAL FOR INCREASED EARNINGS AND REDUCED FEDERAL FINANCIAL SUPPORT**

In 1981, the Congress encouraged Amtrak to embark on an income diversification program to more fully use its resources through agreements with the private sector. The objective was to increase Amtrak's revenues and minimize its Federal subsidies. GAO was requested to review the program and found that: Amtrak is operating the program within the framework of the law, which gives it considerable flexibility; to date, the program's scope has been limited primarily to the overhaul and assembly of passenger cars of mass transit systems, but potential exists for increased earnings; it is too early to assess the potential overall effect the program might have on Amtrak's need for Federal subsidies. GAO raises some matters for congressional consideration that relate to the disposition of diversification program profits and improved program reporting. GAO also makes a recommendation to the President of Amtrak aimed at improving program administration.

General Accounting Office GAO/RCED-84-41, Oct. 1983, 40p, 2 App.

ORDER FROM: GAO-Document Handling & Info Services Facility, P.O. Box 6015, Gaithersburg, Maryland, 20760

43 380182

**SUPPORT FOR A LOCAL TRANSIT TAX**

Survey data from a small, blue collar, midwestern U.S. city are analyzed to identify the factors that influence support for a local tax earmarked for transit. In Council Bluffs, Iowa, a telephone survey was carried out to measure willingness to pay a proposed two mil property tax for transit. Two complementary multivariate techniques, Multiple Classification Analysis and Automatic Interaction Detector, are applied to measure the roles of a series of user and nonuser benefits in support for the tax. The benefits affecting support most strongly proved to be those accruing to nonusers—specifically, the beliefs that transit contributes to cleaner air, stimulates business within the city, and helps the poor to find or keep jobs. The belief that urban government is performing well also strongly affects support. Personal use of transit, use by other members of one's household, and the view that transit is a back-up transportation mode have a very minor effect on support. The conclusion is social objectives as well as performance measures to ensure continued support.

Forkenbrock, DJ Stoner, JW  
Iowa University Working Paper 65, May 1983, 24p, 3 Tab., 14 Ref.

ORDER FROM: Iowa University, Institute of Urban and Regional Research, N246-OH, Oakdale, Iowa, 52319

43 380194

**FINANCIAL PLANNING FOR THE GREEN BAY TRANSIT SYSTEM: FINANCIAL OPERATIONS STUDY 1982-1986**

This report describes a transit system financial study which investigates new funding alternatives to offset the potential reduction of UMTA Section 5 operating assistance. A nationwide survey of 50 transit systems, operating

in urbanized areas under 200,000 population, was carried out as part of the study effort.

Kolb, R

Brown County Planning Commission, Urban Mass Transportation Administration, Office of the Secretary of Transportation Final Rpt. DOT-I-83-15, Dec. 1982, 100p Contract DOT-UMTA-WI-8007  
ORDER FROM: NTIS PB83-244996

43 380213

**IS THE SEPARATE ACCOUNTING METHOD USED BY THE DB THE RIGHT WAY TO PROVIDE BETTER INFORMATION? [DIE TRENNUNGSRECHNUNG DER DEUTSCHEN BUNDESBahn—DER RICHTIGE WEG ZU BESSERER INFORMATION?]**

The separate accounting method used by the DB is primarily designed to provide decision-makers with better information. However, the calculation of net results for the three sectors involved (infrastructure maintenance, the commercial railway and the social railway) will not make it possible for this objective to be reached if quantification covers the total costs. Determination of the contribution to cost coverage—the elements of which are easy to identify—is a better approach. [German]

Diederich, H *Internationales Verkehrswesen* Vol. 35 No. 2, 1983, pp 108-113, 13 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Tetzlaff-Verlag GmbH, Havelstrasse 9, Postfach 4006, 6100 Darmstadt 1, West Germany

43 380842

**ESTIMATING DEMANDS FOR PUBLIC GOODS. TWO FULL-SCALE, NON-HYPOTHETICAL TESTS CONCERNING A NEW LOCAL BUS LINE AND A NEW STATISTICS PROJECT [ATT MAETA EFTERFRAAGAN PAA KOLLEKTIVA TJAENSTER. TVAA FULLSKALEUNDERSOEKNINGAR AV NYA BUSSLINJER RESPEKTIVE OFFENTLIG STATISTIK]**

This study presents a method for an approximate estimation of the consumers' willingness to pay for public goods (the "interval method"). The method implies that potential consumers will actually have to pay within the limits given by their stated willingness to pay, which means that the method also offers an alternative to tax financing of public goods. In addition, the stated willingness to pay determines whether the project concerned should be carried out or not. Two non-laboratory, non-hypothetical applications of the method are reported, both of which were provided by Swedish government institutions—the opening up of a new bus line and the introduction of a new form of statistics. The results indicate that the method is practicable. In the case where the method was subjected to a complete test, involving actual production of the good and actual payments from the consumers, it turned out that the aggregate willingness to pay could be determined with good approximation. (Author/TRRL) [Swedish]

Bohm, P

Swedish Council for Building Research Monograph Rapport 12:1983, 1983, 53p, 2 Fig., 6 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 270911), National Swedish Road & Traffic Research Institute  
ORDER FROM: Swedish Council for Building Research, St. Goeransgatan 66, Box 27063, S-11230 Stockholm, Sweden

43 380864

**SERVICE LEVELS OF URBAN PUBLIC TRANSPORT [VOORZIENINGENNIVEAU OPENBAAR STADSVervoer]**

Since the middle of the sixties urban public transport no longer makes a profit. Adaptation of the tariffs to ensure a financial equilibrium is in contradiction with the aims of the traffic and transport policies. The price mechanism is ruled out consciously from social considerations for the mobility for persons without a car and to decrease the external effects of car traffic. While the price of public transport cannot work as a regulator in the allocation of governmental subsidies, the interference of the government in the service levels of public transport is inevitable. Criteria and methods for allocation of subsidies to public transport are studied and the results of the study are presented in this paper. (TRRL) [Dutch]

Vogelaar, J (Nederlands Economisch Instituut)

Colloquium Vervoersplanologisch Speurwerk Colloquium 1982, 1983, pp 795-818, 6 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 270698), Institute for Road Safety Research SWOV  
 ORDER FROM: Colloquium Vervoersplanologisch Speurwerk, P.O. Box 45, Delft, Netherlands

**43 380865**

**SERVICE LEVELS OF URBAN PUBLIC TRANSPORT. DISCUSSION NOTE [DISCUSSIEBIJDRAGE VOORZIENINGEN NIVEAU OPENBAAR STADSVervoER]**

A system to determine levels of service for urban public transport must take account of an equitable distribution of services for urban public transport. With this system the national government should retain the means of opposing undesirable developments. Subsidies for urban public transport must contribute at the same time as improvements of the physical structure; likewise more attention must be paid to (un)favourable consequences of related investments or of reorganisations of bus concerns. (Author/TRRL) [Dutch]

Degelaar, J (Rijks Planologische Dienst, Zwolle)  
 Colloquium Vervoersplanologisch Speurwerk Colloquium 1982, 1983, pp 819-824

ACKNOWLEDGMENT: TRRL (IRRD 270699), Institute for Road Safety Research SWOV  
 ORDER FROM: Colloquium Vervoersplanologisch Speurwerk, P.O. Box 45, Delft, Netherlands

**43 380866**

**THE PUBLIC TRANSPORT FIRM AS CONTRACTOR [HET OPENBAAR VERVOERBEDRIJF ALS AANNEMER VAN WERK]**

The growing subsidizing of public transport has led to the situation where there is no clear division between the responsibilities towards society and to efficiency within the public transport firm. It is suggested that the growing emphasis on the social function of public transport might have led to a loss in efficiency. In order to maximise efficiency within the constraints of the social function, in this paper the suggestion is made to let the public transport firm act as a contractor of works, while the contract contains the public transport service within an area. In doing so the government is obliged to make perfectly clear what kind of service it is willing to provide and the price. Within the public transport firm the urge towards efficiency is strengthened because the situation where the losses were subsidised has changed into a situation where the costs have to meet a contracted income. (Author/TRRL) [Dutch]

Degelaar (Studiecentrum Verkeertechniek)  
 Colloquium Vervoersplanologisch Speurwerk Colloquium 1982, 1983, pp 825-834

ACKNOWLEDGMENT: TRRL (IRRD 270700), Institute for Road Safety Research SWOV  
 ORDER FROM: Colloquium Vervoersplanologisch Speurwerk, P.O. Box 45, Delft, Netherlands

**43 380883**

**VIEWS ON TRANSIT TAX FINANCING IN THE US**

Although much has been written about the economics of transit tax financing, public views and opinions toward alternative tax sources have received comparatively short shrift. This paper examines the attitudes of transit managers as well as other political groups toward various tax sources available for financing transit services in the USA. From a survey of 129 transit officials, state fuel and vehicle registration taxes are found to be the overwhelming favorites. Administrators for large transit properties generally also favor federal income tax financing of transit, while those for smaller agencies seem to rate sales tax revenues relatively highly. Several other studies have likewise shown sales taxes to be preferred by transit officials. With the planned phase-out of federal operating assistance, it is becoming increasingly imperative that authorizing legislation be enacted allowing jurisdictions to dedicate a range of local revenue sources to transit. While perspectives on transit tax financing were found to vary somewhat among vested interests, in general there seems to be more agreement than dissension on which tax sources should be used. (Author/TRRL)

Cervero, R (California University, Berkeley) **Transportation (Netherlands)** Vol. 12 No. 1, Aug. 1983, pp 21-43, 1 Fig., 5 Tab., 25 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272388)  
 ORDER FROM: Elsevier Scientific Publishing Company, P.O. Box 211, Journal Division, 1000 AE Amsterdam, Netherlands

**43 380897**

**BUS SUBSIDY POLICY: INQUIRY NOT COMPLETED. HOUSE OF COMMONS THIRD SPECIAL REPORT FROM THE TRANSPORT COMMITTEE; SESSION 1982-82, TOGETHER WITH THE PROCEEDINGS OF THE COMMITTEE AND APPENDICES TO THE MINUTES OF EVIDENCE**

The terms of reference of the inquiry into bus subsidy policy are to examine the prevailing levels of subsidy provided to bus users in both urban and rural areas, to assess the degree to which subsidies are used for the implementation of "cheap" fares policies rather than for maintaining levels of service, and to consider the extent to which the economic and social benefits of fare subsidy policies can be identified and evaluated. Evidence is being taken on the following issues: (1) major trends in the levels of bus service provision and patronage in urban and rural areas over the past decade; (2) trends in the costs of providing these services and changes in levels of productivity; (3) respective roles of the private and public sectors in the provision of bus services, including changes brought about by the 1980 transport act; (4) financial framework within which the bus industry operates and changes that have occurred in the levels of subsidy over the past decade; (5) extent to which subsidies have been used to provide "cheap" fares rather than to maintain levels of service; (6) extent to which operators have been able to maintain unprofitable services by cross-subsidisation and whether the liberalisation measures of the 1980 Transport Act have reduced the scope for such cross-subsidisation; (7) whether it is possible to assess appropriate levels of bus subsidy taking into account the social and economic benefits which are produced; and (8) examination of alternative methods of providing subsidies to the bus industry, taking into account the effects of such alternatives on managerial decision making and incentives towards achieving increased efficiency. This report contains some of the memoranda received by the transport committee on the above issues and a list of memoranda reported to the house but not published. (TRRL)

Her Majesty's Stationery Office, House of Commons Monograph No. 285, May 1983, 131p, Figs., Tabs.

ACKNOWLEDGMENT: TRRL (IRRD 271559)  
 ORDER FROM: Her Majesty's Stationery Office, 49 High Holborn, London WC1V 6HB, England

**43 381022**

**STATE AND LOCAL FINANCING OF PUBLIC TRANSIT SYSTEMS. EXECUTIVE SUMMARY.**

This study examines sources and uses of financial support currently in use or under consideration for public transit systems in four states. The study examines the funding arrangements and institutional interactions of five transit systems in the four states. The states involved in the case studies are California, New Jersey, North Carolina, and Georgia. While all sources of funds are considered, emphasis is placed on non-Federal governmental sources. Non-government funds such as farebox revenues are examined. The uses of these funds and any usage restrictions upon particular funds are detailed in the report. The study examines the advantages and disadvantages of dedicated funding sources, farebox requirements, forecasting techniques utilized, potential additional funding sources, legal restrictions upon funds usage, and the organizational and political environment surrounding the case study systems. The results of the five transit system case studies indicate that a withdrawal of Federal operating subsidies would place severe upward pressure on transit fares. The authors point out that if transit is to maintain present levels of service, not to mention providing expanded service, then greater stability in funding sources appears to be required.

Walther, ES  
 North Carolina Agricultural and Technical State U, Urban Mass Transportation Administration Final Rpt. UMTA-NC-11-0009-83-2, A&T-TI-49-RR-82, June 1983, 46p Contract NC-11-0009  
 ORDER FROM: NTIS PB83-261057

43 381023

**STATE AND LOCAL FINANCING OF PUBLIC TRANSIT SYSTEMS**

This study examines sources and uses of financial support currently in use or under consideration for public transit systems in four states. The study examines the founding arrangements and institutional interactions of five transit systems in the four states. The states involved in the case studies are California, New Jersey, North Carolina, and Georgia. While all sources of funds are considered, emphasis is placed on non-Federal governmental sources. Non-government funds such as farebox revenues are examined. The uses of these funds and any usage restrictions upon particular funds are detailed in the report. The study examines the advantages and disadvantages of dedicated funding sources, farebox requirements, forecasting techniques utilized, potential additional funding sources, legal restrictions upon funds usage, and the organizational and political environment surrounding the case study systems. The results of the five transit system case studies indicate that a withdrawal of Federal operating subsidies would place severe upward pressure on transit fares. The authors point out that if transit is to maintain present levels of service, not to mention providing expanded service, then greater stability in funding sources appears to be required.

Walther, ES

North Carolina Agricultural and Technical State U, Urban Mass Transportation Administration Final Rpt. UMTA-NC-11-0009-83-3, A&T-TI-49-RR-82, June 1983, n.p.

ORDER FROM: NTIS PB83-261065

43 381480

**TRANSPORT FOR PLANNERS-OR THE PUBLIC?**

The problems of present day public transport are discussed and possible controls that could lead to public transport viability and profitability while preserving passenger satisfaction are considered. The author finds it difficult to reconcile certain historical aspects of transport finance such as the very large discounts given for rail season tickets, or the cross-subsidy of suburban buses out of the profitable services of the inner cities. He also finds it difficult to begrudge bus subsidy when car users are blatantly undercharged for using congested streets. The system of charging for road use which allows users to pay the same for each extra bit of road used, irrespective of whether it is in short supply, is criticised. The two solutions to the problem of public transport are said to be to rely upon administration or to allow the forces of competition to determine the quantity and quality of service supplied. The author favours the competition answer with the suggestion that there must be alongside this course of action a reform of the present inefficient method of rationing road space. (TRRL)

Hibbs, J (Birmingham Polytechnic) *Surveyor* Vol. 161 No. 4738, Apr. 1983, pp 17-18

ACKNOWLEDGMENT: TRRL (IRRD 272903)

ORDER FROM: Business Press International Limited, Surrey House, 1 Throley Way, Sutton, Surrey SM1 4QQ, England

43 381488

**DEFICIT CONTROL THROUGH SERVICE CONTRACTING**

The continuing increase in public transit costs must be checked in order for transit to control deficits and thereby maintain affordable fares, usable service levels and ridership. There is no surplus of public funding for transit; urban areas are, on the contrary, characterized by great mobility needs. Deficit control is the most critical issue facing public transportation today. Gaining control of deficits requires substantial changes. Public transit must become more open to innovative and cost effective service alternatives, and less committed to the product forms and delivery mechanisms of the present, or its decline will continue. Private transportation operators are characterized by low costs, and are being effectively used in public transportation service in many localities. The savings achieved through contracting are substantial. Through contracting, public transit agencies can reduce deficits, while continuing to provide service to the community. The public, which pays the cost in fares, taxes and service reductions, is entitled to obtain full value for that cost. It is entitled to an unencumbered consideration of cost effective transit alternatives, including service contracting.

Cox, W (Los Angeles County Transportation Commission) *Transitions* 1983, pp 21-30

ORDER FROM: ATE Management and Service Company, Incorporated, Editor, 617 Vine Street, Suite 800, Cincinnati, Ohio, 55202

43 381493

**STATE PRIORITIES IN HUMAN SERVICES TRANSPORTATION ACCOUNTING**

This issue of operating deficits has been a problem in American public transportation since its inception. Recent events have exacerbated the issue and have produced few solutions. The trend of increasing governmental involvement and increasing levels of support for the development of human services or specialized transportation has raised the issue anew. However, new federal policy has emphasized the responsibility of problem solving and decision making rests increasingly with state and local levels. The concomitant circumstance of fewer federal resources for specialized transportation sharpens the key questions: who will pay for essential transportation service? and, how much should be paid? It is only in recent years that comparable data on financial operations of public transit providers has been available nationally; it is far less available for transit operations in rural and small urban settings, particularly in human services transportation. A voluntary alliance of six states has surveyed the transportation accounting priorities, as viewed by provider agencies and state administrative agencies. Findings of the survey deal with four substantive areas: bookkeeping, billing procedures, financial accountability, and program/service accountability-as required by multiple funding agencies. Findings from the six states tend to suggest that priorities in problems uncovered and potential solutions may have applicability to other states in the U.S.

Malkowski, KW (Michigan Department of Social Services) *Specialized Transportation Planning and Practice* Vol. 1 No. 4, 1983, pp 325-338, 8 Ref.

ORDER FROM: Gordon and Breach Science Publishers Limited, 42 William IV Street, London WC2N 4DE, England

43 381528

**SHORT DISTANCE PASSENGER TRANSPORT IN THE CONTEXT OF PUBLIC TRANSPORT POLICY IN WEST GERMANY [DER OPNV IN DER BUNDES-VERKEHRSPOLITIK]**

The deficit in short distance public transport was 7,200 million DM in 1982; DB passenger transport alone accounted for 4,500 million DM. Regional passenger transport is to be integrated into an overall economic concept, the object of which is to make optimum use of available resources and design a product of maximum concentration and efficiency. Work on improvement of infrastructures will continue in an attempt to improve the organisation of surface transport. [Germany]

Dollinger, W *Nahverkehr* Vol. 1 No. 4, 1983, pp 6-9, 1 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Nahverkehr, Duesseldorf, West Germany

43 381571

**PUBLIC AND PRIVATE INVESTMENT: THE PUBLIC SUBSIDY**

Each European country has its own specific historical features, but there are some common trends which apply to most of them. In particular, public investment has fulfilled a different function in relation to road, rail, public and private transport. The report discusses public and private investment in the transportation industries.

Goodwin, PB

Oxford University, England TSU/REF-192/L, Sept. 1982, 23p

ORDER FROM: NTIS PB84-112747

43 381596

**EQUALISATION AND EFFICIENCY IN GOVERNMENT GRANTS FOR PUBLIC TRANSPORT**

Local authorities in England receive two main central government grants for local public transport: rate support grant (rsg), which is a large general grant for all services, and transport supplementary grant (tsg). The allocation of these grants to county areas requires assessments to be made of the relative spending needs or claims of each area. The principles underlying these assessments may be different. The key principle governing

the distribution of rsg is "equalisation"-that is, rsg should be distributed in such a way that it is possible for each authority to provide a common level of service for the same local tax rate. The estimated cost of the common level of service, taking into account the circumstances of each area, is called the "grant-related expenditure". A key principle increasingly advocated for the assessment of "accepted expenditure" for tsg purposes, and also for public transport expenditure guidelines, is efficiency-that is, public spending and grant should be distributed so as to maximise net social benefit from public transport. For example, the Bus and Coach Council have recently advocated this, and the Transport Act 1983 mentions that user benefits are to be taken into account in plan-making for public transport. These two principles have strong-almost consensus-support in their own circles, but they could be different. This paper will explore interpretations of the principles and possible differences between them. (Author/TRRL)

Transport Policy. Proceedings of Seminar M held at the PTRC 11th Summer Annual Meeting, University of Sussex.

Evans, A (Bristol University, England) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1983**, pp 23-38, 2 Fig., 10 Tab., 3 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273083)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**43 381600**  
**IS SLIMMER FITTER?**

Economic recession compels governments to save expenses. As public transport is state-aided, economies have to be effected in this field. As such, public transport operators are obliged to depress costs and increase proceeds. In the matter of costs, a distinction must be made between unchangeable and reducible costs. By way of a comparison with private households, ways and means for possible solutions are specified. Reference is also made to construction plans that are imposed on public transport companies by the Belgium government. A future directed policy however presupposes extra expenses with a view to a further reduction of costs in the long run. These anti-crisis-investments are necessary, if not, public transport will go on deteriorating. Besides costs, receipts should be increased by means of a psychological and commercial strategy. It is demonstrated that merely linear increase of fares has an adverse effect. The question "is slimmer fitter?" can be answered affirmatively on the understanding of a differentiated approach, as well by operators as by governments. These actions create preconditions for take-off, indispensable for prosperity of public transport as soon as an economic upward movement stands out. (TRRL)

Transport Policy. Proceedings of Seminar M held at the PTRC 11th Summer Annual Meeting, University of Sussex.

Dedgson, JS (Ministry of Communications, Belgium) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1983**, pp 77-86

ACKNOWLEDGMENT: TRRL (IRRD 273087)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**43 381608**  
**A SYSTEM FOR ALLOCATING SUBSIDIES TO URBAN PUBLIC TRANSPORT IN THE NETHERLANDS**

Since the mid-sixties, urban public transport in the Netherlands has been suffering from severe losses which, if measured as percentage of the operating costs, are among the highest in Europe. The Ministry of Transport has tried to keep a check on subsidy budgets for urban public transport by requiring all changes in operations to be submitted to its approval but this arrangement proved unsatisfactory because it called for too many details and interfered too much with local responsibilities. Now, the ministry and the local authorities are considering various allocation systems by which to quantify the appropriate level of service for each municipality and on that base calculated the deficits to be incurred, leaving to local operators the responsibility for routing and frequencies. The objectives and methodological issues were dealt with in the first phase of the study, reported on last year's summer annual meeting. In the present paper one of the selected "families of systems" the marginal benefit cost method, is elaborated. The system allocates part of the national subsidy budget in such a way that the benefit cost ratios of charges on the level of service tend towards the same value in all municipalities. Changes in the level of service are represented by changes in average frequencies and benefits are found in generalised time effects. The system is subject to a

number of constraints, ensuring continuity and equitability between municipalities. (Author/TRRL)

Proceedings of Seminar P held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

**Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982**, pp 19-29, 1 Fig., 6 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272884)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**43 381680**  
**THE ECONOMIC COLLAPSE OF PRIVATE INTERCITY OPERATORS, AND THE STRATEGY OF LARGER GROUPS**

The stage-coach industry, which is essentially composed of private companies, is suffering its deepest slump since war. A close analysis of the causes of the decay shows that the increase in oil prices account only partially for it. The adaptive policies of operators vary according to their scale. Corporate groups benefit by diversified opportunities and make strategic moves to control the whole industry. Public subsidisation is inevitable, but it can take different shapes. The recent political changes in France may accelerate the process. (Author/TRRL)

Public Transport. Proceedings of Seminar M held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Roulet, J **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982**, pp 131-139

ACKNOWLEDGMENT: TRRL (IRRD 272844)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**43 381684**  
**THE USE OF REVENUE SUPPORT IN AN AREA OF HIGH UNEMPLOYMENT**

A supplementary submission was made to the Department of Transport in July, 1980 as part of Durham County Council's 1981/82 transport policy and programme. This requested additional transport supplementary grant to assist bus users in Derwentside district following the closure of Consett steelworks. This followed an indication by the Department of Transport that they would look favourably at an application for additional revenue support for Derwentside. The purpose of this additional support was not only to ease the burden of fares within the district but also to give special attention to the needs of people who travel to places outside the area. Although most of the district relies on the service provided by Northern General Transport there are also eight independent operators covering eleven routes. In attempting to break even, Northern's fare scales are much in excess of the fares in Tyne and Wear County. The low fare scales in Tyne and Wear require considerable financial support, in September 1981 this was reported to be in the order of £1M per week. Passengers using cross-boundary services are charged at the Northern scale in Derwentside and lower Tyne and Wear scale in the PTE Area. The request for additional transport supplementary grant was successful and £356000 at out-turn prices, was made available to assist bus services in Derwentside district. It was considered that the money should be spent in the following ways: (a) a package of reduced fares estimated to cost £266000 which included: (I) monthly season tickets, (II) town tickets in Consett and Stanley, (III) job-seeker tickets for the unemployed, (IV) cheap day returns between selected points. (b) revenue support to maintain bus services in Derwentside district estimated at a cost of £90000. This was essential to retain adequate levels of service to enable passengers to make use of the fares package. The expenditure was approved by Durham County Council's Environment Committee on 9th June 1981. The reduced fares scheme commenced on Saturday, 18th July, along with bus service revisions in the Derwentside area. In the paper on the reduced fares package it is intended that sufficient details should be provided to identify the scheme from its emergence as a package to the end of the first three months of the proposals. Explanations are given of the techniques used to identify the use being made of the tickets. It should be emphasised, however, that any calculations used to determine the distribution of the revenue support between operators will not be published. This would break the guarantee of confidentiality as the data is of considerable commercial significance to each operators. (Author/TRRL)

Public Transport. Proceedings of Seminar M held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Hamilton, TD Warburton, S (Durham County Council) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982**, pp 179-191, 6 Tab., 6 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272848)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 43 382237

##### **FINANCING PUBLIC TRANSIT: RECENT EFFORTS TO ENACT DEDICATED REVENUE SOURCES AND OTHER PUBLIC AND PRIVATE SECTOR INITIATIVES**

This report contains results of a national canvass of actions taken since January 1981 to enact dedicated taxes that enable transit operating agencies and state and local governments to have stable sources of financing for public transportation. It was found that a number of states and localities have also increased their support for transit from general revenue sources. Dedicated tax sources enacted were property-related (15), sales (14), auto-related (2) and other (3). The report cautions on special factors which can affect conclusions to be drawn from reported results. There is a section which summarizes efforts to enact dedicated transit taxes by UMTA regions. Finally, a number of innovative financing approaches involving public/private initiatives are reported. These include sale/leaseback transactions, revenue bonds, joint ventures, revenue anticipation notes, contracted services, competitive services, public/private collaboration in operations and planning, and student fees.

Parker (Jeffrey A) Final Rpt. UMTA-DC-06-415, Sept. 1982, 35p, 13 Ref.

ORDER FROM: Parker (Jeffrey A), 5224 42nd Street, NW, Washington, D.C., 20015

#### 43 382586

##### **NEW YORK'S MTA RAISES \$8.5 BILLION FOR MASS TRANSIT**

Metropolitan Transportation Authority, umbrella organization for New York City's public transit and commuter railroad operations, as well as its Triborough Bridge and Tunnel Authority, developed a 5-year capital program costing \$8.5 billion which was undertaken in 1982. Goal was overcoming long-term capital deficiencies and covers purchase of new equipment and rehabilitation of tracks, signals, structures, stations, shops, yards and power supplies. Innovative financing has to be developed, in part because New York State and New York City had their own fiscal problems. Studies by consultants and MTA management found deterioration due to a long-term policy of keeping fares low and channeling any capital into new construction, rather than maintaining existing works. State and City gave up direct control of MTA capital spending. New funding sources include revenue bonds, state service contract bonds, commuter revenue bonds safe harbor leasing, along with funds Federal, City, and Port Authority of New York and New Jersey sources. Also permitted are vendor financing and negotiated contracts.

Morrison, A **Civil Engineering** Vol. 53 No 7, July 1983, pp 42-45, 2 Phot.

ORDER FROM: ESL

#### 43 382609

##### **STATE AND LOCAL GOVERNMENTAL RESPONSES TO INCREASED FINANCIAL RESPONSIBILITY FOR PUBLIC TRANSIT SYSTEMS**

The original objective of the present research was to examine and assess the responses of selected state and local financial structures which support public transit and of the associated public transit systems to the phased withdrawal of federal operating assistance. While a phased withdrawal did not occur, the passage of the Surface Transportation Assistance Act of 1982 (STAA) did place caps upon the amount of federal transit assistance which could be used for operating subsidies and altered the method of disbursement of federal transit capital assistance funds. However, the full impacts of these changes in the federal transit assistance program have not been realized by all the respondents examined. Additionally, the impacts of the changes in the federal program are interwoven with effects of economic recession, tight state and local budgets and a variety of local phenomena which exist independently of a changing federal transit program. The report addresses the impacts of the STAA in all cases where these impacts

have been examined by the respondent. STAA induced changes are separated from changes which derive from other causes. Every effort has been made to associate particular alterations in the financial structures and in the other factors examined with a particular causative process. This report examines by in-depth personal interview, the particulars of the financial structures supporting public transit in five states and the circumstances of six public transit providers located in those states. The perspective taken in the study is that of a financial manager confronting a set of laws, rules and regulations which direct and confine the tasks of financing a public transit system.

Walther, ES

North Carolina Agricultural and Technical State U, Urban Mass Transportation Administration Nov. 1983, 184p Contract NC-11-0012  
ORDER FROM: NTIS PB84-154343

#### 43 382716

##### **AN INTEGER GOAL PROGRAMMING MODEL FOR SOLVING THE CAPITAL ALLOCATION PROBLEM OF METROPOLITAN MASS TRANSPORTATION AGENCIES**

In order to maintain an efficient public mass transportation system in an urban area large capital expenditures are generally required. However, due to changing attitudes and priorities on the part of local, state and federal governments, funding for such public transportation systems is being curtailed. As such, it is imperative that the funding that local transportation agencies do receive be allocated for capital expenditure items in the most efficient and satisfactory manner possible. In this paper, integer goal programming is demonstrated via a case example as a means for achieving a satisfactory allocation of funds for capital expenditures (Author/TRRL)

Taylor, BW Keown, AJ (Virginia Polytechnic Institute & State University) **Transportation Research. Part A: General** Vol 17A No. 5, Sept. 1983, pp 375-383, Refs.

ACKNOWLEDGMENT TRRL (IRRF 273582)

ORDER FROM: ESL

#### 43 382798

##### **COST AND PERFORMANCE EFFECTS OF TRANSIT OPERATING SUBSIDIES IN THE UNITED STATES**

Current plans to eliminate US federal operating assistance to transit are based on the belief that subsidies lead to increases in the cost of services and losses in productivity. Surprisingly, however, there has been very little statistical analysis to date which demonstrates the effects of operating subsidies on performance, cost trends, and ridership. This paper attempts to contribute in this area by examining the historical effects of subsidies on the cost and performance trends of 17 California transit properties. Initially the competing arguments for and against operating subsidies are examined, followed by a review of what we currently know about the effects of subsidies on performance. Using a pooled time series analysis, it is then found that subsidies have indeed had a degrading effect on the performance of California transit properties over time. In particular, subsidies appear to have had a stronger influence on transit's cost spiral than its productivity declines, and the effects of local support have generally been far more onerous than federal and state subsidies. It is concluded that probably much of the blame placed on federal subsidies has been excessive, and that there is probably better ground for reducing local rather than federal aid. (Author/TRRL)

Cervero, R (California University, Berkeley) **International Journal of Transport Economics** Vol. 10 No. 3, Dec. 1983, pp 535-562, 36 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273713)

ORDER FROM: International Journal of Transport Economics, Via GA Guattani 8, 00161 Rome, Italy

#### 43 384650

##### **THE EVOLUTION OF AN URBAN INTER-GOVERNMENTAL TRANSPORTATION DECISION SYSTEM: PORTLAND'S INVESTMENT IN LIGHT RAIL TRANSIT**

This case study analyzes the experience of the Portland, Oregon metropolitan area with the interstate substitution provisions of the Federal Aid Highway Act, as amended. In deciding to build a \$311 million Light Rail Transit System, the region had to hurdle a number of political, financial, and institutional obstacles. In the process of bringing the project to the construction stage, a major intergovernmental decision system was con-



structured de novo. The consequences of this process affected not only personal mobility in the urban area but land use, economic, and political values. The lessons of this experience underscore the need to treat such decisions as more than simply a grant seeking process and demonstrate the broad implications of large scale transportation improvements in metropolitan areas.

Edner, SM (Portland State University) *Journal of Urban Affairs* Vol. 6 No. 1, 1984, pp 81-96

ORDER FROM: Virginia Polytechnic Institute & State University, Architecture and Urban Studies, Blacksburg, Virginia, 24061

**43 384896**

**USE OF UNRESTRICTED FEDERAL FUNDS IN THE U.S.  
DOT/FHWA (DEPARTMENT OF TRANSPORTATION/FEDERAL  
HIGHWAY ADMINISTRATION SECTION 18 PROGRAM.  
FINAL REPORT**

This report explores use of Federal funds with certain legal characteristics to match Section 18 transit program funds. It focuses on South Carolina's

implementation of this provision for local match using "unrestricted Federal funds," and compares it to what is being done in other Consortium States: Arkansas, Iowa, Massachusetts, Michigan, and North Carolina. The report presents two case studies in which a complete range of unrestricted Federal funds utilization can be found

See also PB82-209248.

Tudor, DN

Transportation Accounting Consortium, Department of Transportation, Department of Health and Human Services TAC-83-2, June 1983, 43p

ORDER FROM: NTIS PB84-139849

44 380156

**DIARY OF A TRAFFIC MANAGEMENT TEAM: THE HOUSTON EXPERIENCE (ABRIDGMENT)**

The traffic management team approach to solving transportation operational problems in a rapidly growing urban area-Houston, Texas-is discussed. The Houston Traffic Management Team, as it is referred to, is an interagency group that is composed of representatives from Harris County law enforcement agencies; city, state, and county transportation departments; and the Metropolitan Transit Authority. The team meets monthly to discuss such topics as the review of traffic control strategies for major urban rehabilitation projects, review and approval of proposed operational changes to existing facilities, and operational problems encountered by law enforcement officials. The most important result of the team's activities since its inaugural meeting in January 1981 is the communication links that have been established between all transportation-related agencies in Harris County. It is recommended that the traffic management team approach be applied when the successful operation of existing transportation facilities crosses jurisdictional boundaries, as in Harris County.

This paper appeared in Transportation Research Record No. 906, Urban Traffic Systems.

Levine, SZ Kabat, RJ (Texas State Department of Highways & Public Transp) **Transportation Research Record** No 906, 1983, pp 44-46, 1 Ref.

ORDER FROM: TRB Publications Off DOTL JC

44 380201

**VICTORIA'S BOLD VENTURE INTO CENTRALLY PLANNED TRANSPORT**

Last month the entire organisational structure of Victoria's land transport was swept away. A transport directorate attached to the Ministry of Transport will plan and co-ordinate four operating authorities responsible for roads as well as public transport. As happened in South Australia, VicRail's functions have been split with one authority providing urban transport including commuter trains and another taking over freight and country passengers. The objective is to provide a higher level of service, with patronage of public transport encouraged by simplified fares and better integration of train, tram and bus operations.

Crabb, S **Railway Gazette International** Vol. 139 No. 8, Aug. 1983, pp 594-595

ACKNOWLEDGMENT: British Railways

ORDER FROM: ESL

44 380207

**MERSEYRAIL: BUILDING ON SUCCESS**

Britain's Merseyside Passenger Transport Executive (MPTE) is the local agency responsible for Liverpool's public transit operations. It is unique in having an extensive electric rail system worked under MPTE subsidy by British Railways. Despite the fact that this area has one of Britain's worst unemployment levels, ridership on the suburban trains has continued to grow since the 1977 opening of cross-city loop lines. Both peak and off-peak patronage has grown with fare levels and zone tickets designed to achieve these results. Coordinated services are also offered.

Abbott, J **Modern Railways** Vol. 40 No 421, Oct. 1983, pp 524-529, 4 Fig., 9 Phot.

ORDER FROM: Allan (Ian) Limited, Terminal House, Shepperton TW17 8AS, Middlesex, England

44 380822

**FEDERAL MASS TRANSIT POLICY—1981-1982: A FALL FROM GRACE?**

The Carter Administration budgets for transit for years after the Reagan Administration came to office were swiftly redirected after the transition, particularly with the Republicans regaining control of the Senate. The Federal operating aid would be phased out by 1985 and capital assistance cut back since this was seen as a state and local responsibility. The federal role had been increasing since state and local governments chose not to tax for transit and the transit industry had failed to institutionalize transit as a vital part of the communities it served. At the federal level there had been a failure to develop a coherent transit policy. In 1981 transit fares started to rise substantially for the first time since 1974. In 1982 with ridership decreasing for the first time in a decade, the new authorization came up for

action. The series of actions on this program are described, including the increase in the federal fuel tax for benefit of highway and transit purposes. The author concludes that the new transit legislation is far better than could have been expected. He sees effective lobbying and efforts of the Secretary of Transportation in funding renewal of the decaying highway and transit infrastructure. Time has been bought for the industry. States and localities must be made to appreciate transit and the industry must make new efforts to increase revenues and control costs.

Smerk, GM (Indiana University, Bloomington) **Transportation Journal** Vol. 23 No. 1, 1983, pp 38-86, 2 Tab., 4 App.

ORDER FROM: University Microfilms International, 300 North Zeeb Road, Ann Arbor, Michigan, 48106

44 380870

**PUBLIC TRANSPORT IN LONDON**

This white paper sets out the government's proposals regarding London regional transport. It has been decided that control of the London Transport Executive should be transferred as soon as possible from the GLC to the Secretary of State for Transport. It will then be reconstituted on the pattern of a small holding company, with its bus and underground operations established as separate subsidiaries. The holding body, which will be renamed London Regional Transport (LRT), will be responsible for the strategic control of its operating subsidiaries and for securing the cost-effective provision of bus and underground services from these and other operators. LRT will have four initial tasks:-to improve bus and underground services for London,-to reduce costs and the call on taxpayers'money and generally secure better value, -to involve the private sector in the provision of services and to make better use of publicly-owned assets,-to promote better management through smaller and more efficient units, with clear goals and measurable objectives. (TRRL)

Her Majesty's Stationery Office CMND 9004, July 1983, 9p

ACKNOWLEDGMENT: TRRL (IRRD 270995)

ORDER FROM: Her Majesty's Stationery Office, 49 High Holborn, London WC1V 6HB, England

44 380892

**SERVICE LEVELS OF URBAN PUBLIC TRANSPORT VOLUME VII. OVERVIEW OF THE SYSTEMS OF STANDARDS**

The system of standards for service levels of urban public transport in the Netherlands would need to satisfy the requirements to take account of demand, of practical feasibility and of political acceptability (the latter having yet to be decided on). One criterion which a number of large authorities felt to be very important was the policy-sensitivity in respect of land-use developments (criterion 8). Criterion 3 which is concerned with minimum standards, was considered important by, in particular, the smaller local authorities. The local authorities attached varying significance to the other criteria. Comparison of the NEI systems with those of the IPA reveals that the two groups differ in their scores on a number of points but there are fairly strong links between the systems within a single group. Neither group pays explicit attention to the objectives of land-use policy, although, as explained in section 10, they are sensitive to policy on that issue. For the other volumes of this series see IRRD 271267 to 271272. (TRRL)

See also IRRD 260054, TRIS 361462.

Ministerie van Verkeer en Waterstaat Monograph 1982, 27p, Tabs.

ACKNOWLEDGMENT: TRRL (IRRD 271273), Institute for Road Safety Research SWOV

ORDER FROM: Ministerie van Verkeer en Waterstaat, P.O. Box 20901, The Hague, Netherlands

44 381043

**THE ROLE, FUNCTION AND EFFECTIVENESS OF METROPOLITAN PLANNING ORGANIZATIONS**

The main objective of this research project is to explore the effectiveness of the Metropolitan Planning Organizations (MPOs) in this country through the use of an in-depth analysis of two representative MPOs and the systematic scanning of another 16 such organizations representative of the various conditions and circumstances prevailing in the different regions of the country. In order to assess the effectiveness of the MPO agencies, the project included the role and function of these agencies. Further, the project focused on regional planning instrumentalities that have been

formally designated by the Governor of each state as MPOs, as required by Federal regulations. The MPOs that were selected for an in-depth analysis are the Delaware Valley Regional Planning Commission and the Wilmington Metropolitan Area Planning and Coordinating Council. The research approached in the analysis was based on extensive interviews, detailed review of numerous documents, and actual observation of the operations of the agencies. The findings of this research effort suggest that the MPOs are, in general, performing effectively in dispensing the strict Federal and State programmatic objectives. Most of the MPO agencies were created to meet the Federal 3C requirements and to bring to each region as much Federal funding as possible. The report points out that these objectives are being well met in most cases, but that the effectiveness of MPOs is rather limited in delivering regional planning services to the regions in a broad enough framework that encompasses developmental planning and strategic regional planning. The report concludes that a primary factor in improving the regional planning effectiveness of MPOs seems to be the increase of the appreciation of these agencies locally, an increase of the work program flexibility of the agencies themselves, and an improvement of their funding capability to undertake work well beyond the Federal and State programmatic tasks.

Tomazinis, AR Mitchell, RB  
 Pennsylvania University, Philadelphia, Urban Mass Transportation  
 Administration UMTA-PA-11-0025-83-1, Jan. 1983, n.p. Contract  
 PA-11-0025  
 ORDER FROM: NTIS PB83-256982

**44 381475**  
**THE OMEGA FILE: TRANSPORT**

As part of the Omega Project, which is designed to review areas of UK government policy for public discussion, the report investigates public transport organisation and policy. The assumption that public transport systems have to be provided by monopolistic corporations is questioned as such an assumption is stated to be unsupported by economic theory. The report suggests that the restoration of a free market in public transport, with barriers to outright subsidisation, would restore viability to the public transport industry and would ensure the replacement of any services which fail with alternatives justified by effective demand. It is emphasised that road users must be charged for the costs imposed on the infrastructure of the industry by some form of direct pricing. Until this situation is understood by the private vehicle owner, it is considered that there can be no sound foundation for the development of a free market economy for transport by the return of the industry to private ownership. Recommendations are made concerning the introduction of vehicle metering and road pricing, the deregulation and sale of the bus industry, the deregulation of the taxi trade to promote paratransit alternatives, the leasing of underground lines, and, the disposal of non-railway property and interests.

Adam Smith Institute Monograph 1983, 34p

ACKNOWLEDGMENT: TRRL (IRRD 272760)  
 ORDER FROM: Adam Smith Institute, 50 Westminster Mansions,  
 London, England

**44 381594**  
**URBAN TRANSPORTATION POLICY IN FRANCE**

The paper will present the French government policy in the field of transportation. Since most of the decision making is done at a local level, the paper will focus on the various incentives the government provides to see its policy implemented. December 1982 - a law passed that defined the broad framework of the transportation policy. It promotes for all types of transportation the concept of "right for transportation", asks for social and economical project evaluations, and for an urban transportation plan which is set by the authority in charge of public transportation. The former traffic system management was at first only aimed to improving car traffic - the urban transportation plan involves comprehensive planning. Besides the law, the government has developed a set of tools to promote its policy: (1) priority to public transportation through pay roll tax, development contract, refunding of 40% of the monthly pass for employees by their employers. (2) decrease car accidents through the "react" programme and financial incentives for the cities. (3) reduce energy consumption through mode shifts especially for short trips. (4) subsidies for by passes building and work on urban highways. A detailed presentation of those tools and their impact will be given. (Author/TRRL)

Transport Policy. Proceedings of Seminar M held at the PRTC 11th Summer Annual Meeting, University of Sussex.

Cyna, M (Centur, France) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc** 1983, pp 169-177

ACKNOWLEDGMENT: TRRL (IRRD 273081)  
 ORDER FROM: Planning and Transport Res and Computation Co  
 Ltd, 110 Strand, London WC2, England

**44 381601**  
**THE DESTABILISING EFFECT OF THE TRANSPORT ACT 1980**

Changes brought about by the Transport Act 1980 have in varying degrees created uncertainty for the bus industry and the existing patterns of bus services. This uncertainty or destabilisation has produced widely different responses both between and within the different market sectors of the bus industry. The paper will examine the nature of this destabilisation and the contribution to resulting outcomes by; (I) the response and attitudes of the traffic commissioners and county councils in regulating services; (II) the opportunities for earnings in the various market sectors either directly through revenue or through revenue support; (III) the ability and willingness of operators to compete. Comparisons will be made between market sectors of the effectiveness of the act given the different degrees of deregulation. Comments will be made as to how competition has been avoided or eliminated and whether the restabilised patterns are significantly different from before. (Author/TRRL)

Transport Policy. Proceedings of Seminar M held at the PRTC 11th Summer Annual Meeting, University of Sussex.

Holder, AR Evans, AW Hoyes, L (School for Advanced Urban Studies) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc** 1983, pp 89-98, 2 Fig., 2 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273089)  
 ORDER FROM: Planning and Transport Res and Computation Co  
 Ltd, 110 Strand, London WC2, England

**44 381683**  
**HAMPSHIRE'S APPROACH TO PUBLIC TRANSPORT**

A range of activities and interests developed in Hampshire since 1974 are described under three headings, development, co-ordination and works. Development is concerned with expected problems and opportunities, including policies and research. Co-ordination is the foundation of county involvement. The detail of service networks and their inter-relation with each other, subsidy allocation, survey direction, trials to test demand, consultations and special publicity arrangements are all involved. In 1982/83 Hampshire will spend nearly £3.2M in subsidies to bus and ferry services. In full co-operation with the operators the entire county bus and ferry network has been surveyed comprehensively over the last two and a half years at a total cost of approximately £500000 of which the county has paid 50%. Co-ordination must include internal transport arrangements especially school transport which should compliment the public transport networks. All significant passenger fleets should be administered in a fashion which maximises their utilisation within certain constraints. Unconventional transport has much to offer as conventional networks contract and while the origin of the resources matter little it is important that an overall view of transport is taken which must be a proper role for county council involvement. Publicity efforts must be sustained to achieve real benefits. Hampshire helps the operator to take initiatives improving on the current arrangements. Works to assist public transport are the most tangible expression of the county's interest and involvement. Hampshire recognises that the replacement, renewal and improvement of public transport infrastructure neglected for too long cannot be financed solely by the operators' cash flow if a civilised system is the aim. Averaging just over £250000 per annum the period since 1974 has seen three LIM projects completed. General-while progress since 1974 has been respectable there are still areas of very considerable potential. The conventional networks still remain the dominant ones and there is a feeling that not all organisations and authorities are pulling in the common direction. Much remains to be done. (TRRL)

Public Transport. Proceedings of Seminar M held at the PRTC 10th Annual Meeting, University of Warwick, England.

Gregory, WR (Hampshire County Council) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc** 1982, pp 165-178, 3 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 272847)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

44 382319

**ENTHUSIASM RIDING HIGH FOR DALLAS TRANSIT SYSTEM**

Dallas, Texas and some of its suburbs have voted to raise their sales tax by 1% to fund the largest public works project in the area's history, the Dallas Area Rapid Transit (DART) which will involve an extensive light-rail transit system. The 1983 approval followed defeat of a transit referendum in 1980, and was preceded by involvement of citizens in the transit planning process. A downtown transit mall and short subway are to be the center of a series of radial light-rail lines to be built over the next 27 years and cover a total of 117 miles. In the near term significant improvements are to be made in Dallas bus services. The political processes involved in selling this program are described.

Myerson, AR *Mass Transit* Vol. 11 No. 2, Feb. 1984, 5p, 1 Phot.

ORDER FROM: Mass Transit, 337 National Press Building, Washington, D.C., 20045

44 382582

**THE APPLICATION OF THE FEDERAL ANTITRUST LAWS TO MUNICIPAL TAXICAB REGULATION**

This report analyzes the application of Federal antitrust laws to municipal regulation of the taxicab industry. Spurred by two recent Supreme Court decisions involving the electric utility and cable television industries, municipalities have become concerned that their regulatory practices vis-a-vis the taxi industry may be in violation of Federal antitrust laws. This report first describes the two part Supreme Court test for municipalities to secure exemption from these laws and then analyzes municipal tax regulation's compliance with this test. States are generally exempt from antitrust laws. Recent court cases suggest that municipalities are exempt only under specific circumstances. Municipalities come under the umbrella of state exemption if local regulation is authorized by state law "clearly articulating" and "affirmatively expressing as state policy" the regulation in question and if municipalities undertake "active supervision" of the regulated industry. The report states that in only nine states are municipalities fully under this umbrella, while they are partially sheltered in several more. The report concludes that with regard to their exposure to charges of antitrust violations in connection with taxi regulation, municipalities can make one of three choices. They may do nothing and await clarification from the courts, they may deregulate their taxi industries, or they may persuade their state legislatures to pass laws bringing them under the protection of state exemption.

Seligman, J  
Transportation Systems Center, Urban Mass Transportation Administration, (DTS-64) Final Rpt. UMTA-MA-06-0049-84-5, DOT-TSC-UMTA-83-51, Dec. 1983, 64p, 1 App.

ORDER FROM: NTIS PB84-165786

44 382590

**CONTRACTING OUT: PUBLIC EMPLOYEES' GROUP CONTENTS THE PRACTICE HAS SERIOUS SHORTCOMINGS**

The practice of contracting municipal services is discussed from the public-employee union standpoint. It is noted that early in the century cities and towns turned to private companies to run their streetcars, collect their garbage and perform other basic public services. Gross abuses led to the reform movement of the 1920s when many such services were made part of municipal government. Under state and local financial pressures and with federal government urging, the pendulum is now swinging back to the private sector for provision of service and will until, some warn, "there is another round of abuses and scandals." While state and local government could realize short-term benefits through lowered personnel costs, the quality of services may be diminished and costs may begin to escalate after an initial decrease. It may be difficult to have contracts assure that government gets what it wants at the agreed price. Contractors can also refuse to do anything that is not in the contract. True competition for contracts may be the exception. The union position is that responsible government requires improving the quality of public management and public service, not the selling off of government.

Lampkin, L (American Fed of State, County & Municipal Employee) *American City and County* Vol 99 No. 2, Feb 1984, pp 49-50

ORDER FROM: Bittenheim Publishing Corporation, Berkshire Common, Pittsfield, Massachusetts, 01201

44 382642

**THE LONG-TERM RAIL TRAFFIC PATTERN**

Against the background of the Contract renewal between the State and SNCF, long-term studies covering demand were carried out to assess the place of railways in the overall transport context. The aim of these studies was to highlight the impact of national social and economic trends as well as of the international environment (more particularly the cost of crude oil), and to identify strategic corporate actions together with shifts of emphasis in Government transport policy. The results obtained were based on a dual approach involving recourse to classical econometric methods and the lessons drawn from marketing studies. They suggest a moderate growth of the "transportable" potential, an increase in the railborne share of passenger traffic thanks to improvements in the quality of service, and possibilities of securing a firmer foothold in the full-load market providing measures to level out the conditions of competition are gradually introduced [French]

Aurnigac, A Baudouin, *JM Revue Generale des Chemins de Fer* Vol 102 Nov 1983, pp 682-699

ACKNOWLEDGMENT: *Revue Generale des Chemins de Fer*  
ORDER FROM: ESL

44 382643

**RAILWAY PASSENGER SERVICES: A BUSINESS OR A SOCIAL RESPONSIBILITY?**

The author states it is his firm belief that in a market-based economy, where private initiative and freedom of choice are the norm, and social justice an objective, State intervention must be kept to a minimum without of course allowing things to get out of hand. The proposition, as he sees it, boils down to defining the just level of state intervention. There is of course no universal answer, even in market-economy countries where all manner of subtleties have been introduced into the concept. But there are unmistakable common trends.

Bouley, J *Rail International* Vol. 14 No 11, Nov 1983, pp 24-26

ACKNOWLEDGMENT: British Railways  
ORDER FROM: ESL

44 382787

**DEREGULATION IN THE BUS AND COACH INDUSTRY**

The 1980 Transport Act removed many of the licensing restrictions upon bus and coach operation in the UK. This paper discusses the principal events which have occurred since that date. The considerable developments in the express coaching field are recounted, with detailed evidence from the East Midlands area. The outcome has been heavily in favour of the established operators, who have enjoyed major gains in patronage. The private sector has fared badly. The high level of activity is contrasted with the lack of major change in the stage carriage (local services) field. Several factors are put forward to explain this inertia. It is concluded that to date the bus and coach industry and the travelling public have benefited from the legislation, although this must be seen in net terms. British Rail has been the principal loser (TRRL)

Kilvington, RP (Oxford University, England) *Highways and Transportation* Vol. 30 No. 12, Dec. 1983, pp 2-7, 5 Tab, 5 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273612)  
ORDER FROM: Institution of Highways and Transportation, 3 Lygon Place, Ebury Street, London SW1, England

44 382812

**PUBLIC TRANSPORT COORDINATION. RAILWAYS THE NEGLECTED MODE?**

The paper traces the role of local authorities in public transport planning from the late 1960's. Details are given of attempts to make the most effective and economic use of bus and rail services. The differing roles of metropolitan and shire county councils will be examined and especially the abilities of each type of authority to come to grips with their role in public transport coordination following local government reorganisation in 1974.

The second part of the paper examines individual cases where attempts have been made to promote local rail services and describe some of the hurdles encountered. In the light of the Serpell Report on the future finances of British Railways and the renewed pressures from the rail to road lobby is there a future for railways in the UK? Or will the network be allowed to decline and leave a few main routes radiating from London? The author outlines the conversionists case and counters this with some of the technical reasons why theirs may not be a low cost solution. Finally have we "got it right?" it would appear that the rest of Europe is preparing for a future when the oil runs out, or will at best dwindle and be highly priced. Many countries are investing in electrified urban and inter-urban rail systems. Indeed reports of rail electrification projects appear at regular intervals in the technical press, from developed and developing countries across the world. Have our local authorities failed in their role of transport coordinators to take sufficient account of the place of rail in planning for the present and medium term future and as a direct result will face considerable problems when the oil runs out? (TRRL)

Public Transport Planning and Operation. Proceedings of Seminar L held at the PTRC 11th Summer Annual Meeting.

Hamilton, TD (Durham County Council) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc** 1983, pp 183-195, 16 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273504)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**44 382817**

**PUBLIC CONTROL OF THE BRITISH BUS INDUSTRY**

The book examines the objectives and economic consequences of the road passenger transport licensing provisions of the Road Traffic Act 1960, the Transport Act 1968, and also the Local Government Act 1972. In this connection attention is also given to the formation of the National Bus Company and the Scottish Transport Group, the work of the passenger transport authorities and executives, and also the co-ordinating functions of the non-metropolitan county councils. Also considered is the question whether the present degree and nature of public control of the bus and coach industry, and the current system of licensing, is in the interests of the consumer, the industry and of the economy generally. The authors discuss

the subject in the following chapters: (1) Objectives and legal background; (2) Economic principles; (3) Origins of the 1930 Road Traffic Act; (4) Implementation of the 1980 Act; (5) Some opinions on licensing; (6) A traffic court in action; (7) Costs, revenues and cross subsidy; (8) Conclusions; (9) Summary and proposals. The research work represented by the book was supported by the Rees Jeffreys Road Fund. (TRRL)

Glaister, S (London School of Economics), Mulley, C  
Gower Publishing Company Limited Monograph 1983, 139p, Tabs., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 273212)

ORDER FROM: Gower Publishing Company Limited, Gower House, Croft Road, Aldershot, Hampshire, England

**44 384604**

**LONDON REGIONAL TRANSPORT BILL**

Following proposals described in the white paper "Public Transport in London", the bill transfers control of the London Transport Executive from the Greater London Council to the Secretary of State and also re-names it London Regional Transport (LRT). There is to be central government funding of LRT with a contribution to the exchequer from London ratepayers. The bill requires subsidies to be established for the bus and underground undertakings, and also includes powers for the involvement of private capital in these and other subsidiaries of LRT and the disposal of parts of LRT operations. Provision is made in the bill for other bus operators to operate either under agreement with LRT or independently of LRT under road service licences from the traffic commissioners. A single new consumer body is to be established for LRT and for British Railways Board services in the London area. There are reserve powers under which LRT would assume responsibility for financial support of British Railways Board services in the London region. (TRRL)

House of Commons Bill, No. 68

Her Majesty's Stationery Office Dec. 1983. 99p

ACKNOWLEDGMENT: TRRL (IRRD 274594)

ORDER FROM: Her Majesty's Stationery Office, 49 High Holborn, London WC1V 6HB, England

45 380172

**ESTIMATING THE EFFECTS OF RESIDENTIAL JOINT-DEVELOPMENT POLICIES ON RAIL TRANSIT RIDERSHIP**

A study that examines the impact of residential growth management strategies on transit ridership on a proposed rail transit corridor is presented. An interactive corridor sketch-planning model was developed to replicate various residential density patterns in the corridor and estimate transit patronage for work trips. The model also estimates patronage for transit access modes, including walk-and-ride, park-and-ride, kiss-and-ride, and feeder bus. Automobile drive-alone, carpool, and vehicle miles of travel (VMT) statistics for work trips are also reported. The model allows the planner to test combinations of policies to concentrate growth in high-rise buildings, create clusters of medium-rise housing, and restrain growth in exurban portions of the corridor. The transit ridership impacts of these policies are compared with an unmanaged growth base case. It was found that through stringent land use controls, rail transit modal split could be increased by almost 16 percent over the base case, with a reduction in overall VMT for central business district bound work trips. Other, less-stringent residential land use policies can achieve smaller, but still significant, favorable changes in transit ridership. The paper concludes with a discussion of the problems associated with implementing corridor land use management policies.

This paper appeared in Transportation Research Record No. 908, Transit Terminal Facilities and Urban Rail Planning.

Lutin, JM (Gibbs and Hill, Incorporated); Markowicz, BP (Princeton University) *Transportation Research Record* No. 908, 1983, pp 7-12, 1 Fig., 5 Tab., 2 Ref.

ORDER FROM: TRB Publications Off DOTL JC

45 380583

**THE WAY TO GO. THE BENEFITS OF QUALITY DESIGN IN TRANSPORTATION**

This publication examines a variety of cases that demonstrate the aesthetic quality of transportation projects. These range from the relatively inexpensive painted "Gus Bus" in Grand Rapids to the large-scale project of designing the Montreal Metro. The purpose is to develop a fresh perspective on ways the visual appeal of transportation can be identified as a distinct element for consideration, and on the degree to which quality design contributes to the economics and function of transportation systems. A second purpose is to develop guidance and examples to assist transportation planners and citizens in dealing with these issues. The projects presented represent a wide range of costs and circumstances encountered in transportation planning. The study shows that the aesthetic benefits provided by quality materials, sensitive design, careful maintenance, and appropriate inclusion of works of art translate directly into increased patronage, cost efficiencies, and a better public environment.

Partners for Livable Places, National Endowment for the Arts, Department of Transportation HS-035 246, Apr. 1983, 127p, Photos., Refs.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration

ORDER FROM: GPO

45 380843

**METHODS FOR ANALYSIS AND PLANNING OF LAND USE AND TRANSPORTATION SYSTEMS [METODER FOER ANALYS OCH PLANERING AV BEBYGGELSE- OCH TRANSPORTSYSTEM]**

A system of mathematical models for regional and municipal land use and transportation planning/forecasting (Translok) was gradually developed during the 70's. The system consists of normative planning models, forecasting-oriented explanatory models, and methods for evaluation of plan characteristics. Applications of the models are reported, e.g., forecasting regional economy, long-term planning of the regional structure (physical planning), location of one or more activities, and traffic forecasting. The characteristics of the system comprise interrelationships between land use and transportation systems, components and conflicts of objectives, time perspectives, and uncertainties/probabilities. Some future research tasks are formulated. (TRRL) [Swedish]

Lundqvist, L

Swedish Council for Building Research Monograph Rapport 6:1983, 1983, 169p, Figs., 12 Tab., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 270912), National Swedish Road & Traffic Research Institute

ORDER FROM: Swedish Council for Building Research, St. Goeransgatan 66, Box 27063, S-11230 Stockholm, Sweden

45 380846

**DEVELOPING FINANCIAL STRATEGY IN THE TRANSPORTATION SYSTEM**

Since the early 1970's a two part planning strategy has been evolving in the city of Calgary to manage the development of the municipal transportation system. One part involves a dynamic planning process to identify the physical characteristics of the transportation systems needed to respond to projected land use patterns. The other part is a program of operating policies and staging strategies which determine levels of service to system users and relationships between various modes of transportation. The two parts of this plan are interrelated and must also be congruent with broad city objectives outlined in the general municipal plan and with municipal financing capabilities. The subject of this paper is an overview of the development of the operational part of the plan, particularly with regard to funding and the decision making processes which have been applied to respond to various conditions experienced by the city. (Author/TRRL)

Proceedings of the 1982 Roads and Transportation Association of Canada Conference, Halifax, Nova Scotia, September 1982.

Bolger, D (City of Calgary)

Roads and Transportation Association of Canada Proceeding Sept. 1982, 15p, 5 Fig., 4 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 270872), Roads and Transportation Association of Canada

ORDER FROM: Roads and Transportation Association of Canada, 1765 St Laurent Boulevard, Ottawa, Ontario K1G 3V4, Canada

45 380857

**RETURN TO THE CITY [TERUG NAAR DE STAD]**

This paper is a study into the effects which a more compact form of urbanization in the Amsterdam region will have on traffic and transport. This urbanization policy has been proposed as an alternative to the present policy of deconcentration in a limited number of directions, which has proved unsatisfactory for the larger cities, and for Amsterdam in particular. A number of conclusions are drawn about the policy, based on analysis and the testing of hypotheses, from the point of view of traffic and transport. They concern the size of population and employment and their distribution over the Amsterdam conurbation, the role of the city centre and the qualities to be required in the traffic and transport system (Author/TRRL) [Dutch]

Liemburg, RT Roozen, A Kleijn, HJ (Dienst Ruimtelijke Ordening) Colloquium Vervoersplanologisch Spuurwerk Colloquium 1982, 1983, pp 1-36, 4 Fig., 7 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 270665), Institute for Road Safety Research SWOV

ORDER FROM: Colloquium Vervoersplanologisch Spuurwerk, P.O. Box 45, Delft, Netherlands

45 380894

**TRANSPORT AND CITY DESIGN: RECENT TRENDS IN THE DESIGN OF URBAN TRANSPORT FACILITIES**

This paper reviews the state of the art of long term structure planning, and advocates the adoption of a total design philosophy for the development of residential areas in the Republic of South Africa. The need for clearer perceptions of current relationships between land use and transport are exemplified and a reappraisal of the urban road classification is suggested, based on the need to differentiate traffic by type, destination and function. A system of design briefs is proposed for township development which will result in more involvement for public sector planners and better guidance to developers. The paper was presented at the South African Institute of Town and Regional Planners' Conference—Planning for People, Pretoria, April 1980. (TRRL)

Cameron, JWM

National Institute for Transport & Rd Res, S Af RR 310, Apr. 1980, 18p, 1 Fig., 3 Tab., 20 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272446)  
 ORDER FROM: National Institute for Transport & Rd Res, S Af,  
 P.O. Box 395, Pretoria 0001, Transvaal, South Africa

45 381432

#### THE UNDERGROUND ARMATURE

The underground armature for cities of all shapes and sizes is, first of all, the water supply and the sewage disposal systems. Underground transportation is the second most important aspect of the human armature. Other important aspects of the underground armature are electrical distribution, gas distribution, district steam, telephone and other communication systems, processed and raw material distribution, and in some cases rail and waterborne freight and passenger transportation. This paper examines the nature of the underground armature for cities and suggests that this vital armature should be used as a positive tool in shaping cities to the demands of the next energy scarce century.(a) for the covering abstract of the conference see IRRD 271697.

Subsurface Space. Environment Protection, Low Cost Storage, Energy Savings. Proceedings.

Barker, MB (American Institute Of Architects)  
 Pergamon Press Limited 1980, pp 3-6, 2 Fig., 1 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 271683), National Swedish Road & Traffic Research Institute  
 ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

45 381433

#### FUTURE GROWTH OF LARGE CITIES AS RELATED TO THE POTENTIAL OF SUBSURFACE USE

This review of tendencies in urban development and in the demand for underground construction is intended to point out the possible urban future for an expanded utilization of subsurface space. The tendencies for urban concentration and for structural complexity of functions within local areas are remarkable. The demand for setting free the land surface from disturbing and disagreeable activities in order to attain tolerable living conditions will be a strong motivation for subsurface utilization. This can facilitate improved transport and communications, improved environment by liberating the ground surface, storage and waste and the acquisition of space claimed by the development of various functions. For the covering abstract of the conference see IRRD 271697.

Subsurface Space. Environment Protection, Low cost Storage, Energy Savings. Proceedings.

Jansson, B (Sweco, Stockholm, Sweden)  
 Pergamon Press Limited 1980, pp 7-16, 7 Fig., 2 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 271684), National Swedish Road & Traffic Research Institute  
 ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

45 381434

#### UNDERGROUND TRANSPORT IN URBAN AREAS. ADVANTAGES AND FUTURE PROSPECTS

The growing demand for transportation observed in the great conglomeration calls for mass-transit railway systems running on their own right-of-way. In addition, the undeniable advantages of below-ground installation, from the standpoints of both the incorporation of the transit system in an urban environment, promote the use of the underground space. However, this requires that specific measures be taken during the design, construction and operation phases in order to reduce the construction costs, increase comfort and "humanize" still further the surroundings. In any case, underground installation on its own right-of-way is often the optimum solution for mass-transit urban systems. It is virtually the only one that can cope with the intense traffic of large cities and the transportation conditions- comfort, speed and regularity, which are increasingly demanded by city dwellers.(a) for the covering abstract of the conference see IRRD 271697.

Subsurface Space. Environment Protection, Low Cost Storage, Energy Savings. Proceedings.

Lupiac, L (Regie Autonome des Transports Parisiens)  
 Pergamon Press Limited 1980, pp 17-29, 10 Fig., 1 Tab., 6 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 271685), National Swedish Road & Traffic Research Institute  
 ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

45 381435

#### MULTIPLE USE OF CIVIL DEFENCE INSTALLATIONS. ECONOMIC, POLITICAL AND PRACTICAL ASPECTS

This paper discusses how civil defence rock shelters may be used in peacetime. In Finland rock shelters are, for example, used as parking places and the metro line in Helsinki Kamppi-Puotinharju have five stations for civil defence purposes. It is stressed that if the shelters are used as parking places the carbon monoxide must effectively be removed. For the covering abstract of the conference see IRRD 271697.

Subsurface Space. Environment Protection, Low Cost Storage, Energy Savings. Proceedings.

Oehman, G (Civil Defence Organization in Finland)  
 Pergamon Press Limited 1980, pp 39-43

ACKNOWLEDGMENT: TRRL (IRRD 271686), National Swedish Road & Traffic Research Institute  
 ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

45 381436

#### SUBSURFACE PUBLIC SPACE DESIGN ASPECTS

Starting from a brief outline for a typology of subsurface space, design characteristics, what subsurface space provides in the way of public activities, type of activities, design potentials and criteria are discussed. A number of examples ranging from the Stockholm Subway to a study of the ship Wasa in a cave are described and analysed from the point of view of integration with urban structures and interior design. The average European city developed during many centuries is not easily adapted to the demands of modern traffic. The subway which in Stockholm passes some 20 M below ground shows one way of solving the problem. An integrated terminal connecting buses, subways and commuter trains produces problems in the way of surface space. A project for a large bus terminal in direct contact with the centre of subways and trains in Stockholm has been initiated in order to consider an alternative to a scheme for building above the existing railway terminal.(a) for the covering abstract of the conference see IRRD 271697.

Subsurface Space. Environment Protection, Low Cost Storage, Energy Savings. Proceedings.

Grant, M Gyllenskoeld, AA (Bsk Consulting Company, Stockholm, Sweden); Reimers, P (SI Stockholm Transport, Sweden); Lindblom, S Pallarp, A Samuelsson, U (College of Fine Arts in Stockholm, Sweden)  
 Pergamon Press Limited 1980, pp 127-136, 10 Fig., 6 Phot

ACKNOWLEDGMENT: TRRL (IRRD 271688), National Swedish Road & Traffic Research Institute  
 ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

45 381439

#### SUBSURFACE SPACE. A MUST FOR CALCUTTA

Calcutta has not only unmanageable traffic problems, problems of storage, shopping centres and environmental pollution are also grave. In this paper, a broad plan to develop Calcutta city by using the subsurface space has been outlined as a possible solution to these problems. The metro-railway system will reduce the traffic on the surface to a certain extent. It is planned to close the metro between 11.00 pm and 5.00 am and since the underground rail system is connected with the surface rail network these six hours can be profitably utilized for freight transport. For the covering abstract of the conference see IRRD 271697.

Subsurface Space. Environment Protection, Low Cost Storage, Energy Savings. Proceedings.

Sikka, DR Basu, JM (National Projects Construction Limited)  
 Pergamon Press Limited 1980, pp 217-223, 3 Fig., 3 Phot.

ACKNOWLEDGMENT: TRRL (IRRD 271693), National Swedish Road & Traffic Research Institute  
 ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

45 381441

**URBAN SUBSURFACE USE IN DEVELOPING COUNTRIES**

Problems caused by underdimensioned support systems (transportation, water, power, telecommunications, etc) in urban areas in developing countries are outlined. Qualitative arguments in favour of the use of subsurface space to relieve congestion are discussed from social, environmental, economic and technical viewpoints. Efforts to improve the support systems will, however, not suffice to improve conditions unless land use is controlled. Subsurface space should be seen as a valuable resource to be considered in the co-ordinated, comprehensive planning of land use and support systems. (a) for the covering abstract of the conference see IRRD 271697.

Subsurface Space. Environment Protection, Low Cost Storage, Energy Savings. Proceedings

Cyon, S (Vbb, Member of Sweco, Stockholm, Sweden)  
Pergamon Press Limited 1980, pp 425-431, 4 Fig.

ACKNOWLEDGMENT: TRRL (IRRD 271695), National Swedish Road & Traffic Research Institute

ORDER FROM: Pergamon Press Limited, Headington Hill Hall, Oxford OX3 0BW, England

45 381485

**COORDINATED PLANNING OF BUILDING DEVELOPMENT AND PUBLIC TRANSPORT [SAMORDNAD PLANERING AV BEBYGGELSE OCH KOLLEKTIV TRAFIK]**

It is essential that building development and public transport are coordinated at each stage of physical planning. Generally, expansion of existing towns is preferable to establishment of new housing areas. Detached houses in the country consume twice as much energy for travelling as for electricity and heating. Energy consumption of a family in a commuter suburb is almost treble that of one in the city. Overall population density of a town is determined by relative location of its parts. Public transport network must be planned so that it covers the whole chain of movement. Terminals must be planned so that regional and local buses connect. Generally, dense development is better for public transport, although terrace houses may have higher density than blocks of flats. Detached houses are the least dense development. Bus network should be designed so that routes can be extended to serve new housing areas. Travel distance to bus stops is important for standard and for modal choice. While public transport safety is very good, many accidents occur on the way to and from stops. Buses create little environmental disturbance. Establishment of bus streets or lanes creates problems; it saves money for bus companies but investment is made by road authority. (TRRL) [Swedish]

Kollektivtrafikberedningen Monograph KTB Rapport 1983:1, 1983, 96p, Figs., 9 Tab.

ACKNOWLEDGMENT TRRL (IRRD 272533), National Swedish Road & Traffic Research Institute

ORDER FROM: Kollektivtrafikberedningen, P.O. Box 1339, Solna, Sweden

45 382238

**COMMERCIAL DEVELOPMENT TRENDS 1972-1982. ANALYSIS OF NONRESIDENTIAL CONSTRUCTION ACTIVITY IN THE WASHINGTON REGION BEFORE AND AFTER METRORAIL**

This report summarizes the analysis of nonresidential construction activity in the Washington region before and after the opening of the Metrorail System. This report provides information from over 28,000 nonresidential permits authorized during the 1972-1982 period and data collected on 3,000 projects started during 1979-1982. This report examines the trends over the 11-year period and the characteristics of nonresidential construction inside and outside Metrorail station areas.

Caldwell, D  
Metropolitan Washington Council of Governments Dec. 1983, 63p, 18 Fig., 21 Tab.

ORDER FROM: Metropolitan Washington Council of Governments, 1875 Eye Street, NW, Suite 200, Washington, D.C., 20006

45 382564

**REVENUE FORECASTS FOR INNOVATIVE LIGHT RAIL FINANCING OPTIONS. DENVER CASE STUDY**

This report advises the Denver Regional Transportation District (RTD) on the magnitude of revenues that potentially may be generated by value capture techniques along its proposed 77-mile light rail transit (LRT) systems. The techniques include (1) lease or sale of undeveloped air and ground rights, (2) lease or sale of developed air and ground rights, (3) lease of concession space, (4) special benefit assessments, (5) tax increment financing, and (6) turnkey ventures. A range of estimates of total dollars that can be generated by application of the value capture techniques to the entire LRT system is presented. Estimates are based on a station-by-station review of the economic, legal and political feasibility of implementing each technique between 1983 and 2010. The revenue potential of value capture in Denver depends principally on two factors—Condition of the real estate market, and availability of legal authorization to implement the techniques. A range from less than 1% to over 16% of the LRT system cost of \$2 billion may be paid with dollar capture revenues. Increment financing was found to be the most financially productive of all mechanisms applied to station site development. The methodology is applicable to their transit systems.

Rice Center, Urban Mass Transportation Administration, Office of the Secretary of Transportation Final Rpt. DOT-I-83-36, Sept. 1983, 104p, Figs., Tabs., 3 App.

ORDER FROM: OST

45 382565

**AN INTERIM REVIEW ON NINE UMTA-ASSISTED JOINT DEVELOPMENT PROJECTS**

This report deals with joint development, analyzing the relative success of nine such projects begun under the former UMTA Urban Initiatives Program funding assistance. Because none of the projects in Baltimore, Boston, Buffalo, Cambridge, Cedar Rapids, Davenport, Miami, Philadelphia and Santa Ana has yet been completed, the benefits reported are those expected to accrue to the transit operating agencies and thus to the UMTA assistance program. Benefits include induced net additional transit ridership and revenues, and proceeds from the sale or lease of joint development property. Ridership and revenues are expected to be sufficient to repay UMTA's \$49.5 million investment in less than six years. The UMTA cost of \$1,000 to \$2,000 per net daily additional transit trip, one of the cost-effectiveness indicators used in alternatives analysis, is significantly lower than for most other UMTA Section 3 capital assistance investments. The UMTA funding leveraged another \$100 million in public investment and over \$700 million in private investment. The projects will generate over 30,000 new permanent jobs and yield almost \$17 million in property taxes yearly. Large projects seem most successful.

Keefer (Louis E) Associates, Urban Mass Transportation Administration, Office of the Secretary of Transportation DOT-I-83-46, Oct. 1983, 53p, Tabs., 21 Ref., 1 App.

ORDER FROM: OST

45 382597

**THE DOCKLANDS LIGHT RAPID TRANSIT SCHEME**

As part of London docklands Development Corp. urban renewal of 8 sq mi of Thames waterfront areas of east London, a light rail transit system will be built. The 8 miles of routes that will be built in the L77-million first phase are to open in 1987, utilizing active and abandoned railroad rights-of-way and new alignments in certain areas. There will be inter-changes with both London Transport and British Railways services. The light rail vehicles will be capable of train operation in peak periods. Ultimately capacity of 8,000 riders per hour will be provided; a third branch from the authorized Y-shaped system may also be built.

Glover, J *Modern Railways* Vol. 41 No 424, Jan. 1984, pp 33-36, 8 Phot.

ORDER FROM: Allan (Ian) Limited, Terminal House, Shepperton TW17 8AS, Middlesex, England



45 382749

**PUBLIC TRANSPORT AND THE TRAVEL NEEDS OF THE URBAN POOR IN DELHI, INDIA**

The paper has a general introduction on urban poor communities in the Third World and Delhi in particular with reference to the relocation of squatters to areas on the outskirts of the city. Social and economic characteristics of the six residential areas (plus present day squatters) are briefly described and comparisons made where applicable. Public transport provision differences is also discussed in this section. Trip rates, travel patterns and characteristics of employment and education trips are discussed in later sections. In a discussion section the effects of income and residence location on trip rates and travel patterns are highlighted and the possible effects of relocation to a more central area rather than distant (eg Nand Nagri) noted in terms of modal choice, travel times and distance travelled. In this way the effects of relocation can be demonstrated to both land use and transport planners and the possible management of travel demand (by the latter) more easily planned for. (Author/TRRL)

Developing Countries. Proceedings of Seminar G held at the PTRC Summer Annual Meeting, University of Warwick, England, 4-7 July 1983.

Maunder, DAC Jacobs, GD (Transport and Road Research Laboratory) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc** Volume P237, 1983, pp 139-161, 10 Fig., 9 Tab., 5 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273956)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

45 382779

**CARP: COMPUTER AIDED REGIONAL PLANNING**

Computer graphics often lies at the heart of computer aided design systems. The ease in which large amounts of information can be visualized using graphical display techniques makes computer graphics a powerful tool in a whole range of design activities. An application of interactive computer graphic techniques in the area of regional planning is presented. The spatial and temporal nature of regional planning results in large data bases which, to be effectively used, must be easily constructed, accessed and interpreted by regional planners. Traditionally, manual graphical display techniques have been used and as such are expensive and often lead to only a few planning options being fully presented. (Author/TRRL)

First Australasian Conference on Computer Graphics, Sydney, 31 August-2 September 1983. Preprints of Papers.

Roy, GG (Western Australia University, Australia); Snickars, F (Ministry of Industry, Sweden) **Institution of Engineers, Australia Preprint No. 83/10, Sept. 1983, pp 1-6, 6 Fig., 3 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 266633), Australian Road Research Board

ORDER FROM: Institution of Engineers, Australia, 11 National Circuit, Barton, A.C.T. 2600, Australia

45 382796

**RESIDENTIAL LOCATION MARKETS AND URBAN TRANSPORTATION. ECONOMIC THEORY, ECONOMETRICS AND POLICY ANALYSIS WITH DISCRETE CHOICE MODELS**

As part of a discussion on urban economics, Part 1 of the book reviews the development of economic equilibrium theory concerning the housing market and incorporating stochastic utility maximization models of discrete choice. In Part 2, chapters discuss empirical estimation, policy application and extensions of an urban simulation model developed in Part 1. Census data from the Chicago standard metropolitan statistical area (SMSA) is used to estimate the demand-and supply-side models which represent households choosing a residential location and mode of travel for

the journey to work. This formulation of demand integrates the methodology of travel demand measurement with the comparable measurement of residential location demand. The models are combined into an equilibrium simulation model which determines travel and residential choices, and is intended for the examination of business district transportation investment and policies (TRRL)

Anas, A (Northwestern University, Evanston) **Academic Press Incorporated, Limited Monograph 1982, 263p, Figs., Tabs., Refs.**

ACKNOWLEDGMENT: TRRL (IRRD 273724)

ORDER FROM: Academic Press Incorporated, Limited, 24-28 Oval Road, London NW1 7DX, England

45 382797

**SPATIAL DYNAMICS AND URBAN TRANSPORT**

In conventional transport research the starting point for network design is an exogenously determined future spatial structure of the area under consideration. Workplaces, housing, shopping facilities, etc., are all introduced as basic data. Two objections can be raised to such an approach. First, the development of the spatial structure of an (urban) area is not independent of the way the transportation infrastructure is designed; there is an obvious interaction. Second, urban areas tend to show an internal dynamic development according to a rather fixed pattern affecting the location and relocation of households, firms, and facilities. The present paper sets out to show that in any analysis of the interrelation among the spatial structure of urban areas, their transport infrastructure, and the pattern of daily movements, these two points should be taken into account (Author/TRRL)

**International Journal of Transport Economics** Vol. 10 No. 3, Dec. 1983, pp 577-592, 9 Fig., 1 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273714)

ORDER FROM: International Journal of Transport Economics, Via GA Guattani 8, 00161 Rome, Italy

45 382810

**TRANSIT LINES ON ELEVATED GUIDEWAYS**

In the 1950's and 60's a major highway network was developed in Canada such as highways 400 and 401 in Ontario moving the old roads away from populated areas. These highways had to be linked with city centres and expressways were built or at least were being planned. By the 1970's, congestion in city centres led to large tracts of land being turned into large parking lots. The attention of transportation and urban planners gradually turned from expressways to public transit. Elevated guideways serve the purpose of providing independent right-of-ways, without interrupting the unity of neighbourhoods and existing traffic flow. Guideways are gradually becoming part of the city-scape and offer plenty of scope for innovative design. If designed with care, they can blend into the surrounding environment. (TRRL)

Proceedings of the 1982 Roads and Transportation Association of Canada Conference, Halifax, Nova Scotia

Farago, B (Wyllie & Ufnal Limited); Buxton, LG (Toronto Transit Commission); Marzouk, O (Wyllie & Ufnal Limited) **Roads and Transportation Association of Canada Proceeding Sept 1982, 32p, 12 Fig., 4 Ref.**

ACKNOWLEDGMENT: TRRL (IRRD 273449), Roads and Transportation Association of Canada

ORDER FROM: Roads and Transportation Association of Canada, 1765 St Laurent Boulevard, Ottawa, Ontario K1G 3V4, Canada

46 380147

**MANHATTAN "VALLEY" CIRCULATION STUDY (WORTH STREET TO 30TH STREET)**

The study area, the low-rise segment of Manhattan linking New York City's two major high-rise concentrations of employment and development known as Lower and Midtown Manhattan, is itself a patchwork of several distinct communities and local business districts. While Manhattan Valley is predominately industrial in character with sizable residential populations along its fringes, loft conversions to residential use are common and will probably accelerate with a decline in manufacturing/industrial usage. The dynamic character of the area and its evolving transportation needs were studied. A 3-step process is described: (1) Proposed broad transportation and environmental goals, (2) definition of objectives relating specifically to neighborhoods and business districts; and (3) outlining of transportation strategies to satisfy Steps 1 and 2. While the district is served by several subway routes, the primary goal of study has been improved surface movement. Transportation System Management (TSM) strategies are detailed, including improved bus movements, through and local truck routes, auto-restricted zones, and other options.

Edwards and Kelcey, Urbitrans Associates, Incorporated, New York City Department of Transportation UMTA-NY-09-0054, TS D-682, Apr. 1983, 31p, 5 Fig Grant NY-09-0054/64

ORDER FROM: Edwards and Kelcey, 53 Park Place, New York, New York, 10007

46 380151

**APPLYING TRANSPORTATION SYSTEM MANAGEMENT TECHNIQUES TO DOWNTOWN WASHINGTON, D. C.**

For a period of 18 months, the District of Columbia Department of Transportation has actively involved in developing the transportation element of the Master Plan for Downtown Washington. The transportation element relies heavily on the transportation system management (TSM) philosophy and includes transit enhancement, ridesharing incentives, and pedestrian improvements that work together to create a better-functioning environment for all modes and for all activities vital to a successful downtown. In addition, it complements and is dependent on transportation actions occurring in other sections of the District. These include the growing Metrorail system, the parking enforcement program, and the neighborhood TSM program. An analysis was conducted to determine the transportation impacts of the proposed land use changes for the year 2000. This included an assessment of the Metrorail and road system capacities, parking levels needed to ensure mode-split objectives, and an identification of and a plan to reduce conflicts between pedestrians, automobiles, transit services, and delivery vehicles. This effort has produced a plan that is currently being implemented. Elements of the plan include a street classification system, pedestrian enhancements, streetscape design guidelines, sidewalk cafe legislation, public transit and ridesharing enhancement and promotion, a parking management program, and regulations covering the movement of goods.

This paper appeared in Transportation Research Record No. 906, Urban Traffic Systems.

Simkowitz, HJ Southern, V (District of Columbia Department of Transportation) **Transportation Research Record** No. 906, 1983, pp 1-10, 5 Fig., 3 Tab., 2 Ref

ORDER FROM: TRB Publications Off DOTL JC

46 380152

**MAKING PROGRESS WITH TRAFFIC RESTRAINT: THE ROLE OF RESEARCH**

The range of measures proposed for restraining peak-period car traffic in urban areas is reviewed, and it is demonstrated that very few of them have been successfully implemented. Based on reported decisions and discussions with decisionmakers, the reasons for rejection of these proposals are identified and the strength of the criticisms made is assessed. Although the need for restraint is still not clearly demonstrated, it is concluded that traffic restraints can probably be justified as a means of improving efficiency and the environment and that fiscal measures are the most appropriate for further development. A number of issues are identified on which further research could usefully concentrate to ensure that future proposals can be more adequately formulated, and several new research developments in the United Kingdom that will contribute to this are mentioned.

This paper appeared in Transportation Research Record No. 906, Urban Traffic Systems.

May, AD (Leeds University, England) **Transportation Research Record** No. 906, 1983, pp 10-17, 1 Tab., 60 Ref.

ORDER FROM: TRB Publications Off DOTL JC

46 380165

**ANALYSIS OF PARKING MANAGEMENT STRATEGIES FOR THE BOSTON REGION**

This report presents an analysis of six parking management strategies that have potential applications in the Boston region. They are: Implementation of Parking Freezes in Selected Areas; Alteration of the Parking Pricing Structure in the Boston CBD and Fringe Parking Areas; Preferential Parking for High-Occupancy Vehicles, Residential Parking Permit Program, Construction of Additional Fringe Parking Facilities; Improvement of Parking Enforcement Measures. Highest priority was assigned to added fringe parking for park-and-ride and park-and-pool commuter trips. Lowest priority was assigned to the parking freeze and to preferential parking for high-occupancy vehicles. Expansion of this report into a regional parking management plan would require more detailed information on local parking and traffic conditions, as well as direct input from the region's communities. The study focuses in part on air quality impacts associated with each parking strategy. Also addressed are effects of the strategies on traffic conditions and the relationship between parking supply and demand. Community issues and concerns are also discussed.

Laube, M Dansker, B

Central Transportation Planning Staff Tech Rpt CTPS 38, Apr 1983, 64p, 2 Fig., Tabs., 3 App.

ORDER FROM: Central Transportation Planning Staff, 27 School Street, Boston, Massachusetts, 02108

46 380170

**THE COORDINATION OF PARKING WITH PUBLIC TRANSPORTATION AND RIDESHARING**

Parking policies are often not coordinated with public transit and ridesharing, even though traffic congestion in urban areas and large employment centers is a major challenge for local governments in most cities. Few attempts have been made to evaluate the effectiveness of parking strategies and the relation between parking control and transportation policies such as improved transit service, staggered work hours, or priority lanes for high-occupancy vehicles. This publication examines parking policies that act as incentive for high occupancy vehicle travel, especially for commuter work trips. The following are covered: Parking incentives to increase ridesharing, parking incentives to increase the use of public transit, alternative transportation assistance programs; and bicycle parking. A listing of Federal, state and local contacts, and brief descriptions of parking programs that may be applicable to other urban areas are also provided.

Public Technology, Incorporated, Office of the Secretary of Transportation DOT-I-82-29, June 1982, 27p, 1 Fig., 5 Tab

ORDER FROM: Public Technology, Incorporated, 1301 Pennsylvania Avenue, NW, Washington, D.C., 20004

46 380261

**PARKING POLICY AND DOWNTOWN ECONOMIC DEVELOPMENT**

This paper examines the use and impact of parking management strategies in fostering downtown economic development. The impact on economic development of four kinds of parking strategies—those that control the aggregate level of parking supply, the access to parking, the spatial distribution of parking supply, and the price—are described in detail.

Meyer, MD (Massachusetts Institute of Technology). McShane, M **Journal of Urban Planning and Development** Vol. 109 No. 1, May 1983, pp 27-43, 20 Ref

ACKNOWLEDGMENT: EI

ORDER FROM: ESL

46 381614

**TRAFFIC RESTRAINT BY PRICING: EXPERIENCE FROM THE ITCHEN BRIDGE, SOUTHAMPTON**

Southampton's Itchen Bridge was opened in June, 1977. One of three toll-setting criteria contained in the Southampton corporation act (1973) explicitly permits toll levels to be set to control the volume and composition

of traffic flow over the bridge for the purposes of avoiding congestion and limiting adverse environmental impact in areas adjacent to the bridge. This represents the first deliberate introduction of traffic restraint by price in the United Kingdom. This paper explains the background and context for the construction of the bridge, the initial setting of the toll levels and the two subsequent changes. Within the limitations of available data the restraining influence of toll price on both flow and composition of traffic are examined. The toll level for heavy commercial vehicles was clearly designed to be intimidatory and has succeeded in its aim. H.c.v. Flow as a percentage of total flow using the bridge is tiny. Almost all h.c.v.'s crossing the bridge are locally generated, paying a special concessionary rate only available to local businesses. Traffic restraint has played a minor role in establishing the toll levels for other vehicles, thus firm conclusions on control of total vehicle flow are less easy to draw. Evidence from toll price changes, however, indicates an ability to coarsely control flow levels. It is concluded that Southampton's example demonstrates that toll pricing is an effective and flexible tool for control of vehicle flow and composition. The experience gained has relevance for specific strategies of traffic limitation as well as area-wide road pricing. (Author/TRRL)

Proceedings of Seminar P held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Atkins, ST (Southampton University, England) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982**, pp 105-117, 6 Fig., 9 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272890)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 46 381644

##### A MODEL OF THE COMBINED PARKING LOCATION MODE SPLIT/JOURNEY TIME DECISION

Parking policy is increasingly recognised as a central element in transport planning and management and a variety of models have been proposed for its analysis ranging from strategic demand models associated with conventional transportation studies, to stochastic models appropriate to supply management. It is suggested that, despite recent advances in the design of parking models, further consideration must be given to two central issues; namely the treatment of traveller response to parking policy; and the interaction between supply and demand. This paper discusses the context of parking model development, the structure of traditional models, and proposes a new model currently under development at ITS which draws on and extends recent theoretical developments. During development the model structure will be tested and adapted so as eventually to provide a sensible compromise between sophistication and policy sensitivity on the one hand and practicality of implementation on the other. In its most sophisticated form the model will use time-slice simulation and assignment to equilibrate demand and supply and will use nested choice models to represent the simultaneous resolution of the parking location, mode and journey timing decision. (Author/TRRL)

Transportation Analysis and Models Proceedings of Seminar Q held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Bonsall, PW Gunn, HF Williams, HC (Leeds University, England) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982**, pp 343-351, 1 Fig., 16 Ref

ACKNOWLEDGMENT: TRRL (IRRD 272794)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 46 381666

##### "THE WINKELERF". IMPROVING ENVIRONMENT FOR PEDESTRIANS IN SHOPPING STREETS, WITHOUT BANNING ALL CARS

Many Dutch cities suffered from an overdose of (through) traffic in their shopping-streets. Especially since the sixties a great number of cities therefore created pedestrian-streets in their main shopping-areas. At first the pedestrianization often met with strong opposition from retailers in the area involved. After some time however, most pedestrianized areas proved to be (economically) successful, so this last decade pedestrianization is mostly approved by retailers, even if the situation is not ideal for implementing a pedestrian-street. The success of pedestrianization depends very much upon the "character" of the street. Generally speaking one can say that food stores do not fit in a pedestrian-street, and non-food stores do.

When a shopping-street is really used for "shopping" the environmental quality is very important, and accessibility is relatively less important. In that case pedestrianization may be considered. When on the other hand visiting shops in a shopping-street has a character of doing (daily) purchases, accessibility is much more important than environment. In reality many traditional shopping-streets show a mixture of "shopping" and "purchasing". In these cases pedestrianization would go too far, and leaving it a traffic-street flanked with shops not far enough. In these cases some Dutch cities have implemented a "winkelert". A "winkelert" is a way of improving the pedestrian quality of a shopping-street, without banning all traffic completely. This is achieved by an environmental design that makes it obvious that priority lies with the pedestrian, and that car and bicycles are permitted in the street as "guests". In many ways the "winkelert" idea is analogous to the "woonerf" concept, but there are also very essential differences. The paper deals with the characteristics of the "winkelert", conditions that should be met when implementing a "winkelert" and the problems that may arise. An important point are the criteria that influence the choice if, and how much traffic should be banned (how strong are the characteristics of "shopping" and "purchasing", and how to measure them). The variety and the flexibility of the "winkelert" designs will be discussed. (Author/TRRL)

Pedestrians and Traffic. Proceedings of Seminar L held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Stenstra, S **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982**, pp 231-234, 2 Ref.

ACKNOWLEDGMENT TRRL (IRRD 272817)

ORDER FROM Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 46 381686

##### ANALYSIS OF SHORT-RANGE TRANSPORTATION POLICIES FOR THE PARIS REGION

The RATP, the Paris regional transit authority, has been conducting a study with the aim of proposing a short term policy program for improving the efficiency of the transportation system in the Ile-de-France region. One of the transportation problems of the area is traffic congestion which, among other things, is very detrimental to bus operations. A small increase in the use of public transport and decrease in the use of private vehicles would potentially result in improved functioning of the system and savings in time, energy and public expenditure. In the study, a set of individual measures to reduce automobile use (parking restrictions, traffic restraint, etc) and increase the use of transit (traffic control with priority to buses, extension of express bus network, etc) were analysed. After analysis of the individual measures, appropriate packages of measures in which the disadvantages of one measure to some groups of travellers are compensated for by advantages obtained from other measures, applied at the same time, were defined and analysed. In this way, recommendations on packages of measures could be made. The analysis methodology used disaggregate level-of-service models for the supply side (TRRL)

Transportation Planning Practice. Proceedings of Seminar N held at the PTRC 10th Summer Annual Meeting, University of Warwick, England

Arnaud, P (Regie Autonome des Transports Parisiens); Manheim, ML (Cambridge Systematics, Incorporated); Moisi, F Raison, M (Regie Autonome des Transports Parisiens) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc 1982**, pp 1-18, 7 Fig., Refs

ACKNOWLEDGMENT: TRRL (IRRD 272862)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 46 381696

##### SOCIETY HILL/QUEEN VILLAGE TRANSPORTATION MANAGEMENT STUDY. FINAL REPORT AND RECOMMENDATIONS

Because of its location on the southeast corner of the Center City and the attractiveness of its residential and commercial areas, this area is facing a number of transportation problems. The major objectives of this study are to give priority to residents and short-term customers/visitors for scarce curbside parking spaces; to reduce the parking and traffic conflicts between residential and commercial areas; to favor local traffic over through traffic; and to improve the pedestrian environment for both visitors and residents. Recommendations include some immediate and low-cost actions and

higher-cost physical improvements for a longer term. Certain changes are recommended for the bus services through the area. The report has four parts: (1) An overview of existing conditions in the study area; (2) The process by which a wide range of transportation management strategies were developed and evaluated; (3) The study team's final recommendations; (4) Issues which must be addressed if the recommended strategies are to be implemented.

Prepared in cooperation with Portfolio Associates, Kopple, Sheward and Day, Vista Systems, Wagner-McGee, Inc; and Dr. Vukan Vuchic.

Cambridge Systematics, Incorporated, Philadelphia Department of Public Property UMTA-PA-09-0067, Aug. 1983, v.p., Figs., Tabs., 5 App.

ORDER FROM: Cambridge Systematics, Incorporated, 238 Main Street, Cambridge, Massachusetts, 02142

#### 46 382300 IMPLEMENTATION OF A PEAK-PERIOD PRICING STRATEGY FOR CBD PARKING

The Madison Parking Pricing Demonstration has provided a useful data base for evaluating the impacts attributable to pricing the use of parking spaces during the peak commuting hours. Restricting the prime-time charge to those peak users who park for 3 or more hours was found to be an effective way of targeting the surcharge to long-term parkers making work or school trips. Shopping and personal business trips were not adversely affected. The \$1 prime time charge saw most auto commutation continuing, but switching to nonsurcharge parking facilities. There was some carpooling, but not primarily because of the surcharge. There was some increase in the perception that more downtown spaces were available for shopping and mid-day business parkers.

Parody, TE *Transportation Quarterly* Vol. 38 No. 1, Jan. 1984, pp 153-169

ORDER FROM: Eno Foundation for Transportation, Incorporated, P.O. Box 55, Saugatuck Station, Westport, Connecticut, 06880

#### 46 382315 LAND USE REGULATIONS TO PROMOTE RIDESHARING: AN EVALUATION OF THE SEATTLE APPROACH

Seattle, Washington, encouraged ridesharing through building-permit requirements for new commercial buildings, an authority derived from Washington State environmental legislation. The goal was to reduce parking supply for single-occupancy vehicles and insure that a project met its parking demand on site. Preliminary evaluation indicates that although long-term parking at sites has been curtailed, there has not been a corresponding increase in carpool parking. The reasons are examined. It is recommended that such controls be incorporated into zoning codes, rather than as part of environmental legislation. Other steps to insure greater ridesharing are also described.

McCutcheon, M (Seattle Department of Construction & Land Use); Hamm, J (Seattle/King County Commuter Pool) *Transportation Quarterly* Vol. 37 No. 4, Oct. 1983, pp 479-491, 1 Tab.

ORDER FROM: Eno Foundation for Transportation, Incorporated, P.O. Box 55, Saugatuck Station, Westport, Connecticut, 06880

#### 46 382316 DOWNTOWN PARKING POLICY ANALYSIS

Cities have a substantial investment in downtown parking facilities which should be managed carefully since parking is a limited resource intended to meet diverse needs. This article outlines a framework for recognizing parking policy alternatives and evaluating their effectiveness or desirability for solving parking problems. Interest Group and Achievement Matrices are recommended in this article because they are beneficial to the policy analyst. Three broad strategies can be followed: Reduce parking demand; increase parking supply; or improve parking management. Evaluation is the process of organizing, examining and judging the consequences of the alternative policies. Trade-offs can be made explicit by comparing alternatives in terms of their advantages and disadvantages. Traditional cost-benefit analysis (where the common unit of measure for all impacts is dollars and a discount rate is selected) is generally not appropriate for downtown parking policy analysis.

Kuner, R (New Alternatives, Incorporated) *Transportation Quarterly* Vol. 37 No. 4, Oct. 1983, pp 559-566, 1 Tab

ORDER FROM: Eno Foundation for Transportation, Incorporated, P.O. Box 55, Saugatuck Station, Westport, Connecticut, 06880

#### 46 382685 "RIDE AND WALK". IMPROVEMENT OF PEDESTRIAN FACILITIES FOR COMMUTERS IN CENTRAL LONDON

Walking is a major form of travel in central London. This paper describes the wide range of studies and projects that have been undertaken in the past decade to improve pedestrian movement in the heart of the capital. The relationship between pedestrian movement patterns and land use is discussed, with reference to specific travel surveys, including those for the shell centre. Special reference is made to a new GLC study which proposes that a network of pedestrian routes should link together transport interchanges, work places and pedestrian enclaves. Results of London based research into walking speeds, distances and detour factors is reviewed. (Author/TRRL)

Traffic Operation and Management. Proceedings of Seminar K held at the PTRC Summer Annual Meeting University of Sussex, England, 4-17 July 1983.

Parker, J (Greater London Council) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* Volume P240, 1983, pp 1-15, 3 Fig., 1 Tab., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 273511)  
ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

#### 46 382790 NEW PARKING SPECIFICATIONS FOR HELSINKI [HELSINKI UUSII PYSAEKOEINTINORMINSA]

The authors present the new specifications governing the calculation of car parking spaces in the city of Helsinki, according to zone classifications (town centre, town periphery, suburbs). The specifications are based on the free use of cars in the suburbs where parking needs are fully met. In the town centre long term parking is restricted and residential parking excluded. Short time parking needs are satisfied, although parking charges are applied. (Author/TRRL) [Finnish]

Suhonen, P Hoelttae, T Tie ja Liikenne No 9, 1983, pp 375-378, 2 Fig., 1 Tab., 1 Phot

ACKNOWLEDGMENT TRRL (IRRD 273939)  
ORDER FROM: Finnish Road Association, Vironkatu 6, 00170 Helsinki 17, Finland

#### 46 384596 TRAVEL TIME MONITORING IN URBAN AREAS

The reduction of urban congestion and associated delay and travel time variability is one of the most important transport policy objectives, yet very few authorities regularly monitor travel times, and those which do often use methods which are statistically suspect. The main barriers to development of monitoring methods are lack of understanding of the statistical requirements of such surveys and concern over the labour costs of current techniques. This paper describes and presents initial results from a study which attempts to overcome these barriers; its twin objectives are the development of a cost-effective data collection strategy and an investigation of the nature and causes of travel time variations. After an introductory section in which the background to the study is described, the second section reviews the uses to which travel time data can be put and the survey requirements to which these give rise. The third section describes the factors which might give rise to variability in travel time, and examines the ways in which these can be measured and their effects isolated. The range of available data collection methods are described in section 4, along with the statistical, organisational and cost implications of each method. Section 5 describes how the survey strategy was designed taking account of the issues reviewed in sections 2, 3 and 4. The final section presents some of the results obtained thus far, and observations for discussion (Author/TRRL)

Transport Planning Methods. Proceedings of Seminar N held at the PTRC Summer Annual Meeting, University of Sussex.

May, AD Montgomery, FO (Leeds University, England) **Planning & Transport Res & Comp, Sum Ann Mtg, Proc** 1983, pp 129-140, 3 Tab., 5 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273144)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

**46 384608**

#### TRANSPORTATION PLANNING FOR DELHI

The author describes the proposed road improvement scheme for Delhi based on the results and predictions of the studies carried out between 1969 and 1972. Unlike other Indian cities, Delhi has a relatively small railway network and buses are virtually the only available mode for mass transport. Problems are caused by very low density areas surrounding the centre not being conducive for public transport and forcing cyclists to travel large distances. Because of the cost and unreliability of buses, many trips are by cycle and a ring road was proposed to cater for 7000 passenger car units (pcu) and 8000 cycles per hour. Four intersections were expected to carry 14000 pcu per hour. Decongestion in the central area of the city has been helped by the building of three transport terminals at the periphery of the city and using light motor vehicles to deliver goods. The ring and radial system of roads proposed has resulted in a 40 per cent increase in bus services with only a small fleet addition. The plan also suggests the building of a circular railway line to supplement the ring road and a 58 km long metro to be built in two phases. (TRRL)

Srinivasan, NS (National Transp Plann & Res Centre Trivandrum) **Indian Highways** Vol. 10 No. 12, Dec. 1982, pp 42-50, 2 Fig., 4 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 274907)

ORDER FROM: ESL

**46 384912**

#### PARKING MANAGEMENT

The impacts of a major parking management program for the Baltimore area are examined. Existing policies in the metropolitan area are primarily to provide sufficient auto storage facilities, improve traffic flow and enhance

the economic viability of commercial areas. With the aim of improving air quality, Transportation System Management (TSM) measures can include parking management in the central business district and at suburban activity centers. Options include elimination of free parking or removal of parking spaces to reduce single-occupancy work-related automobile travel, but there must be available viable alternatives such as transit service and/or vanpool programs. Assessments for this study indicate that more vigorous application of parking management strategies in the Baltimore area could eliminate 12,000 daily peak-period auto work trips in 1987, along with a daily 150,000 vehicle-miles-of-travel. Pilot studies are recommended together empirical data about impacts of various parking management strategies and identify any unforeseen barriers to their implementation.

Regional Planning Council ROC 83-18, July 1982, 73p, 30 Tab.

ORDER FROM: Regional Planning Council, 2225 North Charles Street, Baltimore, Maryland, 21218

**46 385292**

#### TRAVEL RESTRAINTS IN CITY CENTERS: THE AMERICAN EXPERIENCE

The concept of travel restraints that inhibit or restrict car use in city centers has become increasingly popular in Europe and Asia as a means of alleviating problems of air pollution, energy consumption, traffic congestion and lack of parking space. The types of traffic restraints that have worked in American city centers are far less restrictive both in severity of restriction and area of application. This article reviews the American experience. It identifies the types of restraint that have been considered and tried; where they have worked and why; and the factors that contribute to, or underly, a successful scheme

Levinson, HS (Connecticut University, Storrs) **Transportation Quarterly** Vol. 37 No. 2, HS-035 807, Apr. 1983, pp 277-288, 2 Fig., 4 Tab.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration

ORDER FROM: Eno Foundation for Transportation, Incorporated, P.O. Box 55, Saugatuck Station, Westport, Connecticut, 06880

47 381459

**A FRAMEWORK FOR URBAN FREIGHT POLICY ANALYSIS**

An overview is provided of the urban freight process, in the context of the supply and demand aspects of freight. A framework for analysis is developed, and within that framework, particular aspects of the urban freight process are described. Issues of concern from a public policy viewpoint are highlighted. Seven main instruments related to public policy are introduced and their application described—taxes and subsidies, regulations, investment, operational instruments, planning, public ownership and research. It is concluded that the importance of urban freight to the community and its relevance to urban transport justifies a higher level of attention in transport planning and policy formulation, and that there are a wide range of policy instruments available to enable this to be done. The objective of such planning and policy making needs to be specified in each specific context (a). The paper was prepared for presentation to the New Zealand roading symposium, August 1983. (TRRL)

This report was also published in *Transportation Planning and Technology*, Vol. 8, No. 4, 1984, p. 253-265

Ogden, KW

Monash University, Australia, (0156-2126) Monograph Civil Eng Pap 83/1, Mar. 1983, 10p, 1 Fig., 29 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 266517), Australian Road Research Board

ORDER FROM: Monash University, Australia, Department of Civil Engineering, Wellington Road, Clayton, Victoria 3168, Australia

47 381460

**A MODEL OF MANAGERS PREFERENCES FOR LOCATION OF FREIGHT FACILITIES**

The need for a better understanding of the factors which affect the location of freight facilities, such as depots, terminals, freight forwarding centres, distribution centres, etc. is reviewed. The development of an elimination by aspects model to analyse such location decisions by the managers of freight firms is described. The results are shown to be comparable to those obtained with a logit model. Five factors were found to be significant: closeness to existing customers, closeness to arterial roads, availability of suitable sites, cost of truck fleet operation, and closeness to labour. (TRRL)

This report was also published in *Transportation Planning and Technology*, Vol. 8, No. 4, 1984, p. 283-294.

Ogden, KW Young, W

Monash University, Australia, (0156-2126) Monograph Civil Eng Pap 83/2, June 1983, 22p, 4 Tab., 10 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 266519), Australian Road Research Board

ORDER FROM: Monash University, Australia, Department of Civil Engineering, Wellington Road, Clayton, Victoria 3168, Australia

47 381631

**A MODEL OF GOODS TRAFFIC IN AN URBAN REGION**

A model for the estimation of disaggregated trip generation in the goods traffic of urban regions was developed and implemented. The model is based on detailed surveys of economic traffic structures in urban regions. On this basis the origins-branches or groups of homogeneous or similar behaviour in regard to the kind of destinations and routing structures were selected and proved with methods of fundamental statistics. A special analysis of round trips with several destinations per tour was undertaken. These tours are characteristic of the goods traffic in urban regions. Furthermore the parameters of destination selection in regard to number of firms, number of employees and distance to the origin were calibrated by regression analysis. The trip generation of the goods traffic was computed for traffic zones relating the actual figures of the origins-number of firms or employees cars and of the destinations-number of employees or firms and distances. The model can be transferred to other urban regions—perhaps with a small random sample for calibration—where the actual figures of the

origin and destination zones are available. Further development of the ideas which led to the "separated split" concept used in this mnp model have produced a new generalised logit model which allows the incorporation of a full covariance matrix in the input data. This can be regarded as providing a reasonably good approximation to the mnp model (frequently better than the Clark approximation, and free from large errors), but requiring significantly simpler computational algorithms. The hierarchical logit and ordinary multinomial logit models are both special cases of the new generalised logit model. (Author/TRRL)

Transportation Analysis and Models. Proceedings of Seminar Q held at the PTRC 10th Summer Annual Meeting, University of Warwick, England.

Sonntag, H (Ivu Berlin (West)) *Planning & Transport Res & Comp, Sum Ann Mtg, Proc* 1983, pp 181-188, 5 Fig., 1 Tab., 4 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272781)

ORDER FROM: Planning and Transport Res and Computation Co Ltd, 110 Strand, London WC2, England

47 382626

**PRACTICES IN URBAN FREIGHT**

This report provides a detailed review of a selected number of actions taken by ten municipalities to address urban freight transportation or urban goods movement. The ten municipalities include seven examples of actions drawn from U.S. cities and three from Canadian cities. The research used literature, field visits, interviews, and independent research to formulate the presentation of the actions. An evaluation follows each action presentation to highlight the positive and negative results of each as they might affect application elsewhere. The actions consist of the following existing projects and practices in: travel demand forecasting; curb space management; off-street freight facilities; and zoning for off-street requirements. The authors note that the number of actions available for presentation in this report were limited by the lack of overall consideration of freight transportation by most municipalities and the practices included are somewhat non-traditional and successfully applied.

Habib, PA

Polytechnic Institute of New York, Urban Mass Transportation Administration Final Rpt UMTA-NY-11-0023-83-3, May 1983, 113p Contract NY-11-0023

ORDER FROM: NTIS PB84-141555

47 382799

**LOCAL AUTHORITIES ROLE IN PLANNING FOR FREIGHT**

Local authorities have an effect on freight movement through controls on land use, provision of infrastructure and traffic management. Research at Newcastle has attempted, through interviews with local authority officials and an examination of policy and planning documents, to ascertain the way local authority involvement is seen; the areas in which it is active and how well organised it is. Policies to control vehicle movement and parking to encourage parking facilities or driver facilities, to control development or land use policies to deal with city centre delivery problems are described. Approaches to organising planning for freight are also assessed. The results of a survey into the views freight operators hold of local authority interaction are also reported. After assessing current practice, the potential for improvements in the various policy areas are considered. Particular attention is given to the need for improved evaluation of lorry controls and greater attention to development control policies. (Author/TRRL)

Hall, MS

Newcastle upon Tyne University, England, (0306-3402) Monograph TORG Research Rpt 49, Dec. 1982, 68p, 2 Fig., 7 Tab., 89 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 273705)

ORDER FROM: Newcastle upon Tyne University, England, Transport Operations Research Group, Claremont Road, Newcastle NE1 7RU, Tyne and Wear, England

48 379446

**ENERGY IMPACTS OF TRANSPORTATION SYSTEMS MANAGEMENT ACTIONS**

Recent federal regulations have placed greater emphasis on analysis of energy issues in the Urban Transportation Planning Process. Part of these requirements include analysis of energy savings resulting from Transportation Systems Management (TSM) actions. This document is a handbook of simple analysis methods that can be used to assess the direct energy impact of TSM actions. It contains step-by-step instructions to complete worksheets that have been included. Sample case studies are also included which demonstrate the use of the analysis procedures. The methods discussed should appeal to a variety of user groups by requiring minimum data input; reasonable staff time and expertise; and no computer use.

New York State Department of Transportation, Urban Mass Transportation Administration, Office of the Secretary of Transportation Final Rpt. DOT-I-82-4, HS-034 264, Oct. 1981, 272p, Figs., Tabs., Refs

ACKNOWLEDGMENT: National Highway Traffic Safety Administration

ORDER FROM: NTIS UMTA-NY-09-8007-82-1

48 380209

**ORE—TECHNICAL DOCUMENT DT 125 (C 137). RAILWAY NOISE—DOCUMENTS FOR THE ASSESSMENT OF RAILWAY TRAFFIC NOISE [DOCUMENT TECHNIQUE DT 125 (C 137). BRUITS DANS LE DOMAINE FERROVIAIRE. DOCUMENTS POUR L'EVALUATION DU BRUIT DE TRAFIC FERROVIAIRE]**

This document sums up the present state of knowledge in the field of discomfort caused by noise, with details of levels and weighting values that can be objectively measured, the factors of subjective effects and interrelations between two aspects. This knowledge of fairly general scope is then applied to discomfort caused by railway noise, taking into account the special characteristics of the latter. The document is supplemented by a comparison with other means of transport, and lists rules for controlling railway noise. [French]

Lutz, R  
International Union of Railways ORE DT 125, Sept. 1981, 95p, 24 Tab., 52 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: UIC

48 380212

**THE PLACE OF ENERGY IN TRANSPORT—THE EXAMPLE OF SHORT-DISTANCE PASSENGER TRAFFIC [DER STELLENWERT DER ENERGIE IM VERKEHR—DAS BEISPIEL DES PERSONENNAHVERKEHRS]**

This analysis shows that an approach centered on energy problems takes no account of the quantitative criteria which transport modes must satisfy and consequently overassesses energy savings that can be made by the use of public transport. On the other hand, it is not the type of energy but the cost of energy that will be significant in the near future. Since energy costs only play a secondary role in public transport, it is probable that a more important development of short distance public transport will not be followed by significant savings for the community. [German]

Schade, D *Internationales Verkehrswesen* Vol. 35 No 2, 1983, pp 113-123, 1 Tab., 10 Phot., 9 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: Tetzlaff-Verlag GmbH, Havelstrasse 9, Postfach 4006, 6100 Darmstadt 1, West Germany

48 380827

**EVALUATION OF ALTERNATIVE FUELS FOR URBAN MASS TRANSIT BUSES. FINAL REPORT**

This study, sponsored by the Urban Mass Transportation Administration (UMTA), was performed for the Port Authority of Allegheny County, Pittsburgh, Pennsylvania. The objective was to identify an alternative fuel to diesel fuel in transit buses. Charts are presented that depict a two-level evaluation process for identifying the most appropriate alternative fuel for transit. Six fuels were selected and described in detail, namely: ammonia, ethanol, hydrogen, methanol, natural gas, and propane. A very detailed method for tabulating the presumed 12-year life cycle cost for a bus using

each of the six fuels was developed and explained in this report. Since none of the selected fuels can run in a diesel engine without modification, otto-cycle, dual-fueled diesel-cycle, and assisted-ignition diesel-cycle engine technologies were investigated as an important part of this study. The report states that the most efficient and versatile engine for the proposed fuels was an assisted-ignition diesel engine. The M.A.N. D 2566 FMUH is such an engine; it is capable of running on a variety of fuels. Methanol is currently being tested and demonstrated. This report includes a demonstration plan to test and evaluate the operation of methanol-fueled buses in northern (cold climates) cities. The report recommends that transit systems select an alternative fuel conversion approach with low initial cost and with the flexibility of converting back to the diesel fuel for a minimum cost and reconversion time; methanol is said to be the best within this context. This report provides a bibliography and appendices.

Booz-Allen and Hamilton, Incorporated, Urban Mass Transportation Administration Final Rpt. UMTA-PA-06-0060-83-1, Sept. 1983, 115p

ORDER FROM: NTIS PB84-105113

48 380835

**ENERGY CONSERVATION THROUGH TRANSIT AND RIDESHARING**

Using existing resources as efficiently as possible makes great sense in today's world—particularly in a municipal setting, where budgets seldom keep up with inflation. In this environment, the major challenge for transportation planners is to accommodate an increasing travel demand by using the existing road system more efficiently. One way to accomplish this goal is by encouraging commuters to shift to higher-occupancy vehicles. Ontario municipalities have a key role to play in the area of transportation. The challenge in public transit is to infuse new ideas into present systems and to discover which of the new techniques and technologies best apply to local conditions. The task in ridesharing, a new field for municipal involvement, is to set up systems that facilitate the implementation of carpools, vanpools, and the various forms of paratransit. This booklet outlines some of the specific measures that municipalities can put into effect in the transit and ridesharing areas to help meet current and future transportation needs while saving energy and dollars. (TRRL)

Ontario Ministry of Transportation & Communic, Can, Ontario  
Ministry of Energy Monograph Mar. 1983, 12p, 1 Fig., 2 Tab.

ACKNOWLEDGMENT: TRRL (IRRD 270852), Roads and Transportation Association of Canada  
ORDER FROM: Ontario Ministry of Transportation & Communic, Can, 1201 Wilson Avenue, Downsview, Ontario M3M 1J8, Canada

48 380836

**ENERGY CONSERVATION THROUGH TRAVEL DEMAND MANAGEMENT**

Flex-time, multi-family residential construction, and parking fees, are only a few of the measures that promise relief to municipalities in their search for creative solutions to transportation and energy challenges. This booklet contains a full range of other measures as well—ways that land can be used, alternative work schedules, innovative parking strategies, and zoning to restrict automobile traffic. Not only have these measures proved successful in reducing road congestion, saving fuel, and making better use of public transit; they are also economical. What they require of the municipality are planning and management rather than capital expenditure (Author/TRRL)

Ontario Ministry of Transportation & Communic, Can, Ontario  
Ministry of Energy Monograph Mar. 1983, 12p, 2 Fig

ACKNOWLEDGMENT: TRRL (IRRD 270853), Roads and Transportation Association of Canada  
ORDER FROM: Ontario Ministry of Transportation & Communic, Can, 1201 Wilson Avenue, Downsview, Ontario M3M 1J8, Canada

48 380873

**MODELLING REGIONAL ENERGY-USE: A LAND-USE, TRANSPORT, AND ENERGY-EVALUATION MODEL**

A mathematical model is described that may be used to compare and evaluate pairs of regional settlement patterns from the point of view of their use of energy. The model is specifically designed for the comparison of a range of hypothetical energy-efficient regional configurations with an empirically derived base case, each configuration being defined by a

minimal data set. The model consists of an integrated land-use and transport model coupled to a user-benefits evaluation procedure which processes the output from two separate runs of the land-use and transport model. (Author/TRRL)

Dene, A Rickaby, PA (Open University, Milton Keynes, England)  
**Environment and Planning B** Vol. 9 No. 4, 1982, pp 429-443, 12 Fig., 7 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 271160)  
ORDER FROM: Pion Limited, 207 Brondesbury Park, London NW2 5JN, England

**48 381030**  
**IDENTIFICATION AND RANKING OF TRANSPORTATION COST REDUCTIONS THROUGH ENERGY CONSERVATION STRATEGIES**

For many urban transportation agencies, energy conservation is one of the important goals in the development of their respective transportation programs. However, there is currently little information available to determine which strategies to implement and in which order to apply each of these strategies. This report responds to these concerns and details an analytical methodology for developing a comprehensive transportation energy conservation (TEC) program within an urban environment. Such a methodology is needed because of the high cost and the projected shortage of energy, the lack of an effective and comprehensive TEC evaluation tool, and the requirement for the optimal allocation of limited transportation funds. The objectives of this research were to: 1) compile data on TEC strategies through a literature search and contacts with concerned agencies in the United States; 2) identify and assess impact measures relative to TEC strategies; 3) develop a cost-effectiveness methodology for evaluating and ranking the various TEC strategies under given situations; and 4) apply the developed methodology to real-world cases in order to demonstrate its usefulness and practicability. A number of desirable features incorporated into the methodology are: 1) a comprehensive accounting of all relevant TEC strategy impacts; 2) an approach to assure compatibility among tangible and intangible impacts; 3) the link of the theoretical framework to the actual decision-making process; 4) the application of the multiattribute utility theory to the subjective impact assessment; and 5) an employment of the cost-effectiveness concepts. The case study demonstrated in this report of the Salt Lake City Metropolitan Area in Utah has demonstrated the methodology's utility, ease of application, and favorability by decision-makers and responsible agencies.

Yu, JC Pang, LMG  
Utah University, Urban Mass Transportation Administration Final Rpt. UMTA-UT-11-0002-83-2, Jan. 1983, n.p. Contract UT-11-0002  
ORDER FROM: NTIS PB83-251082

**48 381033**  
**AN EVALUATION OF ENERGY EMERGENCY CONTINGENCY PLANNING**

The objective of this research is to evaluate the transportation sector's energy preparedness planning for oil supply disruptions. The study focuses on transit, particularly the urban mass transit industry, and the impact that contingency measures have on the delivery of its services to the public. The investigation is based on a study of contingency plans assembled from transit authorities, Metropolitan Planning Organization (MPOs), and cities; a review of contingency planning efforts at the local, state, and Federal levels; a review of the expanding body of literature on transportation energy contingency planning; and site visits to several transit properties and local MPOs. It relies heavily upon existing reports and studies, with no attempt to develop new methodologies or assessment techniques. Thus, this study represents a status report on emergency energy contingency planning. This report provides a general background of the United States energy situation, a survey of contingency planning literature, a discussion of contingency planning in general, and case studies of the efforts of transit authorities to meet increased demand for services and to maintain mobility during an energy emergency. It provides a critical review of energy contingency planning, particularly as it relates to the transit industry. It is also a resource document for those transit properties and planning personnel who are in the process of completing or revising contingency plans.

Davis, EL

Atlanta University, Urban Mass Transportation Administration Final Rpt. UMTA-GA-11-0012-83-1, Mar. 1983, 81p Contract GA-11-0012  
ORDER FROM: NTIS PB83-255786

**48 381461**  
**THE ENERGY EFFICIENCY OF DIFFERENT MODES OF PERSONAL TRANSPORT [HENKILOLIKENTEEN ENERGIANKULUTUS ERI LIIKENEMUODOILLA]**

The energy consumption in personal transport is studied in the modes of private cars, taxis, buses, trains and aeroplanes. The total fuel consumption of the private car population can be deduced from the ECE-15 test results by making temperature and load corrections and weighing the results of urban cycle, 90 km/h and 120 km/h with 30%, 60% and 10%. The fuel consumption of taxi traffic per person km is higher than that of private cars because of the lower load factor. For the comparison of different modes the fuel consumption values have been transformed into crude oil kg's by making corrections to the refinery process and fuel transport. Additionally corrections to direct in-use fuel consumption of vehicles are made for the auxiliary operations of vehicles. The value of fuel needed in the building and maintenance of transport routes and in the types of vehicle is not calculated. [Finnish]

Kallberg, H  
Technical Research Centre of Finland, (0358-5085) Monograph VTT-TIED 160, 1982, 65p, 22 Fig., 17 Tab., 22 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272465), Technical Research Centre of Finland  
ORDER FROM: Technical Research Centre of Finland, SF-02150 Espoo 15, Finland

**48 381468**  
**TRANSPORT EFFICIENCY AND THE URBAN ENVIRONMENT. IS THERE A CONFLICT?**

This article is derived from a report by Metra Consulting Group for the Dutch Ministry of Public Health and the Environment. The aim of Metra's study was to identify ways of reducing the environmental nuisance of urban traffic without adding excessively to transport costs. The main theme of the article is that the traditional idea of an inherent conflict between transport efficiency and the environment is mistaken. Both efficiency and the environment are threatened by the same thing: the excessive and indiscriminate use of vehicles. This comes about because of defects in the fiscal and regulatory framework within which people take transport decisions. Suitable reforms in this framework would simultaneously enhance the environment and improve access for all classes of road user. In the development of this theme, particular attention is paid to transport activities which tend to be neglected by policy makers, such as walking, cycling and urban goods distribution, and to measures which are not always thought of as instruments of policy at all, such as locational policy and development control, vehicle design, and vehicle taxation, especially of goods vehicles.(a) (TRRL)

Plowden, S (Policy Studies Institute, London) **Transport Reviews** Vol 3 No. 4, Oct. 1983, pp 363-398, 3 Fig., 7 Tab., 42 Ref.

ACKNOWLEDGMENT: TRRL (IRRD 272584)  
ORDER FROM: Taylor and Francis Limited, 4 John Street, London WC1N 2ET, England

**48 381523**  
**ORE—QUESTION D 151. VIBRATIONS TRANSMITTED THROUGH THE GROUND. EFFECT OF VIBRATIONS ON BUILDINGS AND THEIR OCCUPANTS—ANALYSIS OF THE LITERATURE AND COMMENTARY**

This report deals with an analysis of existing literature relating to the effects of vibrations of different origin, but more particularly of railway origin, on buildings and their occupants. The greater part of the criteria relating to the sensitivity of human beings to vibrations and to the deterioration of structures are referred to. Mention is made of the absence of pertinent information in this field. Research topics are proposed.

International Union of Railways ORE D 151/RP 4, Sept. 1982, 57p, 18 Tab., 14 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: UIC



48 381554

**ENERGY CONSUMPTION IN ROAD TRANSPORT: DATA-COLLECTION REQUIREMENTS**

Despite recent softening in world oil prices, oil imports continue to represent a serious drain on the foreign-exchange reserves of many countries. As a result, governments throughout the world are pursuing a variety of policies—from increased exploitation of indigenous resources to conservation and other improvements in energy-conversion efficiency—in an effort to reduce their reliance on imported oil. Road transport, representing upwards of 30% of petroleum-product consumption in many countries, represents a logical target for such efforts. However, beyond the gross statistics available from oil company records on fuel sales, oftentimes little is known about precisely how this sizeable quantity of fuel is consumed. Without more specific data on the modal composition of road-transport demand, the energy-conversion characteristics of the vehicles serving that demand, the operational features of those vehicles, etc., governments cannot hope to develop the conservation programs so urgently needed. Data on road freight are particularly sparse and, given the developing supply/demand imbalance for middle-distillate fuels, current data gaps may well develop into future supply shortages or cross-subsidization issues. Since the mid-1970s, most of the nations of North and South America have mounted programs to collect data on the energy-consumption characteristics of road transport. This paper reports on one such effort now underway in Jamaica. While certain of the transportation and data-collection issues which influenced methodology selection may be unique to that country, others are common to many countries at similar levels of urbanization, motorization, and income. With appropriate modification to account for distinctive local conditions, the Jamaican data-collection procedure has broad applicability, in whole or in part, to a variety of national and regional contexts.

Panamerican Transport Congress Meeting, Buenos Aires, Argentina, 31 May 1983.

Millar, M Bernard, MJ

Argonne National Laboratory, Department of Energy CONF-8305104-1, June 1983, 21p Contract W-31-109-ENG-38

ORDER FROM: NTIS DE83014737

48 381555

**IDENTIFICATION AND CONDENSATION OF RAILWAY FUEL-SAVINGS MEASURES AND STRATEGIES**

This paper documents the results of a project undertaken by the Center for Transportation Research of Argonne National Laboratory to accomplish the following objectives: (1) assemble reliable and current information available in published or unpublished form on measures to conserve petroleum fuel in the United States rail carrier industry; (2) update and, as necessary, revise this information based on direct interaction with experts in the rail industry, government, and academia; and (3) prepare and distribute throughout the US rail industry a concise, comprehensive summary of this information in the format of a chart, or matrix of fuel saving measures. The final product of this project, a Rail Energy Efficiency Measures Matrix (hereafter, the matrix), was distributed to over 120 United States domestic rail carriers late in 1982. Central to the effort expended in developing this matrix, and indispensable to its content, was a meeting held in Chicago, Illinois, in February 1982 to coordinate the views and findings of railway operations supervisors, fuel conservation officers, and researchers from both the rail industry and US universities. The discussions which follow present the organizational format of the matrix, its component elements (fuel savings measures and strategies), and important contrasts regarding these elements between information found in the literature the collective viewpoint of the experts who attended the February 1982 meeting. A final section presents the measures found to be most important by consensus of these experts.

Panamerican Transport Congress Meeting, Buenos Aires, Argentina, 31 May 1983.

Saricks, CL Bertram, KM Smith, JE

Argonne National Laboratory, Department of Energy CONF-8305104-2, June 1983, 21p Contract W-31-109-ENG-38

ORDER FROM: NTIS DE83014738

48 381582

**INITIATIVES FOR CONSERVING TRANSPORTATION ENERGY THROUGH TELECOMMUNICATIONS**

The US Department of Energy is defining a program for promoting transportation energy conservation through the use of telecommunications. Assisting the effort, The MITRE Corporation has examined various telecommunications-related ways of saving transportation energy, and has sifted those with significant potential from those with little or no potential. This report describes the candidate initiatives examined, the evaluation methodology used, and the results obtained.

Obermann, RM Zobrak, MJ Hentz, RS

Mitre Corporation, Department of Energy MTR-80W94, June 1980, 101p

ORDER FROM: NTIS DE83012389

48 381888

**TRANSIT BUS FUEL ECONOMY RESEARCH**

A new method of comparing the fuel economy of transit buses has been demonstrated. The method is based on SAE J1321. The SAE test procedure was combined with the Transit Coach Design Operating Profile Duty Cycle from the "White Book" (2) and the test track configuration to produce MPG data for the commuter, arterial, and central business district phases of the duty cycle and MPG data for the combined or overall test cycle. The resulting test procedure makes possible the determination of MPG on a wide range of revenue duty cycles and could be useful in calculating life-cycle cost of transit buses. The six 40-foot buses used in this series of tests were produced by six different manufacturers and featured different drive configurations, curb weights, and seating capacities.

West Coast International Meeting Vancouver, British Columbia, August 8-11, 1983.

Francis, GA (Battelle Columbus Laboratories) **SAE Technical Paper Series** SAE 831185, HS-035 948, 1983, 21p, 15 Fig., 4 Tab., 3 Ref., 1 App.

ACKNOWLEDGMENT: National Highway Traffic Safety Administration

ORDER FROM: Society of Automotive Engineers, Incorporated, 400 Commonwealth Drive, Warrendale, Pennsylvania, 15096

48 382260

**FUTURE COAL-BURNING STIRLING ENGINES**

The high price and limited availability of oil fuel are discussed as a motive to return to coal as the primary fuel. This provides unprecedented opportunities for applications of Stirling engines to stationary power and automotive applications over a broad spectrum. For heavy automotive application in railway locomotives and the larger off-highway mining and earth moving vehicles, it appears possible for Stirling engines of corresponding power and efficiency to replace diesels in the same installation envelope.

Walker, G (Calgary University, Canada), Fauvel, R Srinivasan, S Gustafson, R Van Benthem, J **Institution of Mechanical Engineers, Proc Part A** Vol. 197 Jan. 1983, n p., 18 Ref.

ACKNOWLEDGMENT: EI

ORDER FROM: ESL

48 382275

**PSYCHO-PHYSIOLOGY OF THE WELFARE OF LINESIDE RESIDENTS**

The authors begin by examining the positive and negative aspects of disturbances caused by trains to the physical and social environment of lineside residents. They then consider the specific nature of train noise as perceived by these residents and its physical and physiological characteristics, with particular reference to its effect on sleep patterns. They conclude by detailing the results of various studies in different countries and suggest that the conventional noise measurement index (Leq) used in isolation is an inadequate indication. Future research is outlined, including the aspects of vibration, dust and smell.

Vernet, M Coblenz, A **French Railway Review** Vol 1 No. 5, Oct. 1983, pp 447-450

ACKNOWLEDGMENT: British Railways

ORDER FROM: North Oxford Academic Publishing Limited, 242  
Banbury Road, Oxford OX2 7DR, England

48 382293

**ENVIRONMENT, TRANSPORT, SOCIAL CHANGE. AN ENVIRONMENTAL TRANSPORT MODEL FOR SWITZERLAND [UMWELT, VERKEHR, UMKEHR. UMWELTGERECHTES VERKEHRS-LEITBILD FUER DIE SCHWEIZ]**

The Swiss Transport Club has proposed an alternative transport policy, based on respect for man and his environment, to replace present policy. The new policy would hinge on five essential principles: avoidance of unnecessary transport, conversion of motor vehicle traffic into non-motorized traffic, transfer of private car traffic to the public transport sector, protection of the environment at source and on communications routes, and finally cost coverage, including social costs. [German]

Schweingruber, B

Swiss Transport Club CFF 1.32287, 1983, 288p, 30 Tab., 94 Phot., 56 Ref.

ACKNOWLEDGMENT: International Union of Railways, BD

ORDER FROM: Swiss Transport Club, Herzogenbuchsee, Switzerland

48 382604

**ENERGY USE IN GROUND TRANSPORTATION**

Transportation systems account for approximately twenty-five percent of the country's total energy consumption. Such a large fraction on the Nation's energy resources has prompted increased awareness of the role which transportation technology plays in the area of energy consumption. Of the different transportation modes, automobiles and trucks combine to consume approximately three-quarters of all transportation energy as of 1980. The report stresses that the importance of technologies aimed at reducing these large expenditures of our Nation's resources cannot be minimized.

Karlin, A Riviera, A McDonald, M Turner, D Stuckler, J Booz-Allen and Hamilton, Incorporated, Urban Mass Transportation Administration, Transportation Systems Center Final Rpt. UMTA-MA-06-0153-83-2, DOT-TSC-UMTA-83-12, June 1983, 76p Contract DOT-TSC-UMTA-83-12

ORDER FROM: NTIS PB84-131713

48 382761

**TRANSPORT, TRAVEL AND ENERGY IN THE UK: TREND ANALYSIS OF PUBLISHED STATISTICS**

Concentrating on the road and rail sectors of transport this article presents an intermodal comparison of energy consumption trends on a time series basis. The underlying reasons are explored and some of the complex interactions are highlighted. Several options for reducing energy consumption in the transport sector are proposed. To reduce the national levels of primary energy consumption by 1% eight options have been considered. The most acceptable are the increase in vehicle occupancy rates, technical improvements in vehicle efficiency and the switch from petrol to diesel engined vehicles. It is felt that government should take a positive lead in these fields e.g. Positive discrimination for car sharers in terms of priority parking and use of the road network (bus lanes), and the introduction of fiscal measures to encourage the purchase of diesel-engined vehicles. It is recommended that a review be carried out of the statistics and information that are available on energy use in transport. (Author/TRRL)

Banister, C (Manchester University, England); Banister, D (University College, London) *Energy Policy* Vol. 11 No. 1, Mar. 1983, pp 39-51, 11 Tab., Refs.

ACKNOWLEDGMENT: TRRL (IRRD 273554)

ORDER FROM: ESL

48 384624

**ASSESSMENT OF NATIONAL ENERGY-SAVING POLICIES FOR TRANSPORTATION**

Two strategies for saving energy in urban transportation were tested in three cities for their impact on the environment. The impacts of these strategies were contrasted to those occurring under the extension of policies in place in 1980. Key results included increased indirect energy use by transportation towards the end of this century; lack of impact on critical materials in building new, more fuel-efficient vehicles for urban travel; the dominance of fuel price increases in achieving the substantial energy

savings projected by the year 2000; the differential impacts between fast growing and stable metropolitan areas; and the projection that both emissions and energy standards for urban vehicles can be met. Substantial energy savings were projected under all conditions; 40% savings were expected in the year 2000, relative to 1980, even under policies in place in 1980. The assumed rate of fuel price increase, from 3 to 5% per year depending upon the scenario, proved to be crucial in achieving these energy savings. Increased automotive fuel economy alone could not achieve energy savings in the long run. Further savings were achieved under each of the two strategies tested: Individual Travel, which promoted more fuel efficient automobiles than expected under In-Place Policies; and Group Travel, which promoted the use of transit systems by improved service and lower fares, and discouraged the use of autos by increased fuel taxes and parking taxes. Greater energy savings were achieved under Group Travel Strategy than under Individual Travel. In general, these energy savings were achieved without great cost to the environment or to specific social groups, even though impacts did vary by group.

LaBelle, SJ Moses, DO

Argonne National Laboratory CONF-830847-2, Aug. 1983, 14p

ORDER FROM: NTIS DE84000585

48 384651

**OVERVIEW OF TRANSPORTATION AND STATIONARY-SOURCE CONTROL OPTIONS**

An introduction to the subject of cost-effectiveness in selecting air-pollution control options is provided by offering an overview of control options for both stationary and mobile sources of air pollution and by identifying some historical obstacles to comparative analysis. After the traditional stationary-source control options presented in the U.S. Environmental Protection Agency guideline document Control Techniques for Volatile Organic Emissions from Stationary Sources are summarized, mobile-source control options, including transportation control measures, are described and grouped by applying the stationary-source categorization scheme. Some cost-effectiveness analysis problems common in evaluating both transportation and stationary-source controls are identified and the institutional obstacles that continue to inhibit effective comparative analysis and problem solving are noted.

This paper appeared in Transportation Research Record No. 921, Cost-Effectiveness of Air-Quality Control Measures and Impact of the Environmental Review Process.

McLean, BJ (Environmental Protection Agency) *Transportation Research Record* No. 921, 1983, pp 1-4, 2 Ref.

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48 384652

**CASE STUDIES OF COST-EFFECTIVENESS OF TRANSPORTATION MEASURES TO IMPROVE AIR QUALITY**

Many transportation agencies claim that transportation system management measures are not cost effective for purposes of air quality, although these same measures are used to accomplish other transportation objectives. This contention is examined by first discussing the issues that are important in performing a cost-effectiveness analysis and then presenting examples of the results of 31 separate analyses in 19 different urban areas. To develop consistent and comparable results in terms of the standard air-quality measure of dollars per ton of pollutant eliminated, it is necessary to examine the net present value of the time stream of all potential costs, benefits, and emissions reductions, because transportation measures normally contribute to the accomplishment of multiple objectives. The results indicate that the benefits of implementing transportation-type air-quality measures frequently exceed their associated costs and that transportation measures are comparable in terms of cost-effectiveness to vehicle inspection and maintenance and stationary-source controls. The implication of these findings is that transportation measures have a legitimate role to play not only in state implementation plans but also as part of the emissions-trading program of the U.S. Environmental Protection Agency.

This paper appeared in Transportation Research Record No. 921, Cost-Effectiveness of Air-Quality Control Measures and Impact of the Environmental Review Process.

Suhrbier, JH (Cambridge Systematics, Incorporated) *Transportation Research Record* No. 921, 1983, pp 5-9, 3 Fig., 2 Tab., 1 Ref.

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48 384653

**METHODOLOGY FOR DETERMINING THE RELATIVE COST-EFFECTIVENESS OF STATIONARY-AND MOBILE-SOURCE CONTROLS**

A methodology for determining the relative cost-effectiveness of both stationary and mobile-source controls (including transportation controls) is described and the results of applying this methodology to the Philadelphia Air Quality Control Region (AQCR) are discussed. First, the methodology is reviewed in terms of a five-step process: (a) adjustment of emission inventories, (b) determination of the initial list of controls, (c) determination of cost and emission reductions, (d) determination of other effects, and (e) evaluation of control strategies. Second, the methodology is illustrated through an application to the Philadelphia AQCR. Third, conclusions and implications of the relative cost-effectiveness of stationary and mobile-source controls are presented.

This paper appeared in Transportation Research Record No. 921, Cost-Effectiveness of Air-Quality Control Measures and Impact of the Environmental Review Process.

Bellomo, SJ (Bellomo-McGee, Incorporated) **Transportation Research Record** No. 921, 1983, pp 9-13, 6 Fig., 1 Ref.

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48 384654

**GUIDANCE FROM DISAGGREGATE EMISSIONS INVENTORY IN SELECTION OF CONTROL MEASURES**

A three-phase plan for development of an air-quality control program is discussed. The Council of Governments in Washington, D.C., has developed a plan in which phase 1 consists of development of a disaggregate emissions inventory, projection of emission levels for 1981, and sensitivity analyses. In phase 2 the control measures are defined and evaluated. Phase 3 involves seeking commitments by local governments and writing the plan.

This paper appeared in Transportation Research Record No. 921, Cost-Effectiveness of Air-Quality Control Measures and Impact of the Environmental Review Process.

Bailey, K Clifford, M Shapiro, P (Metropolitan Washington Council of Governments) **Transportation Research Record** No. 921, 1983, pp 13-18, 17 Fig.

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48 384664

**LOCAL ECONOMIC IMPACTS OF TRANSPORTATION FUEL CONSUMPTION. PART I: DERIVATION OF PROCEDURE. PART II: PLANNING MANUAL**

This manual provides a tool for planners at the local level to use in assessing the localized economic impacts of transportation fuel price changes. The publication is divided in two parts: Derivation of Procedure and Planning Manual. A change in the price of gasoline can be expected to have an impact on the local economy of an urban area. In order to trace such impacts and to institutionalize analyses of this type, the North Central Texas Council of Governments studied the application of an input-output, or inter-industry, model to the Dallas-Fort Worth area. Economic impacts of transportation energy expenditures are both direct and indirect. Chapters in Part I: Overview of Procedures; Energy Efficiency and Price Scenarios; Sector Energy Consumption; Consumer Price Index Changes; Total Economic Impacts; Suggestions for Use of Manual. The chapters in Part II: Introduction; Energy Efficiency and Price Scenarios; Sector Energy Consumption—Households; Sector Energy Assumption—Trucks; Resulting Changes and Impacts; Summary. It is concluded that by evaluating the changes in household and trucking expenditures from proposed scenarios a great deal can be learned about the effects of policy/engineering decisions in energy economics. One finding: Future energy prices and inadequate fuel

efficiency improvements for the truck fleet will lead to a significant increase in household expenditures due to higher trucking costs.

North Central Texas Council of Governments, Federal Highway Administration, Urban Mass Transportation Administration, Department of Energy DOT-I-84-01, Jan. 1984, v.p., 2 Tab., Refs., 8 App.

ORDER FROM: OST

48 384665

**A USER'S GUIDE FOR CORPORATE TRANSPORTATION ENERGY MANAGEMENT**

This Guide has been developed to assist employers in programs to have viable substitutes for commuting in the single-occupant vehicle. Increasing costs, growing traffic congestion, threat of recurring petroleum supply shortages, and public sentiment for improved commute-to-work patterns can all encourage employees to seek alternative modes of travel. The alternative commuting opportunities are organized in 9 areas: Public transit, ridesharing, alternative work schedules, parking, bicycling, alternative fuels, fuel control systems, emergency preparedness planning, and administration. It is considered essential that each organization designate a Transportation Coordinator to encourage use of alternate travel modes, improve vehicle fleet performance, and develop a plan for responding to an emergency fuel interruption. There can be an improved public image of the firm, better employer/employee relations, reduced costs, improved efficiency and enhanced preparedness.

Kentuckiana Regional Planning & Development Agency, Federal Highway Administration, Urban Mass Transportation Administration Aug. 1983, v.p., Figs., Tabs., Refs.

ORDER FROM: Kentuckiana Regional Planning & Development Agency, 914 East Broadway, Louisville, Kentucky, 40204

48 384879

**ORE, QUESTION D 151—THEORETICAL PREDICTION OF GROUND VIBRATIONS AND COMPARISON WITH EXPERIMENTAL RESULTS**

The work of the Committee is continuing beyond the conventional theoretical result presented in its first report (RP 1) to take more detailed account of the particular features of railway-induced ground vibrations. This report describes the first stages of the work, including the principles involved in the modelling of ground, track and vehicles and outlines initial applications of the theoretical studies in comparison with experimental results.

International Union of Railways ORE D 151/RP3, Apr. 1983, 61p, 6 Tab., 30 Phot.

ACKNOWLEDGMENT: International Union of Railways, BD  
ORDER FROM: UIC

48 385269

**THE TROLLEY BUS AND THE ENVIRONMENT**

Bo Persson, of the National Swedish Environmental Protection Agency summarizes the current status of environmental knowledge concerning trolley bus operations in urban areas.

This paper appeared in TRB Special Report 200, The Trolley Bus: Where It Is and Where It's Going. Based on the Workshop on Trolley Bus Applications, August 29-September 1, 1982, Seattle, Washington conducted by TRB and sponsored by UMTA.

Persson, B **Transportation Research Board Special Report** No 200, 1983, pp 27-31

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11 349150

**SMALL TRANSIT BUSES: A MANUAL FOR IMPROVED PURCHASING, USE, AND MAINTENANCE**

The general objective of this research is to develop a workbook-style manual for local transit operators and to identify key recommendations that might be taken by transit operators, local governments, states and UMTA to substantially improve the procurement, appropriate use, and maintenance processes for small transit buses. Available small buses are highly diverse in both capital costs and technology, and their uses are also highly diverse. The complexity of both needs and possible solutions has led to many poor choices of buses for specific duties. In addition, uncertainties with respect to the small bus market have led to a lack of continuity in design and development; perceived problems in bus operation, maintenance, and reliability; a lack of clear definition of bus demand; and little standardization within realistic price ranges. This manual is intended to provide guidelines to help both experienced and inexperienced transit providers make objective decisions regarding cost-effective procurement, maintenance and operation of buses in wide range of local, institutional, service, and operating environments.

PERFORMING AGENCY: Little (Arthur D), Incorporated  
 INVESTIGATOR: Nayak, PR Tel (617) 864-5770  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Kingham, RI Tel (202) 334-3224 NCTRP 30-1  
 STATUS: Active NOTICE DATE: Jan. 1984  
 START DATE: Nov. 1982 COMPLETION DATE: Aug. 1984  
 TOTAL FUNDS: \$299,378  
 ACKNOWLEDGMENT: National Cooperative Transit Res and Dev Program

11 362086

**IMPROVED SERVICE LIFE OF URBAN TRANSIT COACH BRAKES**

Existing and future urban transit coach brake life is to be improved. This will involve quantification of in-service brake operating temperatures and identification of methods for reduction of such temperatures along with possible alternative friction materials. Phase I will attempt to confirm that temperature is the cause of reduced brake life by collection and evaluation of brake operating temperatures, a process made possible by instrumentation that can be applied to brake drums and brake shoes. This was confirmed by tests on a bus of the Central Ohio Transit Authority in Columbus, Ohio. Task I was continued by instrumentation of three types of buses of the Southern California Rapid Transit District in Los Angeles. Task II will involve development of methods for reducing operating temperature or identifying friction materials that are compatible with service temperatures. Task III will involve a cost-benefit analysis of the methods developed for increasing brake life. Task IV will be the preparation of an interim report for implementation of an interim report for implementation of the recommendations in Phase II which will include actual tests by a major metropolitan bus operator.

PERFORMING AGENCY: Battelle Memorial Institute  
 INVESTIGATOR: Hopper, AT Tel (614) 424-6424  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Smith, HA Tel (202) 334-3224 NCTRP 47-1  
 STATUS: Active NOTICE DATE: May 1984  
 START DATE: Dec. 1981 COMPLETION DATE: 1984  
 TOTAL FUNDS: \$300,000  
 ACKNOWLEDGMENT: National Cooperative Transit Res & Dev Program

11 369377

**EFFECTS OF FUEL ADDITIVES AND ALTERNATIVE FUEL GRADES FOR TRANSIT BUSES**

The synthesis will compile data on the effects, costs and benefits of available fuel additives and related products based on actual in-service experience and research, and should examine the effects on long-term engine maintenance, pollution and odor emissions, fuel economy, fuel storage and engine performance. Specifically the synthesis will include various classes of additives such as dispersants, stabilizers, corrosion inhibitors, heavy metal scavengers, pour point/cloud point depressants, emulsifiers, emulsion breakers, biocides, slime dispersants, atomizers, combustion catalysts, cetane improvers, deposit cleaners, and smoke and odor suppressants; and

information from literature, operators, engine and additive manufacturers, trade groups and research organizations.

Report in preparation

PERFORMING AGENCY: Southwest Research Institute  
 INVESTIGATOR: Sefer, N Tel (512) 684-5111 Moulton, S Tel (512) 684-5111  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Copas, TL Tel (202) 334-3242 NCTRP 60-1, TS-3  
 STATUS: Active NOTICE DATE: May 1984  
 START DATE: Oct. 1982 COMPLETION DATE: July 1984  
 TOTAL FUNDS: \$30,000  
 ACKNOWLEDGMENT: National Cooperative Transit Res & Dev Program

11 384949

**BRAKES AND HOURMETER VS MILEAGE FOR PREVENTIVE MAINTENANCE**

Establish data base on GMC third-generation brakes on RTS buses. Evaluate brake maintenance procedures utilizing brakes with asbestos and non-asbestos linings. Evaluate aluminum wheel hubs which reduce wheel temperature and increase brake and tire life. Evaluate engine-hour against mileage as a basis for scheduling preventive maintenance. Information from these tests will assist transit agencies and bus manufacturers

PERFORMING AGENCY: New York City Transit Authority, NY-06-0112  
 INVESTIGATOR: Cameron, D Tel (212) 498-8149  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483

STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: 1984  
 ACKNOWLEDGMENT: UMTA

11 384950

**AUTOMATIC BUS LUBRICATION**

Assess the feasibility of an automatic grease lubrication system to be installed on 47 buses and operated for one year to determine reliability, costs and benefits. Up to 30 points will be greased automatically. In cold weather grease becomes frozen as do the grease fittings, interfering with adequate lubrication.

PERFORMING AGENCY: Niagara Frontier Transportation Authority, NY-06-0091  
 INVESTIGATOR: Casciotti, D Tel (716) 855-7300  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483

STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: 1983  
 ACKNOWLEDGMENT: UMTA

11 384951

**REAR TOW HOIST FOR ADBS**

Develop and test a special tow-hoist for ADB transit buses to permit moving units with frozen differentials without having to pull axles in high-density traffic and perform a study of a modified vacuum system to remove fare revenue with increased security and greater speed.

PERFORMING AGENCY: Metropolitan Suburban Bus Authority, NY-06-0093  
 INVESTIGATOR: Dunn, G Tel (516) 542-0720  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483

STATUS: Active NOTICE DATE: Apr. 1984  
 ACKNOWLEDGMENT: UMTA

11 384952

**STANDARD LOW FLOOR BUSES**

This project involves test and evaluation of bus design features including low floors and wide doors to assess cost, performance and passenger accessibility. Test results will be disseminated to the transit industry after appraisal of 20 buses is completed.

PERFORMING AGENCY: Metropolitan Transit Commission, UMTA-MN-06-0017

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Ridgely, JE (URT-21) Tel (202) 426-8483 Contract UMTA-MN-06-0017

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: 1984 COMPLETION DATE: Oct. 1986

ACKNOWLEDGMENT: UMTA

## 11 384955

### BUS TRANSMISSION AND BRAKE RETARDER DEMONSTRATION

This project will test and evaluate various electronic and non-electric controls for transmissions to determine relative performance, reliability maintainability and life cycle costs. Life cycle costs will be collected on a fleet of Neoplan buses with and without Telma electric brake retarders. The electronically controlled in-line transmission with hydraulic retarder has the potential to increase fuel economy and lower maintenance costs. Transmissions are right-hand rotation to allow overall powertrain to be less expensive than left hand drive bus equipment.

PERFORMING AGENCY: Southeastern Pennsylvania Transportation Authority, UMTA-PA-06-0082

INVESTIGATOR: DePallo, M Tel (215) 456-4659

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483 Contract UMTA-PA-06-0082

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: 1983

ACKNOWLEDGMENT: UMTA

## 11 384956

### SMALL BUSES WITH TURBOCHARGED ENGINES

This project involves test, demonstration and evaluation of small bus design features including turbocharged diesels and computerized fuel mixture systems to assess cost, performance, fuel efficiency, reliability and costs. Evaluation to be performed on 10 buses with results to be disseminated to the transit industry for future purchasing decisions.

PERFORMING AGENCY: District of Columbia Department of Transportation, UMTA-DC-06-0464

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Ridgely, JE (URT-21) Tel (202) 426-8483

STATUS: Active NOTICE DATE: Apr. 1984

ACKNOWLEDGMENT: UMTA

## 11 384957

### SMALL BUSES, LOW FLOOR, DISC BRAKES

This project involves test, demonstration and evaluation of 5 small buses with low floors and disc brakes to assess cost, performance, passenger accessibility, fuel efficiency and maintenance costs. The results will be disseminated to other potential purchasers.

PERFORMING AGENCY: Central New York Regional Transportation Authority, UMTA-NY-06-0113

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Ridgely, JE (URT-21) Tel (202) 426-8483 Contract UMTA-NY-06-0113

STATUS: Active NOTICE DATE: Apr. 1984

ACKNOWLEDGMENT: UMTA

## 11 384959

### ROOF-MOUNTED AIR CONDITIONING

Thermo King air conditioning units on 35 AMG buses will be replaced with Suetrak units that are mounted on top of the bus. In-line placement of condenser and engine radiator has resulted in engine overheating; lower maintenance costs can also be achieved. Rehabilitated buses worked well; and air damper will also be provided to evaluate its ability to reduce costs.

PERFORMING AGENCY: Central New York Regional Transportation Authority, UMTA-NY-06-0094

INVESTIGATOR: Gambaccini, M Tel (315) 471-2100

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483 Contract UMTA-NY-06-0094

STATUS: Active NOTICE DATE: Apr. 1984

ACKNOWLEDGMENT: UMTA

## 11 384960

### BRAKE RETARDER FOR SMALL BUS

This activity is to reduce high maintenance costs for brakes on small transit buses. It will involve installation, test and evaluation of electric brake retarders on six 22-foot Thomas buses. Brake retarders are expected to increase brake lining life 4 to 5 times, reducing the frequent maintenance and adjustment now needed. This will increase bus availability. Life cycle costs will be collected.

PERFORMING AGENCY: Central New York Regional Transportation Authority, UMTA-NY-06-0118

INVESTIGATOR: Gambaccini, M Tel (315) 471-2100

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483 Contract UMTA-NY-06-0118

STATUS: Active NOTICE DATE: Apr. 1984

ACKNOWLEDGMENT: UMTA

## 11 384961

### ARTICULATED BUSES, TRANSVERSE ENGINES

This project involves test and evaluation of articulated buses with transverse rear engine and air conditioning with engine-driven compressor to assess cost, performance, fuel efficiency, reliability and costs. Tests to be conducted on 15 buses with results disseminated to the transit industry.

PERFORMING AGENCY: Metropolitan Transportation Authority, UMTA-NY-06-0115

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Ridgely, JE (URT-21) Tel (202) 426-8483 Contract UMTA-NY-06-0115

STATUS: Active NOTICE DATE: Apr. 1984

ACKNOWLEDGMENT: UMTA

## 11 384962

### ARTICULATED BUSES, HIGH STRENGTH CHASSIS

This project involves test and evaluation of articulated buses with high-strength chassis and electronically controlled transmission to assess cost, performance, fuel efficiency, reliability and costs. Tests will be made with 10 buses and results disseminated to the transit industry.

PERFORMING AGENCY: Metropolitan Transportation Authority, UMTA-NY-06-0014

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Ridgely, JE (URT-21) Tel (202) 426-8483

STATUS: Active NOTICE DATE: Apr. 1984

ACKNOWLEDGMENT: UMTA

## 11 384963

### TANDEM ARTICULATED BUSES—NBEI

This project involves two articulated buses with features including wheelchair capability to assess cost, performance and passenger accessibility. Results will be disseminated to the transit industry.

PERFORMING AGENCY: Florida Department of Transportation, UMTA-FL-06-0039

INVESTIGATOR: Duffy Tel (904) 488-7390

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Ridgely, JE (URT-21) Tel (202) 426-8483 Contract UMTA-FL-06-0039

STATUS: Active NOTICE DATE: Apr. 1984

ACKNOWLEDGMENT: UMTA

## 11 384974

### TECHNICAL ASSISTANCE IN TROLLEY BUSES

This project is to provide technical assistance in areas of trolley bus and electric propulsion technology. The input will aid in development of a research program. The tasks: (1) Literature review; (2) Report on state of development of European trolley buses; (3) Report on U.S. trolley bus operations; (4) Recommendation for research and technical assistance in trolley bus operations and maintenance; (5) Update report. Justification includes estimate that by 2000 diesel fuel cost will be 65 cents per vehicle miles, electricity 21 cents per mile.

A performing agency is yet to be determined.

SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Sullivan, PJ (URT-21) Tel (202) 426-8483 Contract UMTA-IT-06-0314  
 STATUS: Active NOTICE DATE: Apr. 1984  
 ACKNOWLEDGMENT: UMTA

**11 384975****870 AIR CONDITIONING RETROFIT**

This project will test and evaluate 20 Model 05GE Carrier air conditioning systems as replacement units for the original units supplied with Grumman Flxible 870 Advanced Design buses. As compared with the dual units originally installed, the new systems will offer increased capacity, lower operating and maintenance costs and simplified operation.

PERFORMING AGENCY: Metropolitan Atlanta Rapid Transit Authority  
 INVESTIGATOR: Huggins, J Tel (404) 586-5000  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483 Contract UMTA-GA-06-0016  
 STATUS: Active NOTICE DATE: Apr. 1984  
 ACKNOWLEDGMENT: UMTA

**11 384976****FUEL ECONOMY AND PERFORMANCE SIMULATION**

The activity will provide technical information to public transit agencies on fuel economy and performance impacts that result from changes in bus configuration, fuels or operating procedures. Simulation analyses using the HEVSIM program, will be conducted to assess the impact of various bus design or operational changes. Since fuel represents a large cost over the life of a transit vehicle, information on trade-offs of fuel economy, performance and bus design will be useful in investment decisions.

PERFORMING AGENCY: Transportation Systems Center, UMTA-MA-06-0120(I)  
 INVESTIGATOR: Gundersen, R Tel (617) 494-2654  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Lopez, RA (URT-21) Contract UMTA-MA-06-0120(I)  
 STATUS: Active NOTICE DATE: Apr. 1984  
 ACKNOWLEDGMENT: UMTA

**11 384978****ENGINE MODIFICATION**

Establish operational and cost benefits of new and improved engines that replace existing power plants; disseminate information to transit agencies. One New Look bus will be fitted with Cummins L-10 engine with Voith T-drive transmission. Five buses will get DDA electronic injection controlled engines. All engines have potential for improved fuel economy, lowered lubricating oil consumption and emissions, and better maintainability.

PERFORMING AGENCY: Michigan Department of Transportation, MI-06-0037  
 INVESTIGATOR: Boctor, K Tel (517) 322-1090  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483  
 STATUS: Active NOTICE DATE: Apr. 1984  
 ACKNOWLEDGMENT: UMTA

**11 384979****EVALUATION OF RETROFITTED BONDED BRAKES**

Collect data and determine cost effectiveness of retrofitting bonded brake linings on buses previously fitted with bolted linings. Benefits of bonded linings estimated at \$7 million annually. Tests on 8 buses indicate increased life of about 11 percent.

PERFORMING AGENCY: Southeastern Michigan Transportation Authority, MI-06-0031  
 INVESTIGATOR: Kirshan, K Tel (313) 256-8629  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483  
 STATUS: Active NOTICE DATE: Apr. 1984  
 ACKNOWLEDGMENT: UMTA

**11 384980****TREADLE SENSORS**

Evaluate improved passenger counter treadle sensor mats and beam sensor counters and evaluate their accuracy and reliability. Improved counters have promise for better counting. Test results are useful nationwide.

PERFORMING AGENCY: Southern California Rapid Transit District, UMTA-CA-06-0119  
 INVESTIGATOR: Styffe, A Tel (213) 972-6613  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483 Contract UMTA-CA-06-0119  
 STATUS: Active NOTICE DATE: Apr. 1984  
 ACKNOWLEDGMENT: UMTA

**11 384999****VALIDATION OF ARTICULATED BUS LIFE CYCLE COSTING**

The objective of the articulated bus project is to develop life cycle costing (LCC) data prior to revenue service tests; compile extensive operations and maintenance data during tests; measure data against performance; and incorporate LCC into procedures for procurements. Data collection has started on 30 articulated buses (15 M.A.N. and 15 Crown Ikarus). Information gained from SCTD's LCC procurement experience helps operators in bus procurements and results in more cost effective vehicle procurements.

PERFORMING AGENCY: Santa Clara County Transit District, UMTA-CA-06-0146  
 INVESTIGATOR: Bachman, D Tel (408) 299-2362  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Asatoorian, SD (URT-21) Tel (202) 426-8483 Contract UMTA-CA-06-0146  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Sept. 1983 COMPLETION DATE: Oct. 1985  
 TOTAL FUNDS: \$300,000  
 ACKNOWLEDGMENT: UMTA

**11 385012****NEW BUS EQUIPMENT INTRODUCTION PROGRAM**

Test and evaluate 5 articulated buses with rear axle drive, wide door and low floor.

PERFORMING AGENCY: Rhode Island Public Transit Authority, RI-06-0013  
 INVESTIGATOR: Ruble, B Tel (401) 781-9450  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-21) Tel (202) 426-8483  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: June 1982 COMPLETION DATE: June 1984  
 TOTAL FUNDS: \$100,000  
 ACKNOWLEDGMENT: UMTA

**11 385013****NEW BUS EQUIPMENT INTRODUCTION PROGRAM**

Test and evaluate 10 small heavy duty buses in transit service.

PERFORMING AGENCY: Michigan Department of Transportation, MI-06-0032  
 INVESTIGATOR: Boctor, K Tel (412) 343-5533  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-21) Tel (202) 426-8483 Contract MI-06-0032  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: June 1982 COMPLETION DATE: June 1984  
 TOTAL FUNDS: \$106,000  
 ACKNOWLEDGMENT: UMTA

**11 385014****PARATRANSIT VEHICLE TECHNICAL SUPPORT**

Collect and evaluate data from existing taxicab operation in Pittsburgh and Miami and compare with data generated by the innovative paratransit vehicle being purchased under separate grants.

PERFORMING AGENCY: Dynatrend, Incorporated, UMTA-IT-06-0272  
 INVESTIGATOR: Connors, J Tel (703) 841-9800

SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-21) Tel (202) 426-8483 Contract UMTA-IT-06-0272  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Dec. 1981 COMPLETION DATE: July 1984  
 TOTAL FUNDS: \$170,000  
 ACKNOWLEDGMENT: UMTA

**11 385053**  
**NEW BUS EQUIPMENT INTRODUCTION PROGRAM**

Test and evaluate 10 heavy duty small buses.

PERFORMING AGENCY: Central Ohio Transit Authority, OH-06-0040  
 INVESTIGATOR: Fraser, S Tel (614) 275-5888  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-21) Tel (202) 426-8483 Contract OH-06-0040  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: June 1982 COMPLETION DATE: June 1984  
 TOTAL FUNDS: \$100,000  
 ACKNOWLEDGMENT: UMTA

**11 385058**  
**CONVERSION OF BUS TO OPERATE ON METHANOL FUEL**  
 This project will evaluate three 6V71 engines converted to the use of methanol. These engines will be installed in reconditioned GMC "New Look" coaches and operated for 6 months in revenue service in Jacksonville, Florida.

PERFORMING AGENCY: Florida Department of Transportation, FL-06-0022  
 INVESTIGATOR: Simmons, S Tel (904) 488-1587  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Sullivan, PJ (URT-22) Tel (202) 426-4035 Contract FL-06-0022  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1981 COMPLETION DATE: Dec. 1985  
 TOTAL FUNDS: \$3,000,000  
 ACKNOWLEDGMENT: UMTA

**11 385059**  
**EMERGENCY OFF WIRE TROLLEY BUS EVALUATION**  
 One year revenue service evaluation of 6 to 12 auxiliary power systems that will allow trolley bus to operate off wire. Paratransit Systems include battery, diesel/generation and gasoline/generator.

PERFORMING AGENCY: Miami Valley Regional Transit Authority, OH-06-0042  
 INVESTIGATOR: Broyles, M Tel (513) 226-1333  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Sullivan, PJ (URT-22) Tel (202) 426-4035 Contract OH-06-0042  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Jan. 1984  
 TOTAL FUNDS: \$144,000  
 ACKNOWLEDGMENT: UMTA

**11 385062**  
**FLYWHEEL ENERGY STORAGE SYSTEM**  
 The objective of this project is to develop a bus flywheel system that will provide all the benefits of an electric trolley bus and require only 15 percent of the overhead wires. The flywheel system will reduce operating and maintenance costs. The project includes the development and testing of flywheel energy storage systems, acquisition of test vehicle, installation of flywheel propulsion system, and field testing and evaluation at San Francisco MUNI. Reduction in overhead wiring by 85 percent will be a substantial capital savings for transit systems.

PERFORMING AGENCY: AiResearch Manufacturing Company, UMTA-CA-06-0168  
 INVESTIGATOR: Olmsted, D Tel (213) 512-4124  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Asatoorian, SD (URT-21) Tel (202) 426-8483 Contract UMTA-CA-06-0168  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: June 1984 COMPLETION DATE: Sept. 1985

TOTAL FUNDS: \$1,060,000  
 ACKNOWLEDGMENT: UMTA

**11 385063**  
**PARATRANSIT VEHICLE DEPLOYMENT EVALUATION**  
 Test and evaluate in taxicab service, sixteen innovative paratransit vehicles.

PERFORMING AGENCY: Port Authority of Allegheny County, PA-06-0064  
 INVESTIGATOR: Menniti, P Tel (412) 237-7335  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-21) Tel (202) 426-8483 Contract PA-06-0064  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Sept. 1981 COMPLETION DATE: June 1984  
 TOTAL FUNDS: \$682,000  
 ACKNOWLEDGMENT: UMTA

**11 385064**  
**SANTA BARBARA ELECTRIC VEHICLE PROJECT**  
 Design and track test of a prototype inductive coupling powered transit bus. This program will design the inground power transfer system, the vehicle propulsion system and the supporting ground facilities. A German "Vetters" bus will be used. One year tests at a non-public track are planned. This project will establish the feasibility of inductive coupling as a transit propulsion system.

PERFORMING AGENCY: Santa Barbara Metropolitan Transit District, CA-06-0177  
 INVESTIGATOR: Gleason, G Tel (805) 963-3364  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Sullivan, PJ (URT-22) Tel (202) 426-4035 Contract CA-06-0177  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Aug. 1982  
 TOTAL FUNDS: \$3,000,000  
 ACKNOWLEDGMENT: UMTA

**11 385065**  
**AIR CONDITIONING ACTIVITY**  
 This activity provides technical support to UMTA in the area of bus air conditioning system reliability improvement. It is to (1) document the AMG bus air conditioning system modifications designed and implemented by the transit agencies in Los Angeles and Miami; (2) provide contract monitoring for development and revenue of a rotary screw air conditioning compressor. These projects show the potential for solving a number of bus air conditioning reliability problems being experienced nationwide.

PERFORMING AGENCY: Transportation Systems Center, UMTA-MA-06-0120(A)  
 INVESTIGATOR: Perez, D Tel (617) 494-2490  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: DeMarco, VR (UFM-10) Contract UMTA-MA-06-0120(A) Tel (202) 426-4035  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Jan. 1983 COMPLETION DATE: Mar. 1984  
 ACKNOWLEDGMENT: UMTA

**11 385066**  
**BRAKE/RETARDER ACTIVITY**  
 This activity provides technical support to UMTA in improving brake and retarder subsystems on public transit buses. Industry contacts (operating, engineering and manufacturing) are maintained, problems identified, and modifications proposed for bus braking subsystems reviewed and evaluated. Involved are retarders, automatic adjusters, bonded linings, disc brakes, improved friction materials, and innovative modifications to GMC/Rockwell 3rd Generation Brake. All have potential for improving performance and reliability, and reducing costs.

PERFORMING AGENCY: Transportation Systems Center, UMTA-MA-06-0120(B)  
 INVESTIGATOR: Harrington, N Tel (617) 837-2654  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: DeMarco, VR (UFM-10) Contract UMTA-MA-06-0120(B) Tel (202) 426-4035  
 STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Jan. 1983 COMPLETION DATE: Apr. 1984  
ACKNOWLEDGMENT: UMTA

**11 385067****PROPULSION ACTIVITY**

This activity provides technical assistance to transit agencies in resolving problems with existing transit bus transmissions and to evaluate improved products in revenue service. There will be an update of initial reliability evaluation of the GM V730 transmission to monitor the reliability and performance improvements associated with the UEC version of the V730. An objective assessment of propulsion technology will balance opinions of the supplier and customer.

PERFORMING AGENCY: Transportation Systems Center, UMTA-MA-06-0120(C)

INVESTIGATOR: Seekell, F Tel (617) 494-2024

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: DeMarco, VR (UFM-10) Contract UMTA-MA-06-0120(C) Tel (202) 426-4035

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Nov. 1982 COMPLETION DATE: Sept. 1984

ACKNOWLEDGMENT: UMTA

**11 385071****ADVANCED PROPULSION ALTERNATIVE ANALYSIS**

This activity is to establish technology development and demonstration plans in transit bus propulsion for the next 15 years. Participants will be identified. The technology and transit bus services likely to be available in the future are identified. Market and cost studies will be performed to match the best technologies and types of service. Recommendations will be made for appropriate activities for propulsion systems in the near future.

PERFORMING AGENCY: Transportation Systems Center, UMTA-MA-06-0120(K)

INVESTIGATOR: Gunderson, D Tel (617) 494-2654

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Sullivan, PJ (URT-21) Tel (202) 426-8483 Contract UMTA-Ma-06-0120(K)

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: May 1984 COMPLETION DATE: Mar. 1985

TOTAL FUNDS: \$406,000

ACKNOWLEDGMENT: UMTA

**11 385072****TECHNICAL SUPPORT FOR INDUSTRY ANALYSIS**

Projects and approaches for development and demonstration in equipment subsystems will be identified. Studies and analyses will identify transit bus industry problems and potential solutions.

PERFORMING AGENCY: Transportation Systems Center, UMTA-MA-06-0120(L)

INVESTIGATOR: Comparato, T Tel (617) 837-2196

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Lopez, RA (URT-21) Contract UMTA-MA-06-0120(L) Tel (202) 426-8483

STATUS: Active NOTICE DATE: Apr. 1984

ACKNOWLEDGMENT: UMTA

**11 385073****TECHNICAL SUPPORT FOR EQUIPMENT APPLICATIONS**

This project provides technical support to UMTA URT-20 in the area of equipment applications. Critical engineering analysis is made on demonstration projects involving air conditioning, transmissions, engines and braking systems.

PERFORMING AGENCY: Transportation Systems Center, UMTA-MA-06-0120(P)

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: DeMarco, VR (UFM-10) Contract UMTA-MA-06-0120(P) Tel (202) 426-4035

STATUS: Active NOTICE DATE: Apr. 1984

TOTAL FUNDS: \$300,000

ACKNOWLEDGMENT: UMTA

**11 385074****TECHNICAL SUPPORT**

This activity provides technical support to UMTA bus and paratransit vehicle systems projects. Involved are tests on rotary screw air conditioning compressors, techniques for increasing brake lining life, evaluation of UEC-730 transmission with electronic control, electronic fare boxes and passenger counter mats, fuel economy data for life cycle costs, and value engineering for bus maintenance facilities. Technical experts in a number of critical engineering disciplines support UMTA efforts to provide assistance to transit operating agencies in solving operating problems or reducing operating costs.

PERFORMING AGENCY: Transportation Systems Center, UMTA-MA-06-0120(T)

INVESTIGATOR: Comparato, T Tel (617) 837-2196

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: DeMarco, VR (UFM-10) Contract UMTA-MA-06-0120(T) Tel (202) 426-4035

STATUS: Active NOTICE DATE: Apr. 1984

TOTAL FUNDS: \$4,494,000

ACKNOWLEDGMENT: UMTA

**11 385075****DUAL MODE BUS**

Operational data will be obtained on the performance of dual propulsion bus in transit service. This will involve test and evaluation of a battery bus with a diesel engine installed which will extend the operation range and allow for some route deviation in transit service. Bus will be used primarily in the Transitway Mall.

PERFORMING AGENCY: Regional Transportation District, UMTA-CO-03-3002

INVESTIGATOR:

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-22) Tel (202) 426-4035 Contract UMTA-CO-03-3002

STATUS: Active NOTICE DATE: Apr. 1984

ACKNOWLEDGMENT: UMTA

**11 385076****TROLLEY BUS CONTROLLER EVALUATION**

Comparative performance and potential cost benefits will be established for new AC induction and DC chopper trolley bus controllers compared to existing cam controllers. One month non-revenue service evaluation will be made for each of the three different types of controllers (4 makes to be tested) over typical MUNI routes. Preparation of receptivity study and final report. Little data is available on DC & AC controllers. They are expected to reduce operation and maintenance costs, and to improve electricity consumption by 20%.

PERFORMING AGENCY: San Francisco Public Utilities Commission, UMTA-CA-06-0147

INVESTIGATOR: Johnson, J Tel (415) 558-5660

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Sullivan, PJ (URT-21) Tel (202) 426-8483 Contract UMTA-CA-06-0147

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Nov. 1983 COMPLETION DATE: Sept. 1984

TOTAL FUNDS: \$662,000

ACKNOWLEDGMENT: UMTA

**11 385077****TECHNICAL SUPPORT**

Adequate liaison will be achieved with the transit operating industry to ensure that the UMTA Bus and Paratransit Technology projects will serve the needs of the transit industry. The APTA Bus Technology Liaison board will review UMTA's projects and provide technical guidance and coordination between UMTA and the transit industry. APTA will provide assistance in implementing new and improved technology into the industry.

PERFORMING AGENCY: American Public Transit Association, UMTA-DC-06-0410

INVESTIGATOR: Cihak, F Tel (202) 828-2888

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: DeMarco, VR (UFM-10) Contract UMTA-DC-06-0410 Tel (202) 426-4035



STATUS: Active NOTICE DATE: Apr. 1984  
 ACKNOWLEDGMENT: UMTA

**11 385079**  
**PARATRANSIT VEHICLE OPERATOR SUPPORT AND EVALUATION**

The objective is to stimulate manufacturers to build vehicles which meet the special requirements of low capacity paratransit service at an affordable price without federal capital assistance. Data from the in service tests in Pittsburgh and Miami will be evaluated for innovative paratransit vehicles.

PERFORMING AGENCY: Dynatrend, Incorporated, UMTA-IT-06-0272  
 INVESTIGATOR: Connors Tel (703) 841-9800  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-22) Tel (202) 426-4035 Contract UMTA-IT-06-0272  
 STATUS: Active NOTICE DATE: Apr. 1984  
 TOTAL FUNDS: \$170,000  
 ACKNOWLEDGMENT: UMTA

**11 385080**  
**STANDARD BUSES, INLINE ENGINE/TRANSMISSION**

Ten standard transit buses featuring in-line drivetrain and roof-top air conditioning units will be tested and evaluated to assess cost, performance and passenger accessibility characteristics, determining the effect of the features on fuel efficiency, reliability and costs. The information will be disseminated to the transit industry for future purchasing decisions.

PERFORMING AGENCY: Maryland Department of Transportation, UMTA-MD-06-0105  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-22) Tel (202) 426-8483 Contract UMTA-MD-06-0105  
 STATUS: Active NOTICE DATE: Apr. 1984  
 ACKNOWLEDGMENT: UMTA

**11 385081**  
**DATA COLLECTION/ANALYSIS ON V730 TRANSMISSION**

Investigate and evaluate techniques to improve reliability of V730 bus transmission with electronic control which improves fuel economy and lowers maintenance costs. Develop and implement life cycle cost and bus component reliability data. Three transit properties with Detroit Diesel Allison transmissions are involved in this program (San Diego, Indianapolis, and Worcester, MA.). Electronic controlled transmission may increase fuel economy by 7-9% and lower maintenance costs. Results from tests by operators will establish performance and cost benefits of electronic transmission. Microcomputers have been installed in three transit agencies, fuel and transmission maintenance data is now being collected.

PERFORMING AGENCY: San Diego Transit Corporation, UMTA-CA-06-0179  
 INVESTIGATOR: Holley, J Tel (619) 238-0100  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: DeMarco, VR (UFM-10) Contract UMTA-CA-06-0179 Tel (202) 426-4035  
 STATUS: Active NOTICE DATE: Apr. 1984  
 ACKNOWLEDGMENT: UMTA

**11 385082**  
**MIDSIZE BUSES**

Thirty midsize buses to be tested feature engine-compartment cooling system, constant-speed-drive air-conditioning compressor, and engine compartment fire extinguisher. The cost, performance and passenger accessibility will be assessed, and the effect of these features on fuel efficiency and reliability will be determined. Information will be disseminated to the transit industry for future purchasing decisions.

PERFORMING AGENCY: Metropolitan Transit Authority of Harris County, UMTA-TX-06-0044  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-22) Tel (202) 426-8483 Contract UMTA-TX-06-0044  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: May 1984  
 ACKNOWLEDGMENT: UMTA

**11 385083**  
**ARTICULATED BUSES, 2 AXLE DRIVE**

Test and evaluate bus design features including low flat floor, wide doors, 2-axle drive and gearbox retarder on 10 articulated buses to assess cost, performance and passenger accessibility. The tests are to determine effect of features on fuel efficiency, reliability and costs. Data collected will be disseminated to transit industry for future purchasing decisions

PERFORMING AGENCY: New Orleans Public Service, Incorporated, UMTA-LA-06-0005  
 INVESTIGATOR: Barns Tel (504) 569-2600  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-22) Tel (202) 426-4035 Contract UMTA-LA-06-0005  
 STATUS: Active NOTICE DATE: Apr. 1984  
 ACKNOWLEDGMENT: UMTA

**11 385084**  
**STORED HYDRAULIC ENERGY PROPULSION SYSTEM**

Determination of the operational, performance and cost benefits of a prototype hydraulic accumulator energy propulsion system. There will be non-revenue service evaluation of a Danish Stored Hydraulic Energy Propulsion System (SHEPS) in Portland and at two other sites. It is expected that stored hydraulic energy propulsion systems will improve fuel economy by 35% and reduce brake wear. System is to pay for itself in 3 years

PERFORMING AGENCY: Tri-Met Transportation District of Oregon, UMTA-OR-06-0007  
 INVESTIGATOR: Newhouse, T  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Sullivan, PJ (URT-21) Tel (202) 426-8483 Contract UMTA-OR-06-0007  
 STATUS: Active NOTICE DATE: Apr. 1984  
 TOTAL FUNDS: \$300,000  
 ACKNOWLEDGMENT: UMTA

**11 385086**  
**METHANOL CONVERSION—COLD WEATHER SUPPORT**

This test will ensure that the engine modification developed by Florida DOT for combustion of methanol in bus engines has application to cold weather sites. Technical assistance will be provided to UMTA through attendance at design review meetings and preparation of technical reports. A significant amount of funding is committed to the Florida project. This effort will ensure that the modification work has application to all buses nationwide.

PERFORMING AGENCY: Lowell Regional Transit Authority, UMTA-MA-06-0136  
 INVESTIGATOR: Potzka, J Tel (617) 459-0164  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Sullivan, PJ (URT-21) Tel (202) 426-8483 Contract UMTA-MA-06-0136  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Feb. 1983 COMPLETION DATE: May 1985  
 TOTAL FUNDS: \$15,000  
 ACKNOWLEDGMENT: UMTA

**11 385087**  
**INDUCTIVE COUPLING ALTERNATIVE ANALYSIS**

Inductive coupling will be considered in determining the most operationally acceptable and cost effective means of providing electric bus service on existing MBTA trolley bus lines. A detailed alternatives analysis will be made of inductively coupled electric propulsion systems as a means of replacing trolley bus service in Cambridge. Analysis may consider battery buses, fuel cells, inductive coupling, flywheels and hybrid vehicles.

PERFORMING AGENCY: Massachusetts Bay Transportation Authority, UMTA-MA-06-0000  
 INVESTIGATOR: Nasick, M Tel (617) 722-5919  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Sullivan, PJ (URT-21) Tel (202) 426-8483 Contract UMTA-MA-06-0000  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Apr. 1984  
 ACKNOWLEDGMENT: UMTA

**11 385090****DUAL MODE TROLLEY BUS**

To obtain operational data on the performance of dual-propulsion trolley buses in transit service, test and evaluate 20 trolley buses with gasoline engines will be tested. This will permit vehicles to travel off-wire and provide transit service to extended areas.

PERFORMING AGENCY: San Francisco Public Utilities Commission, UMTA-CA-03

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-22) Tel (202) 426-4035 Contract UMTA-CA-03

STATUS: Active NOTICE DATE: Apr. 1984

ACKNOWLEDGMENT: UMTA

**11 385091****DUAL PROPULSION TROLLEY COACH**

Establish the operational and cost benefits of utilizing a trolley/diesel bus capable of performing beyond the limits of the overhead wires. Disseminate information to transit agencies for their use in future procurements. This will involve evaluation of an articulated-trolley/diesel bus in revenue service. The diesel engine provides off-wire capability for route extensions. Renault ER-100 will be tested at Seattle.

PERFORMING AGENCY: Municipality of Metropolitan Seattle-METRO, UMTA-WA-06-0020

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-22) Tel (202) 426-4035 Contract UMTA-WA-06-0020

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Jan. 1983 COMPLETION DATE: Apr. 1984

TOTAL FUNDS: \$228,000

ACKNOWLEDGMENT: UMTA

**11 385092****SMALL ACCESSIBLE BUSES**

This study is to assist in the evaluation of small buses with innovative features and to disseminate this information to the transit industry. There will be a test and evaluation of bus wheelchair accessibility features to assess cost and performance, and to determine effect of features on fuel efficiency, reliability, and costs. Vehicle must also negotiate 10% grade at 35 miles per hour. 2 small buses to be tested. NBEI project will provide collection of unbiased performance data to be used to determine cost/benefits of equipment. Results obtained can be used by operator to determine extent for new equipment to benefit operation.

PERFORMING AGENCY: South Coast Area Transit, UMTA-CA-06-0190

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-22) Tel (202) 426-4035 Contract UMTA-CA-06-0190

STATUS: Active NOTICE DATE: Apr. 1984

ACKNOWLEDGMENT: UMTA

**11 385094****SMALL BUSES, LOW FLOOR**

This activity will involve test, demonstration and evaluation of six small diesel buses with low floors and manually operated wheelchair ramps to determine effect of these features on fuel efficiency, reliability, costs, performance and passenger accessibility. The results will assist grantee in evaluation of buses and information will be disseminated to the transit industry for future purchasing decisions.

PERFORMING AGENCY: Lincoln Transportation System

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-22) Tel (202) 426-8483 Contract UMTA-NB-06-0005

STATUS: Active NOTICE DATE: Apr. 1984

ACKNOWLEDGMENT: UMTA

**11 385095****TECHNICAL SUPPORT**

To provide continuing technical support on an as-needed basis to the Office of Bus and Paratransit Systems in implementing its programs by examining, evaluating, analyzing and reporting upon issues identified by the Office.

PERFORMING AGENCY: Battelle Columbus Laboratories, UMTA-IT-06-0219(B)

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Lopez, RA (URT-21) Contract UMTA-IT-06-0219(B) Tel (202) 426-8483

STATUS: Active NOTICE DATE: Apr. 1984

TOTAL FUNDS: \$143,000

ACKNOWLEDGMENT: UMTA

**11 385096****TECHNICAL SUPPORT NBEI PROGRAM**

To supply technical assistance to assure that new bus equipment is tested and evaluated in a technically competent manner, providing input to transit properties on procurements of New Bus Equipment.

PERFORMING AGENCY: Battelle Columbus Laboratories

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-22) Tel (202) 426-4035 Contract UMTA-IT-06-0219(C)

STATUS: Active NOTICE DATE: Apr. 1984

TOTAL FUNDS: \$228,000

ACKNOWLEDGMENT: UMTA

**11 385097****APTA—O & M DATA COLLECTION**

This activity is to identify problem areas for investigation by monitoring transit operating agencies' experiences with transit buses to identify trouble-prone subsystems and components requiring additional study. Components which require excessive or costly maintenance and repair should be targeted for URT-20 research efforts.

PERFORMING AGENCY: American Public Transit Association, UMTA-DC-06-0364

INVESTIGATOR: Jones, P Tel (202) 828-2880

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Lopez, RA (URT-21) Contract UMTA-DC-06-0364 Tel (202) 426-8483

STATUS: Active NOTICE DATE: Apr. 1984

TOTAL FUNDS: \$50,000

ACKNOWLEDGMENT: UMTA

**11 385098****TECHNICAL SUPPORT FOR BUS & PARATRANSIT SYSTEMS**

This activity will provide technical support for the Office of Bus & Paratransit Systems by conducting studies and analyses of bus technology, including test and evaluation of components, subsystems and vehicles. The contractor will also store and safeguard equipment and vehicles, develop test plans and procedures, document and disseminate test results, and conduct studies as required.

Performing agency to be selected.

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Lopez, RA (URT-21) Contract UMTA-IT-06-0322(T) Tel (202) 426-8483

STATUS: Active NOTICE DATE: Apr. 1984

TOTAL FUNDS: \$1,255,000

ACKNOWLEDGMENT: UMTA

**11 385100****TECHNOLOGY BRIEFS**

To provide the transit industry with information on URT-20 technical assistance activities, technical briefs will be issued to a broad audience to disseminate technical information.

PERFORMING AGENCY: Public Technology, Incorporated, UMTA-DC-06-0444

INVESTIGATOR: Page, E Tel (202) 626-2467

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Lopez, RA (URT-21) Contract UMTA-DC-06-0444 Tel (202) 426-8483

STATUS: Active NOTICE DATE: Apr. 1984

TOTAL FUNDS: \$274,500

ACKNOWLEDGMENT: UMTA

**11 385101**

**SEATTLE GUIDED BUS**

Establish the effectiveness of fixed guideway technology in reducing busways as operationally acceptable means of providing high density transit services. Evaluate competitive fixed guideway technologies. Make a preliminary design of a test guideway system. Select site and prepare an environmental assessment for revenue service evaluation. Busways that are constructed with means for vehicle lateral guidance built into them are narrower than those that do not. Studies performed in Germany indicate that up to 30% can be saved in the construction costs of tunnels.

PERFORMING AGENCY: Municipality of Metropolitan Seattle-METRO, UMTA-WA-06-0023

INVESTIGATOR: Montgelas, R Tel (206) 447-6714

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: DeMarco, Vr (UFM-10) Contract UMTA-WA-06-0023 Tel (202) 426-4035

STATUS: Active NOTICE DATE: Apr. 1984

TOTAL FUNDS: \$130,000

**11 385102**

**PARATRANSIT VEHICLE TEST AND EVALUATION**

To obtain operational data and other information on use of innovative vehicles operated in paratransit service, 10 such units will be purchased, tested and evaluated by private operators with the results disseminated to operators and equipment manufacturers. This funding will reduce the initial cost for transportation providers in testing innovative, improved paratransit vehicles.

PERFORMING AGENCY: Port Authority of Allegheny County, UMTA-PA-06-0064

INVESTIGATOR: Menniti Tel (412) 237-7335

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-22) Tel (202) 426-4035 Contract UMTA-PA-06-0064

STATUS: Active NOTICE DATE: Apr. 1984

TOTAL FUNDS: \$682,000

ACKNOWLEDGMENT: UMTA

**11 385103**

**PARATRANSIT VEHICLE TEST AND EVALUATION**

To obtain operational data and other information on use of innovative vehicles operated in paratransit service, 10 such units will be purchased, tested and evaluated by private operators with the results disseminated to operators and equipment manufacturers. This funding will reduce the initial cost for transportation providers in testing innovative, improved paratransit vehicles.

PERFORMING AGENCY: Florida Department of Transportation, UMTA-FL-06-0029

INVESTIGATOR: Duffy Tel (904) 488-7390

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-22) Tel (202) 426-4035 Contract UMTA-FL-06-0029

STATUS: Active NOTICE DATE: Apr. 1984

TOTAL FUNDS: \$500,000

ACKNOWLEDGMENT: UMTA

**11 385107**

**FUEL CELL FEASIBILITY STUDY—TECHNICAL STUDY**

This activity is to establish the technical, operational and cost feasibility of fuel cells for transit bus propulsion. There will be a market study and preparation of a plan for demonstration of fuel-cell powered buses. Fuel cells are accepted environmentally. The study will establish their feasibility in comparison with other technologies.

PERFORMING AGENCY: Department of Energy, UMTA-NM-06-0004

INVESTIGATOR: Maestas, G Tel (505) 667-1372

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Sullivan, PJ (URT-21) Tel (202) 426-8483 Contract UMTA-NM-06-0004

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Apr. 1984 COMPLETION DATE: Apr. 1985

TOTAL FUNDS: \$290,000

ACKNOWLEDGMENT: UMTA

**11 385108**

**DOUBLE DECKER BUS EVALUATION—3(A)(1)(C)**

This activity will test and evaluate a 4-axle double decker bus to obtain operational data on its performance in transit service. Information can be used by transit properties for future vehicle purchasing decisions.

PERFORMING AGENCY: Denver Regional Transportation District, UMTA-CO-03-3001

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Ridgley, JE (URT-22) Tel (202) 426-8483 Contract UMTA-CO-03-3001

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Apr. 1984 COMPLETION DATE: June 1985

ACKNOWLEDGMENT: UMTA

**11 385109**

**ROTARY SCREW COMPRESSOR**

This activity will test and evaluate rotary screw air conditioning compressors as replacements for the original reciprocating units. Air conditioning on WMATA buses has proven chronically unreliable and costly to maintain. The rotary units offer a promise of lower costs, easier maintenance, increased efficiency and greater reliability.

PERFORMING AGENCY: Washington Metropolitan Area Transit Authority, UMTA-DC-06-0469

INVESTIGATOR: Coddling, R Tel (202) 637-1209

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483 Contract UMTA-DC-06-0469

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: July 1983 COMPLETION DATE: Sept. 1984

TOTAL FUNDS: \$40,000

ACKNOWLEDGMENT: UMTA

**11 385110**

**ROTARY SCREW COMPRESSOR**

This activity will test and evaluate rotary screw air conditioning compressors as replacements for the original reciprocating units. Air conditioning on SEPTA buses has proven chronically unreliable and costly to maintain. The rotary unit offers a promise of lower costs, easier maintenance, increased efficiency and greater reliability.

PERFORMING AGENCY: Southeastern Pennsylvania Transportation Authority, UMTA-PA-06-0086

INVESTIGATOR: Verneyc Tel (215) 456-4659

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483 Contract UMTA-PA-06-0086

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Apr. 1984 COMPLETION DATE: Nov. 1984

TOTAL FUNDS: \$60,000

ACKNOWLEDGMENT: UMTA

12 372975

**BUS COMMUNICATIONS SYSTEMS**

Prior syntheses covered motorist aid systems, telecommunications systems for highway administration, and the radio spectrum frequency. The proposed synthesis would include related updated portions of all of the above, plus the only available area of the frequency spectrum (800-900 Mhz) where large number of channels are available on a private channel basis for mass transit communications. The synthesis would cover a survey of at least ten transit properties for detailed information on their voice data communication system—the equipment, personnel training, design, cost, source of funds, installation, maintenance, problems, effectiveness, benefits, and unique features or applications. Additionally, the manufacturers would be surveyed to determine what systems are presently available and their cost. Reports exist on other aspects of transit management and communication system peripherals. There are no reports on what communication systems have been installed on transit properties and what communication systems and their alternative features are presently available.

PERFORMING AGENCY: Mitre Corporation  
 INVESTIGATOR: Klopfenstein, RC Tel (703) 883-6824  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Copas, T Tel (202) 334-3242 NCTRP 60-1, TS-7  
 STATUS: Active NOTICE DATE: May 1984  
 START DATE: Nov. 1983 COMPLETION DATE: Oct. 1984  
 TOTAL FUNDS: \$45,000  
 ACKNOWLEDGMENT: National Cooperative Transit Res & Devel Program

12 384953

**AUTOMATIC PASSENGER COUNTERS AND BUS LOCATION**

To increase reliability and reduce operating and maintenance costs of obtaining automated passenger counter (APC) data, this activity will install a digital data link between APC system and bus radio so that daily patronage data may be transmitted to the bus depot. A portable data storage device will be tested. Also to be investigated are sign posts and

odometer readings as a basis for bus location. The patronage data is needed for UMTA Section 15 reporting and for proper scheduling.

PERFORMING AGENCY: METRO/Seattle, UMTA-WA-06-0025  
 INVESTIGATOR: Friedman, T Tel (206) 447-6399  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483

STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: 1983 COMPLETION DATE: Oct. 1985  
 ACKNOWLEDGMENT: UMTA

12 385032

**PHILADELPHIA SIGNAL PREEMPTION**

This demonstration will apply traffic signal preemption and programming technology to a surface electric trolleybus route, Route 66, operating along Frankford Avenue in northeastern Philadelphia. The techniques will be applied to both local and express service. Also included in this demonstration are 1) extension of the express zone and installation of additional power wires to permit simultaneous bi-directional express operation; and 2) circulation improvements at the southern terminus of the route. The project began October 1979 and was originally scheduled to end in October 1983. Due to delays in start-up of service, the demonstration period has been extended.

PERFORMING AGENCY: Multisystems, Incorporated, UMTA-MA-06-0049 UMTA-PA-06-0053; Southeastern Pennsylvania Transportation Authority  
 INVESTIGATOR: Englisher, L Tel (617) 864-5810  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Goodman, JM (URT-31) Tel (202) 426-4984 Contract UMTA-PA-06-0053  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Sept. 1979 COMPLETION DATE: July 1984  
 TOTAL FUNDS: \$1,028,080  
 ACKNOWLEDGMENT: UMTA

13 348803

**ELECTROMAGNETIC COMPATIBILITY/ELECTRIC TRANSMISSION LINES AND RAILWAY COMMUNICATIONS AND SIGNALS**

The compatibility between railroad communications and signal systems and utility AC transmission lines will be investigated. Existing methods for calculating effects and mitigating problems will be investigated during the first year. Phase II, 14 months, will concentrate on field measurement of the susceptibility of railroad C&S equipment and verification of the predictive and mitigation techniques developed in Phase I. Two experiments are planned on rights of way jointly occupied by railroads and high-voltage AC transmission lines. Tests will include shielded cables and fiberoptic links.

PERFORMING AGENCY: IIT Research Institute  
 SPONSORING AGENCY: Electric Power Research Institute  
 RESPONSIBLE INDIVIDUAL: Dunlap, J

STATUS: Completed NOTICE DATE: Apr. 1984  
 START DATE: 1981

13 348986

**TRANSPORTATION SYSTEMS CENTER TESTS RAIL CAR WHEELS TO CUT NOISE**

Under the sponsorship of UMTA, the Transportation Systems Center is directing an effort to evaluate the effectiveness of four types of transit car wheels designed with damping treatments to eliminate the high-pitched sound produced as trains negotiate tight curves. The four wheel designs (constrained-layer damping, tuned-damping, and two types of ring damping) will be installed on a 10-car train which will consist of four pairs of cars, each pair equipped with one of the four designs, and a control pair with untreated wheels. Evaluation during revenue service by NYCTA, beginning in spring 1982, will continue for one year. The designs to be evaluated are not currently in use in the U.S. or Canada.

PERFORMING AGENCY: Transportation Systems Center; Cambridge Collaborative, Incorporated; New York City Transit Authority  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Mason, R Tel (617) 494-2574 Contract  
 STATUS: Active NOTICE DATE: May 1982  
 START DATE: 1982 COMPLETION DATE: 1983

13 349145

**DETECTION OF LOW-LEVEL FAULT CURRENTS ON RAIL TRANSIT SYSTEMS**

The objective of this research is to identify and evaluate methods and equipment for detection of low-level electrical faults on direct-current rail transit systems. Although devices currently in use can adequately detect and respond to overload fault currents, detection of less than overload fault currents is difficult because the fault current characteristics tend to resemble those normally associated with train or power switching operations. Surveys will be conducted world-wide of rail transit systems and electrical industry organizations and suppliers to identify methods and equipment currently in use and potential solutions. The final report will include a detailed evaluation of the performance and economics of available methods and equipment.

Report in preparation.

PERFORMING AGENCY: Main (Charles T), Incorporated  
 INVESTIGATOR: Sagar NS Tel (617) 262-3200  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Smith, HA Tel (202) 334-3224  
 NCTRP 43-1  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Jan. 1983 COMPLETION DATE: Apr. 1984  
 TOTAL FUNDS: \$99,953  
 ACKNOWLEDGMENT: National Cooperative Transit Res and Dev Program

13 362089

**AC PROPULSION SYSTEM DEVELOPMENT PROJECT, PHASE I**

An alternating-current propulsion system for on-board installation on heavy rail transit cars is to be developed and laboratory tested. The project is supported by New York City Transit Authority which serves as the host property.

Westinghouse Electric Company is the co-manufacturer working with Garrett.

PERFORMING AGENCY: Garrett Corporation  
 SPONSORING AGENCY: Urban Mass Transportation Administration

STATUS: Active NOTICE DATE: Dec. 1982  
 START DATE: 1982 COMPLETION DATE: 1983

13 385024

**MAINTENANCE/DIAGNOSTIC TRAINLINE MULTIPLEXING SYSTEM**

Objectives: Multiplex trainline signals, record data on out-of-tolerance equipment in solid-state, microcontrolled memory, and reduce electrical connections on vehicles couplers. Scope: Project results will improve diagnostics and maintenance planning. Will develop criteria to design prototype systems for revenue test and evaluation. Potentially can benefit many other transit systems.

PERFORMING AGENCY: Washington Metropolitan Area Transit Authority, DC-06-0443  
 INVESTIGATOR: Vogel, E Tel (202) 637-1107 Scarbrough, R Tel (202) 637-1105  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Sing, FL (URT-12) Tel (202) 426-9264 Contract UMTA-DC-06-0443  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: June 1983 COMPLETION DATE: Aug. 1984  
 TOTAL FUNDS: \$190,000  
 ACKNOWLEDGMENT: UMTA

13 385039

**AC PROPULSION PROJECT**

Life cycle cost studies of AC propulsion compared to conventional DC propulsion systems.

REFERENCES:  
 NYCTA R44 Car, Cam Controlled Propulsion System, Cost and Reliability Data Base, Berger, KW, Dec. 1983

PERFORMING AGENCY: Lea (ND) and Associates, Incorporated, IT-06-0253  
 INVESTIGATOR: Berger, K Tel (703) 471-4007  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Hoyle, RC (URT-12) Tel (202) 426-0090 Contract 60-82-C-72143  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Mar. 1982 COMPLETION DATE: Jan. 1986  
 TOTAL FUNDS: \$291,000  
 ACKNOWLEDGMENT: UMTA

13 385051

**AC PROPULSION PROJECT**

Design, build and test ac propulsion for urban rail transit vehicle. Install on two NYCTA R-44 vehicles and test at Pueblo Test Track and on NYCTA. Complete reliability, maintainability, safety, life cycle cost and signal system compatibility studies. Submit reports at completion of program. Objective is to demonstrate features of ac propulsion to US transit industry.

PERFORMING AGENCY: Garrett Airesearch Corporation  
 INVESTIGATOR: Kalman, G Tel (213) 512-4087  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Kangas, RD (URT-12) Tel (202) 426-2896 Contract DTUM60-82-C-71144  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Mar. 1982 COMPLETION DATE: Sept. 1986  
 TOTAL FUNDS: \$4,534  
 ACKNOWLEDGMENT: UMTA

13 385056

**AC PROPULSION PROJECT**

Design, build and test ac propulsion system for urban rail transit vehicle. Complete laboratory system tests, reliability, maintainability and safety studies, and life cycle cost studies. Conduct investigation of compatibility with signal and control systems. Submit design and study reports to UMTA at completion of program.

PERFORMING AGENCY: Westinghouse Electric Corporation

INVESTIGATOR: Luley, RP Tel (412) 464-4836  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Kangas, RD (URT-12) Tel (202) 426-  
2896 Contract DTUM60-82-C-71145

STATUS: Active NOTICE DATE: Apr. 1984  
START DATE: Mar. 1983 COMPLETION DATE: Sept. 1984  
ACKNOWLEDGMENT: UMTA

14 372979

## SINGLE CABLE COMMUNICATIONS TECHNOLOGY FOR RAIL-TRANSIT SYSTEMS, TASKS 1, 2, 3

The typical rapid transit system, especially one which has significant underground right-of-way, uses a large number of cables for the transmission of voice, data, and video information. The objective of this research is to develop recommended system-design parameters which permit utilization of a single, multi-purpose wideband coaxial cable to support all rapid transit communications requirements including: voice, data, and video, as well as VHF or UHF-FM two-way radio signals. To accomplish the objective of this research, the following tasks are proposed: Task 1-Perform an indepth survey of US rapid-transit systems under the auspices of APTA to determine how the problem is handled on each system. Concurrently, survey the electronic industry for developments which are potential solutions. Review the work of other industries which may be relevant to the problem and its solution. Task 2-Using information obtained in Task 1, identify the electrical-system parameters of the proposed research program. Generate a range of electrical characteristics that will define the scope of the single cable system and several distinct network configurations. Task 3-establish functional criteria for a single-cable system. Task 4-Distribute the criteria derived in Task 3 to appropriate organizations to request their response for participation in the development of technical or operational solutions to the problem. Select one or two for further physical development. Task 5-Evaluate the work underway by the chosen developers. Monitor the direction of research and development against the specific functional goals of the program as developed in Task 3. At suitable times, field test prototype systems or equipment on existing transit properties to assure adherence to program objectives. Task 6-Prepare a final report describing the research and its results. Describe the single cable system in sufficient detail so that further refinement, enhancements, and packaging of components could be done by others.

PERFORMING AGENCY: Polytechnic Institute of New York

INVESTIGATOR: Cassara, FA Tel (516) 454-5075

SPONSORING AGENCY: Urban Mass Transportation Administration NCTRP 46-1

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Apr 1984 COMPLETION DATE: Feb 1985

TOTAL FUNDS: \$100,000

ACKNOWLEDGMENT: National Cooperative Transit Res & Devel Program

14 385008

## ELECTROMAGNETIC INTERFERENCE (EMI) MEASURING EQUIPMENT FOR AGRT PROGRAM

The objective of this program is to provide specialized EMI test instrumentation in a mobile van for use in EMI testing at different geographical locations. Purchase and modify a van so it is capable of safely transporting the sensitive test instrumentation to various locations; purchase specified EMI test equipment and install in the van; install a power distribution system in the van for the test equipment and provide and install other auxiliary equipment in the van; and test the finish van to ensure the integrity of the vehicle and the instrumentation.

PERFORMING AGENCY: Mobility Systems and Equipment Company, UMTA-CA-06-0186

INVESTIGATOR: Adams, G Tel (213) 641-3606

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Sing, FL (URT-12) Tel (202) 426-0090 Contract DTUM60-83-C-71220

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Oct. 1983 COMPLETION DATE: Apr. 1984

ACKNOWLEDGMENT: UMTA

15 138532

**CONSTRUCTION TECHNOLOGY**

The results of the Urban Rail Construction Technology program will assist policy makers and the transit industry in evaluating construction alternatives which show areas of cost savings, safety enhancement and increased performance and reliability. The primary goal of the program is to bring about significant reduction in construction cost of urban rail transit system facilities by implementing new technologies and by improving design, construction and contracting practices in the urban rail transit construction industry. The four major thrusts of the program are underground, at-grade track and wayside, elevated structures and contracting and management.

PERFORMING AGENCY: Urban Mass Transportation Administration;  
Transportation Systems Center  
SPONSORING AGENCY: Urban Mass Transportation Administration

STATUS: Active NOTICE DATE: Aug. 1980  
START DATE: 1973 COMPLETION DATE: 1985  
TOTAL FUNDS: \$30,000,000  
ACKNOWLEDGMENT: UMTA

15 362087

**MAINTENANCE & REHABILITATION NEEDS OF URBAN TRANSIT ELEVATED STRUCTURES**

The 175 miles of elevated transit structures in the U.S. are the object of a research effort addressing maintenance and rehabilitation needs. The project will also look at inspection procedures for elevated structures, stations and bridges. Current technologies, and procedures, costs and problem areas involved will also be considered.

PERFORMING AGENCY: Transportation Systems Center  
SPONSORING AGENCY: Urban Mass Transportation Administration

STATUS: Active NOTICE DATE: Dec. 1982  
START DATE: 1982

15 362088

**EVALUATION OF THE COLOGNE EGG**

A resilient rail fastener known as the Cologne Egg will be evaluated. The fastener, first tested on the Cologne subway system, features an elliptical elastomer collar bonded between two steel members and is reported to reduce groundborne vibrations effectively and economically. Fasteners are installed on a section of track on the Orange Line subway. Vibration damping and maintainability characteristics will be compared with those of conventional fasteners under in-service conditions for an extended period.

MBTA will be assisted in planning the project by Kaiser Engineers, Fay Spofford and Thorndike, Inc., a joint venture group in Boston responsible for the Southwest Corridor Project. Acoustical design of the tests will be performed by Bolt Beranek and Newman, Inc., of Cambridge, Ma.

PERFORMING AGENCY: Massachusetts Bay Transportation Authority  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Dining, M Transportation Systems  
Center Tel (617) 494-2119

STATUS: Active NOTICE DATE: Dec. 1982  
START DATE: 1982 COMPLETION DATE: 1983  
TOTAL FUNDS: \$250,000

15 385027

**NONDESTRUCTIVE TESTING**

The project objective is to develop a nondestructive testing device to be used in the early identification of potential tunnel liner cracks or defects. Several older transit authorities experience water intrusion problems in their tunnels as liner cracks with no warning. This technique or device will permit the forecasting of such problem areas, consequently allowing maintenance crews and rehabilitation plans to be scheduled in an orderly and cost-effective manner.

PERFORMING AGENCY: New York City Transit Authority, UMTA-  
NY-06-0078; Port Authority Trans-Hudson Corporation  
INVESTIGATOR: Haid, W Tel (212) 466-7672

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Evoy, HD (URT-11) Tel (202) 426-  
9264 Contract UMTA-NY-06-0078

STATUS: Active NOTICE DATE: Apr. 1984  
START DATE: Sept. 1979 COMPLETION DATE: Jan. 1986  
TOTAL FUNDS: \$800,000  
ACKNOWLEDGMENT: UMTA

15 385038

**ENERGY CONSERVATION POTENTIAL OF SUBWAY STRUCTURES**

Objective: Study feasibility and economics of using unique thermal characteristics of subway tunnel air to reduce operating costs of air-assisted heat pumps located in buildings adjacent to tunnels. Scope: Perform modelling, data acquisition/reduction/evaluation to build prototype test system, fabricate system, and test and evaluate. Document findings.

Investigators were from Levinson Zapravskis Associates.

PERFORMING AGENCY: Philadelphia, City of, Pennsylvania, PA-06-  
0069

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Sing, FL (URT-12) Tel (202) 426-  
9264 Contract PA-06-0069

STATUS: Active NOTICE DATE: Apr. 1984  
START DATE: Mar. 1984 COMPLETION DATE: Mar. 1986  
TOTAL FUNDS: \$231,000  
ACKNOWLEDGMENT: UMTA



**16 385009**

**SURVEY BUS FACILITY PROBLEMS**

The objective of this project is to improve fixed bus facility design, operation, and maintenance through the examination and resolution of selected problems. A survey of 8 transit systems will be conducted to determine existing problems in bus facility design, operation, or maintenance. Resulting information can provide transit systems with information that can be used in the design of new facilities and modifications of facilities to improve maintenance and reduce costs.

PERFORMING AGENCY: Comprehensive Technologies International, Inc, UMTA-VA-06-0108  
 INVESTIGATOR: Theobald, P Tel (703) 352-4191  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Asatoorian, SD (URT-21) Tel (202) 426-8483 Contract UMTA-VA-06-0108  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Sept. 1983 COMPLETION DATE: May 1984  
 TOTAL FUNDS: \$80,000  
 ACKNOWLEDGMENT: UMTA

**16 385010**

**BUS MAINTENANCE FACILITY COST DATA BASE AND FUNCTIONAL LAYOUT**

This project has two specific objectives: 1) develop and implement a bus maintenance facility cost database from information obtained from facilities constructed under the UMTA program; cost information can be used by transit authorities in the planning and costing of new facilities and by UMTA personnel in reviewing applications for capital grants; and 2) conduct a study to develop guidelines for bus maintenance facility functional layout which will define optimum equipment arrangements for improving maintenance efficiency and reducing costs. Results, in form of a report will be widely disseminated to transit industry as well as to architectural and engineering societies to assure that future bus facilities are designed from a functional standpoint.

PERFORMING AGENCY: Comprehensive Technologies International, Inc, UMTA-VA-06-0116  
 INVESTIGATOR: Theobald, P Tel (703) 352-4191  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Asatoorian, SD (URT-21) Tel (202) 426-8483 Contract UMTA-VA-06-0116  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: June 1984 COMPLETION DATE: Dec. 1985  
 TOTAL FUNDS: \$200,000  
 ACKNOWLEDGMENT: UMTA

**16 385011**

**VALUE ENGINEERING**

The objective of this project is to establish and demonstrate Value Engineering as a valuable tool in the design of functional and cost effective bus facilities. Value Engineering is a technique used in facility designs in industries not yet applied to the transit industry. Application of this established technique to bus maintenance facilities promises to cut millions of dollars in life cycle costing.

PERFORMING AGENCY: Washington Metropolitan Area Transit Authority, UMTA-DC-06-0461  
 INVESTIGATOR: Monoukian, P Tel (202) 637-1340  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Asatoorian, SD (URT-21) Tel (202) 426-8483 Contract UMTA-DC-06-0461  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: May 1984 COMPLETION DATE: Jan. 1985  
 TOTAL FUNDS: \$45,000  
 ACKNOWLEDGMENT: UMTA

**16 385015**

**PEER REVIEW APPLICATIONS STUDY**

The objective of this project is to establish peer review as an accepted procedure in the design review of bus maintenance facilities. The study will assess the expected benefits and cost of the peer review process and propose an implementation plan for its application in the planning and design of bus maintenance facilities. Application of the peer review process in rail projects has saved millions of dollars; application of this technique to bus facilities can save substantial amounts of money.

PERFORMING AGENCY: ARAWAK Consulting Corporation, UMTA-VA-06-0110

INVESTIGATOR: Reynol, L Tel (703) 243-0300  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Asatoorian, SD (URT-21) Tel (202) 426-8483 Contract UMTA-VA-06-0110  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Oct. 1983 COMPLETION DATE: May 1984  
 TOTAL FUNDS: \$59,000  
 ACKNOWLEDGMENT: UMTA

**16 385016**

**INNOVATIVE BUS LIFT EQUIPMENT**

The objective of this project is to evaluate the performance and cost benefits of an innovative bus lift system. The study will test and evaluate two innovative bus lifts capable of accommodating various size buses, and collect performance and life cycle cost data to determine cost benefits of the lifts over conventional bus lifts. The rationale is that innovative lifts can accept vehicles varying in length up to 60 feet and width from 48 to 102 inches without special adaptors. The lifts will reduce maintenance time and improve safety.

PERFORMING AGENCY: Central Ohio Transit Authority, UMTA-OH-06-0045

INVESTIGATOR: Fraser, S Tel (614) 275-5888  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Izumi, G (URT-20) Tel (202) 426-8483 Contract UMTA-OH-06-0045  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Oct. 1983 COMPLETION DATE: Mar. 1985  
 TOTAL FUNDS: \$80,000  
 ACKNOWLEDGMENT: UMTA

17 372987

**HOMOPOLAR LINEAR SYNCHRONOUS MOTORS (HLSM) INVESTIGATION**

Objective: to carry out an assessment of the HLSM as a potential alternative drive to the linear induction motor (LIM) for an intermediate capacity transit system (ICTS) scope: 1) conduct comprehensive review of the state-of-knowledge of HLSM's and assess analytic approaches; 2) define a design specification for the HLSM based on ICTS LIM propulsion requirements; 3) develop analytical techniques to assess motor design performance; 4) conduct design study and evaluate performance achievements of proposed design; Project Summary: 5) evaluate control schemes to optimize performance; 6) make preliminary design of test motor; 7) investigate manufacturing capabilities and estimate cost of motor; and 8) conduct an HLSM system evaluation as a replacement to the LIM system in the ICTS application.

PERFORMING AGENCY: Canadian Institute of Guided Ground Transport, PRO-096

INVESTIGATOR: Eastham, AR Tel (613) 547-5777 Dawson, DG Atherton, D Slemon, G

SPONSORING AGENCY: Transportation Development Center Contract OSD82-00047

STATUS: Active NOTICE DATE: May 1983

START DATE: June 1982 COMPLETION DATE: Sept. 1983

TOTAL FUNDS: \$106,355

ACKNOWLEDGMENT: CIGGT

17 384966

**RESEARCH AND TRAINING**

To determine the visual aesthetic impacts of AGT guideways; to analyze electric power and energy requirements and real time power measurements for AGT systems; to investigate the potential for the integration of AGT systems with other transportation modes; to study the optimization of AGT route alignment in determining modal split; to conduct a feasibility study of the transfer of total energy requirements for AGT vehicles at each station; and to identify and evaluate the methods and impacts of designing and implementing an integrated fare collection and pricing system for transportation agencies. In addition to the 6 research projects designed to meet program objectives, a series of seminars will be initiated and held four times a year. It is intended that recognized leaders from industry, government, city, state and federal agencies will be invited to speak on the activities which constitute the research portion of the program.

PERFORMING AGENCY: West Virginia University

INVESTIGATOR: Elias, S Tel (304) 293-4550

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Meade, JZ (URT-32) Tel (202) 426-0082 Grant WV-11-0003-01

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: July 1980

TOTAL FUNDS: \$350,000

ACKNOWLEDGMENT: UMTA

17 385035

**INTERATED MAGNETIC SUSPENSION AND PROPULSION DEVELOPMENT**

Development and testing of critical technology to provide both magnetic suspensions and linear induction motor propulsion in a single integrated system. Hardware includes solid state power conditioning unit, linear induction motor primary and secondary gap sensors, and laboratory test stand. Repeatable levitation results have been achieved during 1983, and combined levitation and linear motion are expected in 1984.

PERFORMING AGENCY: Boeing Aerospace Company, WA-06-0014

INVESTIGATOR: Gilliland, R Tel (206) 251-4613

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Hoyler, RC (URT-12) Tel (202) 426-0090 Contract 60-80-C-71009

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Sept. 1979 COMPLETION DATE: Sept. 1985

TOTAL FUNDS: \$3,939,000

ACKNOWLEDGMENT: UMTA

17 385036

**PHASE IIB AGRT DEVELOPMENT**

Development and testing of high performance command and control system to achieve safe operation of small vehicles at 3 second headways. Includes redundant microprocessor-based moving block control system, and inductive two-way vehicle-wayside voice and data communications system. Test track under construction to demonstrate control system on small air-cushion vehicles.

PERFORMING AGENCY: Otis Elevator Company, CO-06-0011

INVESTIGATOR: Haines, G Tel (303) 343-8780

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Hoyler, RC (URT-12) Tel (202) 426-0090 Contract UT-80042

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Sept. 1979 COMPLETION DATE: Sept. 1985

TOTAL FUNDS: \$25,248,000

ACKNOWLEDGMENT: UMTA

17 385037

**PHASE IIB AGRT DEVELOPMENT**

Development and testing of high performance command and control system to achieve safe operation of small vehicles at 3 second headways. Includes redundant microprocessor-based moving block control and safety system, inductive two-way vehicle-wayside data communications system, and fiber optic noise-immune interfaces. Testing to be carried out on rail vehicles at DOT Pueblo Test Facility.

PERFORMING AGENCY: Boeing Aerospace Company, WA-06-0011

INVESTIGATOR: Christenson, D Tel (206) 251-4619

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Hoyler, RC (URT-12) Tel (202) 426-0090 Contract UT-80041

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Sept. 1979 COMPLETION DATE: Sept. 1985

TOTAL FUNDS: \$28,082,000

ACKNOWLEDGMENT: UMTA

21 369375

**ENERGY MANAGEMENT OF ELECTRIC RAIL TRANSIT SYSTEMS**

Rapidly increasing electric energy costs have resulted in rising operating costs for transit authorities operating electric rail systems. The objective of this research is to provide guidelines for transit authorities to lower peak electric demand and costs. The study will identify contributing factors that produce peak demand and the significance and timing of each. Monitoring strategies and conservation opportunities will be examined. Load management techniques will be identified, along with their benefit cost analyses and effectiveness in reducing demand. Strategies will be developed so that the benefits of peak demand management are reflected in rates. It is intended that research will result in methods for forecasting peak electric energy demand, monitoring the actual demand, and controlling the demand. Data have been collected from four transit agencies and analyzed. Monitoring strategies have been identified for controlling peak demand and costs of the various strategies are being determined. Load management techniques are being evaluated using simulation models.

**REFERENCES:**

Reduction of Peak-Power Demand for Electric Rail Transit Systems, Uher, RA, Transportation Research Board, NCTRP, Rpt 3, Dec. 1983, TRIS 382581

PERFORMING AGENCY: Carnegie-Mellon University

INVESTIGATOR: Uher, RA Tel (412) 578-2960

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Smith, HA Tel (202) 334-3224

NCTRP 54-2

STATUS: Completed NOTICE DATE: Dec. 1982

START DATE: Oct. 1981 COMPLETION DATE: Dec. 1983

TOTAL FUNDS: \$135,115

ACKNOWLEDGMENT: National Cooperative Transit Res &amp; Dev Program

21 372974

**EXTRABOARD MANAGEMENT: PROCEDURES AND TOOLS**

When an open run is created, either through operator illness, special assignment, or leave, the dispatcher has several choices. He can leave the run open, fill it with an extraboard or part-time person, or fill it with an operator working overtime on a regular day off. The above choices have financial and service impacts. To accomplish the objective of this research, the following tasks are proposed: Task 1-Perform a detailed survey of transit systems worldwide to determine how the problem being researched is handled in each system. Review the work of the computer industry and others which may be relevant to the problem and its solution. Examine existing computerized payroll systems, particularly interactive systems for possible solutions. Task 2- Analyze existing manual and automated dispatching systems to define requirements for any comprehensive system. Task 3-Prepare conceptual design and program development of software. Task 4-Produce manuals, software documentation for operators, users, and programmers. (The above tasks should be performed in conjunction with a review by transit systems with field tests included. The intent is to develop a generalized package capable of application at many properties once refinement for individual labor contract requirements is made.) Task 5-Prepare a final report describing the research and its results. Include an assessment of the future potential of the package, as well as a cost/benefit analysis of such automation (Because there are concerns as to the feasibility of developing such a system, the subject will be addressed first through a TRB synthesis of how existing systems function and perform and to document any problems attendant to their development).

PERFORMING AGENCY: MacDorman (LC)

INVESTIGATOR: MacDorman, LC Tel (703) 237-8500

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Copas, T Tel (202) 344-3242 NCTRP 60-1, TS-5

STATUS: Active NOTICE DATE: May 1984

START DATE: Nov. 1983 COMPLETION DATE: Oct. 1984

TOTAL FUNDS: \$40,000

ACKNOWLEDGMENT: National Cooperative Transit Res &amp; Dev Program

21 372978

**CONVERSION TO ONE-PERSON OPERATION OF HEAVY-RAIL RAPID-TRANSIT TRAINS**

Each of the new rapid transit systems is designed to allow the motorman at the head of the train to monitor passenger loading, unloading, and the operation of the doors. Older rapid transit systems in Boston, New York, Philadelphia, Cleveland, Chicago, and Toronto were not designed for one-man operation. Because both island and side platforms exist, and most of their existing rolling stock is equipped with either left-or right-hand cabs, the older properties continue to require a conductor on each train. At the present, the physical conversion of these older systems to accommodate one-man operation requires full-width cabs, a very capital-cost-intensive retrofit. Given the average life of a car, it would take many years to implement the changeover with new equipment only. The objective of this research is to determine whether present technology can allow for adequate inspection of door operation on both sides of a train by a motorman located in a right-or a left-hand cab (i.e., closed-circuit television, etc.). If such a system can be found to be safe and reliable, the potential operating-cost savings would be staggering. This research proposes the following work program: Task 1-Perform a survey of the operation of each of the older two-man rapid transit properties in North America. The goal of this survey will be to determine the operational and safety requirements of each property related to the implementation of one-man train operation. Task 2-Perform a survey of one-man conversions implemented by rapid transit systems worldwide. Task 3-Evaluate the state-of-the-art with regard to electronic visual aids to determine whether it can be applied to older rapid transit systems in such a way as to satisfy the operational and safety requirements determined in Task 1. This will include the performance of a small-scale test on one route of one property to determine the operational and safety impacts of such a system. Task 4-Prepare a final report describing the research and analyzing the results. It would then draw a conclusion as to the technical feasibility of implementing one-man operation on older rapid transit systems without major capital expenditures.

PERFORMING AGENCY: Battelle Memorial Institute

INVESTIGATOR: Hoess, JA Tel (614) 424-6424

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Kingham, RI Tel (202) 334-3224 NCTRP 55-1

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: May 1984 COMPLETION DATE: Apr. 1985

TOTAL FUNDS: \$150,000

ACKNOWLEDGMENT: National Cooperative Transit &amp; Dev Program

21 372981

**ESTIMATING INCREMENTAL COSTS OF BUS-ROUTE-SERVICE CHANGES**

The objective of this research is to develop formulas to estimate the marginal cost to provide transit service on a given route. In particular, the research will attempt to determine the difference in cost of peak versus base service. A representative sample of transit systems with varying characteristics should be analyzed. The following characteristics should be considered: transit system/fleet size (large, medium, small); service area (urban/rural). The study will analyze the scheduling and run-cutting procedures of each system and the effect of high levels of peak service on total cost. Cost items which show a high correlation with the number of peak vehicles will be identified. To accomplish this research the following tasks are proposed: Task 1- Identify systems to be studied. Preference should be given to a system which has RUCUS, as this will simplify the analysis of run-cutting procedures. Task 2-Identify and analyze previous work in this area. Document the strengths and weaknesses of each cost-estimation formula. Task 3-Develop transferable costing models which differentiate between the cost of peak and base service and which allow marginal cost analysis of peak and/or base service additions. Task 4-Document the findings of the study and the cost models developed. The documentation should include programs developed for implementation on a mini-computer.

PERFORMING AGENCY: System Design Concepts, Incorporated

INVESTIGATOR: Cohen, HS Tel (202) 393-5910

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Kingham, RI Tel (202) 334-3224 NCTRP 40-2

STATUS: Active NOTICE DATE: May 1984  
 START DATE: Nov. 1983 COMPLETION DATE: Aug. 1985  
 TOTAL FUNDS: \$150,000  
 ACKNOWLEDGMENT: National Cooperative Transit Res & Devel  
 Program

**21 372986**  
**SIMULATION OF BUS ROUTES FOR SCHEDULING**  
**IMPROVEMENTS**

This grant shall develop a bus simulation model capable of analyzing alternative schedules and schedules and schedule adjustments. The purpose of the task is to determine the best schedule in terms of resource saving while providing an adequate level of service to passengers and to provide an analytical tool for evaluating various dispatching, regulating and other operational strategies. The basic input data for the model will be supplied by the AVM system in Los Angeles.

PERFORMING AGENCY: Massachusetts Institute of Technology  
 INVESTIGATOR: Wilson, NHM Tel (617) 253-5046  
 SPONSORING AGENCY: Transportation Systems Center Contract  
 DTRS-75-80c-00011  
 STATUS: Active NOTICE DATE: May 1983  
 START DATE: Nov. 1982 COMPLETION DATE: Nov. 1983  
 TOTAL FUNDS: \$49,998  
 ACKNOWLEDGMENT: Massachusetts Institute of Technology

**21 384918**  
**STRUCTURING THE TRANSIT SERVICE PLANNING**  
**PROCESS TO IMPROVE PRODUCTIVITY**

To evaluate the alternative approaches to improving the transit service planning process, focusing on the likely cost and other resources required for their implementation, as well as benefits achievable. A major outcome anticipated from the research will be a set of recommendations on the most highly leveraged actions that can be taken to improve the service planning process, considering the initial conditions in the transit property. A combination of theoretical and empirical analysis will be used in this research project. The theoretical approach will quantify the cost and benefits hypothesized for each action, while the empirical component will focus on the experience of those properties making use of each action.

PERFORMING AGENCY: Massachusetts Institute of Technology  
 INVESTIGATOR: Wilson, N Tel (617) 253-5046  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Jasper, N (URT-33) Tel (202) 426-  
 0080 Contract UMTA-MA-11-0041  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1983 COMPLETION DATE: Aug. 1984  
 TOTAL FUNDS: \$40,000  
 ACKNOWLEDGMENT: UMTA

**21 384931**  
**DEVELOPMENT OF A TIME-SERIES BASED TRANSIT**  
**PATRONAGE MODEL TO ASSIST DECISION-MAKERS IN**  
**THE EVALUATION OF ALTERNATIVE SERVICE LEVEL AND**  
**FARE STRATEGIES**

To develop a time-series based transit demand model for application in small and medium sized urban areas. Two statistical techniques will be utilized in the model development process: multiple regression techniques modified for time series use and the Box-Jenkins technique using auto-regression moving (ARIMA) class models for time series analysis. The products of this research will focus on both information and techniques usable in the transit operation environment.

PERFORMING AGENCY: Iowa University, UMTA-IA-11-0005  
 INVESTIGATOR: Stoner, JW Tel (319) 353-6064  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Hillegass, TJ (URT-33) Tel (202) 426-  
 4271 Grant UMTA-IA-11-0005  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1983 COMPLETION DATE: Aug. 1984  
 ACKNOWLEDGMENT: UMTA

**21 384941**  
**A STUDY OF THE USE OF MICROCOMPUTER**  
**TECHNOLOGY IN PLANNING AND OPERATION OF SMALL**  
**CITY TRANSPORTATION SYSTEMS**

To identify and categorize a list of existing and potential planning and administrative applications of microcomputers for small city transportation systems. Hardware and software capabilities of popular microcomputers currently on the market will be studied in order to determine their usefulness for small city transportation systems. The study will also use a planning and transportation operations scenario for a small city to demonstrate the use of microcomputers. A comparison of 8-bit and 16-bit microcomputers will also be undertaken to explore what additional tasks may be solved with 16-bit microcomputers.

PERFORMING AGENCY: Tuskegee Institute, UMTA-AL-06-0011  
 INVESTIGATOR: Sara, T Tel (205) 727-8116  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Neigut, E (URT-33) Tel (202) 426-  
 9271 Grant UMTA-AL-06-0011  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1983 COMPLETION DATE: July 1984  
 ACKNOWLEDGMENT: UMTA

**21 384945**  
**BI-LEVEL OPTIMIZATION MODEL FOR INVESTIGATING**  
**FARE AND SERVICE FUNCTIONS TO MINIMIZE URBAN**  
**TRANSIT OPERATING DEFICITS**

To develop an optimization model that can be used to minimize the operating deficits of transit operators by integrating the fare and service structures of the systems. Relevant system characteristics of supply and demand will be modeled as constraints. The analysis will be carried out at both the system and route levels. Solutions resulting from the model are expected to provide the operating deficits at systems levels while maximizing revenue at the route levels. Transit productivity and efficiency will be incorporated directly in the model. After models have been developed, it is expected that real world applications will become readily usable tools to aid transit operators in financial planning.

PERFORMING AGENCY: Utah University  
 INVESTIGATOR: Yu, J Tel (804) 581-9701  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Fisher, RJ (URT-33) Tel (202) 426-  
 9271 Grant UMTA-UT-11-0003  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1983 COMPLETION DATE: Aug. 1984  
 ACKNOWLEDGMENT: UMTA

**21 384973**  
**BUS ROUTE DEMAND ANALYSIS**

This research will develop and operationally prototype a computer-based route transit patronage analysis system for applications by transit agencies where route coverage is being expanded or contracted, or where routes are being modified. This would be in response to customer requests, political considerations, and financial demands. The models would fundamentally be based on applications which make use of the "Transportation Network Evaluation System" (TRANES) program developed in San Diego and a GBF/DIME file with 1980 census block data. The transit system of the Central Oklahoma Transportation and Parking Authority (COTPA) would be used as the case study application. Potential models would be drawn from literature review with emphasis on those which are practical in an operating transit environment and have "quick-response" attributes. A prototype route analysis package will be designed which might include financial impacts of route modifications. The project takes advantage of close ties with COTPA and the present availability of the necessary computer software.

PERFORMING AGENCY: Oklahoma University  
 INVESTIGATOR: Cook, AR Tel (404) 325-5911  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Hillegass, TJ (URT-41) Tel (202) 426-  
 9271 Grant OK-11-0003  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1982  
 TOTAL FUNDS: \$60,328  
 ACKNOWLEDGMENT: UMTA

## 21 385017

### RELIABILITY AND PRODUCTIVITY IMPROVEMENTS

An UMTA developed automated data collection system is now operational at the Southern California Rapid Transit District system in Los Angeles, California. This project will develop a battery of computer programs to summarize and analyze the collected data for improved planning and scheduling.

PERFORMING AGENCY: Multisystems, Incorporated, UMTA-MA-06-0049; Southern California Rapid Transit District, UMTA-CA-06-0171

INVESTIGATOR: Menhard, HR Tel (617) 864-5810

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Goodman, JM (URT-31) Tel (202) 426-4984 Contract UMTA-MA-06-0049

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Jan. 1982 COMPLETION DATE: Jan. 1985

TOTAL FUNDS: \$332,500

ACKNOWLEDGMENT: UMTA

## 21 385040

### DEVELOPMENT OF ENERGY MANAGEMENT GUIDELINES FOR RAIL SYSTEMS

Objective: Develop guidelines for transit operators to develop energy conservation strategies. Scope: Refine Energy Management Model; develop guidelines for (1) conserving energy during design/construction/operations, (2) regeneration and energy storage; performance modification; development of optimum power rate structures. Train transit industry in the practical applications of guidelines.

PERFORMING AGENCY: Carnegie-Mellon University, PA-06-0083

INVESTIGATOR: Uher, RA Tel (412) 578-2960

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Sing, FL (URT-12) Tel (202) 426-9264 Contract PA-06-0083

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: July 1983 COMPLETION DATE: Apr. 1985

TOTAL FUNDS: \$225,000

ACKNOWLEDGMENT: UMTA

## 21 385089

### TRANES DEVELOPMENT PROJECT

The Transportation Network Evaluation System (TRANES) is a computer program for route analysis. It uses CENSUS GBF/DIME file data to accumulate demographic data for blocks within walking distance of specified transit stops. This project intends to thoroughly document and convert the program to operate on the IBM 4300 series under VM/CMS operating system.

PERFORMING AGENCY: Puget Sound Council of Governments, UMTA-WA-06-0022

INVESTIGATOR: Frysetacki, W Tel (202) 464-6174

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Hillegass, TJ (URT-41) Tel (202) 426-9271 Contract UMTA-WA-06-0022

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: July 1982 COMPLETION DATE: May 1984

TOTAL FUNDS: \$149,820

ACKNOWLEDGMENT: UMTA

22 369376

**GUIDELINES FOR ALLOCATION OF TIME FOR TRANSIT COACH MAINTENANCE FUNCTIONS**

This study will review available information on standard maintenance practices for transit coaches and investigate current use of, and attempts to develop and institute, standard maintenance job times. The synthesis of this information should include procedures and examples. Specific maintenance tasks that should be covered include the following: Air conditioning systems, transmissions, brakes, preventive maintenance, engine, electric system (including generators and starters), air system, and other major cost items.

Report in preparation

PERFORMING AGENCY: XYZYX Information Corporation, Incorporated  
 INVESTIGATOR: Inaba, K Tel (213) 883-8200  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Copas, TL Tel (202) 334-3242 NCTRP 60-1, TS-4  
 STATUS: Completed NOTICE DATE: Apr. 1984  
 START DATE: Dec. 1982 COMPLETION DATE: Nov. 1983  
 TOTAL FUNDS: \$30,000  
 ACKNOWLEDGMENT: National Cooperative Transit Res & Dev Program

22 372977

**PUBLIC TRANSIT BUS MAINTENANCE POWER PLANNING**

Proper manpower planning in maintenance and transportation is crucial to the efficient and economical operation of a transit authority. However, manpower planning is often accomplished in a very inexact manner based heavily on past experience and guesswork which may not be appropriate for transit systems experiencing either major service expansion or severe service attacks. Transit systems need guidance on using the most innovative and effective manpower planning techniques. The research will be accomplished by completing the following tasks: Task 1-Survey a representative sample of U.S. transit systems to identify manpower planning techniques by examining fleet size and age, operating miles and hours, contractual obligations, and other factors that affect manpower requirements. Task 2-Evaluate the manpower planning techniques identified in the survey and rate them according to established measures of productivity. Task 3-Document, in a handbook for industry use, the most innovative and effective transportation and maintenance manpower planning techniques.

PERFORMING AGENCY: Fleet Maintenance Consultants, Inc.  
 INVESTIGATOR: Drake, RW Tel (713) 496-7717 Mundle, SR Tel (215) 627-5450  
 SPONSORING AGENCY: Urban Mass Transportation Administration NCTRP 33-3  
 STATUS: Active NOTICE DATE: May 1984  
 START DATE: Nov. 1983 COMPLETION DATE: Oct. 1984  
 TOTAL FUNDS: \$100,000  
 ACKNOWLEDGMENT: National Cooperative Transit Res & Devel Program

22 384929

**ANALYSIS OF BUS MAINTENANCE OPERATIONS**

To develop a guide for transit maintenance management, and a case study of maintenance operations of the Tidewater Transportation District Commission. The results of the dual studies are synthesized to permit a balance between theory and practice. The guide will assist in understanding, evaluating and reviewing a transit property's maintenance program and needs. It will also demonstrate a useful strategy for documenting the bus maintenance program for a transit property and identify the characteristics of a successful maintenance operation. The results of this study will be used to formulate recommendations for bus maintenance management.

PERFORMING AGENCY: Virginia University, UMTA-VA-11-0012  
 INVESTIGATOR: Demetsky, M Tel (804) 924-7464  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Hughes, PG (URT-33) Tel (202) 426-9274 Grant UMTA-VA-11-0012  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1983 COMPLETION DATE: Aug. 1984  
 TOTAL FUNDS: \$81,262  
 ACKNOWLEDGMENT: UMTA

22 384932

**DEVELOPMENT OF A MANAGEMENT TECHNIQUES GUIDE FOR BUS FLEET MANAGERS**

To develop a pocket calculator-based guide to bus fleet management. The potential user of the guide will not be required to have extensive mathematical skills or access to a computer. Instead, the user of described techniques will require only paper, pencil and a basic understanding of algebra. All numerical information required will be prepared and presented in tables, charts or nomographs. A key part of the project will be the organization of a steering committee made up of transit industry maintenance managers, UMTA staff and related professionals. Topics to be covered in the guide will include, maintenance data collection, sampling failure forecasting, life-cycle costing, preventive unit replacement, inventory management, break-even analysis, available maintenance information systems and future directions in computer based-bus maintenance planning.

PERFORMING AGENCY: Oklahoma University, UMTA-OK-11-0004  
 INVESTIGATOR: Maze, T Tel (405) 325-5911  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Hughes, PG (URT-33) Tel (202) 426-9274 Grant UMTA-OK-11-0004  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1983 COMPLETION DATE: July 1984  
 ACKNOWLEDGMENT: UMTA

22 384958

**COMPUTERIZED BUS RECORDS ANALYSIS**

Data collected by various transit agencies using computerized data collection systems will be analyzed to determine major bus hardware failure patterns and establish need for specific UMTA research and development. Also to be developed are requirements for implementing a maintenance data reporting system for identifying equipment problems. If automated data systems can identify problems and their causes, then a faster procedure can be implemented to address operational problems and to reduce operating and maintenance costs of local transit agencies.

PERFORMING AGENCY: Technology Research and Analysis Corporation, UMTA-VA-06-0093  
 INVESTIGATOR: Yen, T Tel (703) 522-2440  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483 Contract UMTA-VA-06-0093  
 STATUS: Active NOTICE DATE: Apr. 1984  
 ACKNOWLEDGMENT: UMTA

22 384968

**DEVELOPMENT OF CASE STUDY MATERIAL DOCUMENTING BUS MAINTENANCE PLANNING AND PRACTICE AT SELECTED TRANSIT PROPERTIES**

Maintenance has long been a low visibility function at many transit properties. As long as schedules were met, and budgets were adequate, most public attention was focused on the transportation and scheduling departments' operation. Now, however, properties are facing a gradual phasing-out of UMTA operating subsidies and local revenues are being demanded for a number of purposes, only one of which is transit funding. This project includes five tasks aimed at the development of a descriptive body of information about bus maintenance planning methods and practices. The major focus of the research is the development of six case studies for use in evaluating the feasibility of using the prescriptive models found in the existing literature, and for evaluating the cost and benefits of federal policy options. Analysis of the case studies will be presented in synthesis chapters outlining the diversity of practices at the local level, and enumerating the effects which uniform procedures or planning requirements would have if implemented. The research will be of interest to policy planners, technical staff, and transportation researchers and educators.

PERFORMING AGENCY: Illinois University, Chicago  
 INVESTIGATOR: Foerster, JF Tel (312) 996-2161  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Hallman, AB (UPM-43) Tel (202) 426-9257 Grant IL-11-0030  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1982  
 TOTAL FUNDS: \$82,277  
 ACKNOWLEDGMENT: UMTA

**22 385005**

**MAIN PRODUCTIVITY INDEXES (LCC SUPPORT FROM UNIVERSITIES)**

The purpose of this project is to conduct a study to develop a maintenance management data base system for collection of life cycle costing (LCC) data. The study shall be conducted for a small to medium-sized transit system that has no computerized maintenance management information system. Information gained from this study will be disseminated to transit systems so that they could apply the techniques developed and use the information to make management decisions and compare it with other transit systems.

PERFORMING AGENCY: Oklahoma University, UMTA-OK-06-0004  
 INVESTIGATOR: Maze, T Tel (405) 325-5911  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Asatoorian, SD (URT-21) Tel (202) 426-8483 Contract UMTA-OK-06-0004  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: June 1984 COMPLETION DATE: June 1985  
 TOTAL FUNDS: \$150,000  
 ACKNOWLEDGMENT: UMTA

**22 385006**

**VALUE ENGINEERING**

The objective of this study is to establish Value Engineering as a valuable tool in the design of functional and cost effective bus facilities. Value Engineering is a technique used in facility design in industries but not applied to the transit industry. Application of this established technique to main facilities promises to cut millions of dollars for the LCC.

PERFORMING AGENCY: Greater Bridgeport Transit District, UMTA-CT-06-0015  
 INVESTIGATOR: Mitchell, S Tel (203) 366-7070  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Asatoorian, SD (URT-21) Tel (202) 426-8483 Contract UMTA-CT-06-0015  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Jan. 1984 COMPLETION DATE: Oct. 1984  
 TOTAL FUNDS: \$44,700  
 ACKNOWLEDGMENT: UMTA

**22 385022**

**AUTOMATE AND UPGRADE MAINTENANCE MANAGEMENT INFORMATION**

The objective of this project is to assist the Port Authority of Allegheny County in upgrading and automating its Maintenance Management Information System (MMIS) for the light rail transit system. A requirements analysis will be conducted to establish system parameters and performance. The MMIS will then be designed, specified and procured.

After debugging, the system will be placed in service and evaluated in comparison with project objectives.

PERFORMING AGENCY: Port Authority of Allegheny County, UMTA-PA-06-0085  
 INVESTIGATOR: Sedlock, R Tel (412) 237-7000 Mundo, J  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Mora, JG (URT-10) Tel (202) 426-9264 Contract UMTA-PA-06-0085  
 STATUS: Active NOTICE DATE: Apr. 1984  
 TOTAL FUNDS: \$250,000  
 ACKNOWLEDGMENT: UMTA

**22 385026**

**UPGRADE PORT AUTHORITY TRANSIT CORPORATION'S MAINTENANCE MANAGEMENT INFORMATION SYSTEM**

PATCO will conduct a short system requirements study to define precise needs for its upgraded Maintenance Management Information System (MMIS). It will then translate user requirements into design and contractual specifications. Computer hardware and software will be purchased; the system will be set up and employees trained, and the upgraded MMIS will be tested and debugged for a short time period.

PERFORMING AGENCY: Port Authority Transit Corporation, UMTA-NJ-06-0018  
 INVESTIGATOR: Krant, B Tel (609) 772-6900  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Mora, JG (URT-10) Tel (202) 426-9264 Contract UMTA-NJ-06-0018  
 STATUS: Active NOTICE DATE: Mar. 1984  
 TOTAL FUNDS: \$179,000  
 ACKNOWLEDGMENT: UMTA

**22 385099**

**BUS MAINTENANCE WORKSHOP**

To develop input for future program development, bus maintenance workshops will be held with transit operating agencies, manufacturers, suppliers and local governments. Workshop will provide a forum to improve service quality and reduce maintenance expenditures, providing UMTA with information for formulating its programs and providing the transit bus industry with an understanding of the technical assistance role.

PERFORMING AGENCY: Transportation Research Board, UMTA-DC-06-0441  
 INVESTIGATOR: Clary, A Tel (202) 334-3220  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Lopez, RA (URT-21) Contract UMTA-DC-06-0441 Tel (202) 426-8483  
 STATUS: Active NOTICE DATE: Apr. 1984  
 TOTAL FUNDS: \$50,000  
 ACKNOWLEDGMENT: UMTA

23 193262

**UNION-MANAGEMENT PROGRAMS IN URBAN TRANSIT**

To provide a forum for union and management representatives in the municipal transit industry, to identify those labor relations problems on which union and management are willing to work co-operatively, and to develop options for UMTA which will help labor and management resolve these problems.

**REFERENCES:**

Labor-Management Conference on Issues in Urban Transit Summary Report, Aug 1978

PERFORMING AGENCY: Wisconsin University, Madison

INVESTIGATOR: Stern, JL Tel (608) 262-8789

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Erickson, R Tel (608) 262-3822

Contract DOT-WI-11-0006

STATUS: Active NOTICE DATE: Jan. 1984

START DATE: June 1978

TOTAL FUNDS: \$78,525

ACKNOWLEDGMENT: Wisconsin University, Madison

23 333857

**DEVELOP KNOWLEDGE AND PERFORMANCE TEST FOR HEAVY VEHICLE OPERATORS**

The objective of this project is to develop knowledge and performance tests to be used by State licensing authorities in the testing of applicants for a heavy vehicle operator's license. The general types of heavy vehicles to be addressed in this test development effort include large articulated and straight trucks and commercially operated buses. A number of studies will be conducted to identify those behaviors most critical to the operation of heavy vehicles which can be measured in a licensing setting and the most appropriate method for measuring these behaviors. Particular attention will be paid to the identification and measurement of those more basic and safe operating practices which are unique to the operation of heavy vehicles. Products to be developed in this research effort include: candidate knowledge tests, guidelines for establishing on-road performance test routes, scoring criteria, scoring methods, and appropriate manuals for applicants. A field test of this heavy vehicle operator licensing system will be conducted in California under the sponsorship of the California Department of Motor Vehicle.

PERFORMING AGENCY: National Public Services Research Institute

INVESTIGATOR: Edwards, ML Tel (703) 548-3444

SPONSORING AGENCY: National Highway Traffic Safety Administration

RESPONSIBLE INDIVIDUAL: Smith, M

STATUS: Active NOTICE DATE: Dec. 1981

START DATE: Aug. 1980 COMPLETION DATE: Aug. 1983

ACKNOWLEDGMENT: National Public Services Research Institute

23 349149

**ASSESSMENT OF JOB ENRICHMENT PROGRAMS FOR THE TRANSIT INDUSTRY**

The general objective of this research is to assess the feasibility of job enrichment programs for the transit industry for first-line supervisors and those they supervise. The assessment would include a survey and analysis of current techniques used to improve job satisfaction and productivity in transit as well as other fields with similar characteristics. The assessment would identify common barriers to the implementation of job enrichment programs in transit agencies including, but not limited to, cost, labor-management relationships, political climate, and resistance to change. The assessment would also include specific methods for measuring, monitoring, and evaluating the effectiveness and cost benefit of job enrichment programs.

**REFERENCES:**

Assessment of Quality-of-Work-life Programs for the Transit Industry, Clark, SG; Warren, KD; Greisinger, G, Transportation Research Board, NCTRP, Rpt. 5, Dec. 1983, TRIS 386406

Assessment of Quality-of-Work-Life Programs for Transit Industry. Model Programs, Transportation Research Board, NCTRP, Rpt.6, Dec. 1983, TRIS 386407

PERFORMING AGENCY: Public Administration Service

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Jencks, CF Tel (202) 334-3224  
NCTRP 33-2

STATUS: Completed NOTICE DATE: Apr. 1984

START DATE: Nov. 1982 COMPLETION DATE: Dec. 1983

TOTAL FUNDS: \$100,000

ACKNOWLEDGMENT: National Cooperative Transit Res and Dev Program

23 369372

**TRANSIT BUS OPERATOR SELECTION AND TRAINING FOR DEALING WITH STRESS**

This research is to provide an evaluative device or questionnaire for use as part of the bus-driver-selection process that will validly indicate the applicant's susceptibility to stress which is likely to affect job performance. Two training modules will be developed, designed to help newly hired operators anticipate and deal with typical stressful situations and the other designed to help supervisors recognize stress symptoms displayed by operators and provide guidance on appropriate courses of action.

**REFERENCES:**

Transit Bus Operator Selection and Training for Dealing Transportation Research Board, NCTRP, Rpt. 7, June 1984  
with Stress

PERFORMING AGENCY: Group Associated Management Services, Inc

INVESTIGATOR: Elliott, B Tel (313) 964-2790

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Spicher, RE Tel (202) 334-3224

NCTRP 33-1

STATUS: Completed NOTICE DATE: Dec. 1982

START DATE: Oct. 1981 COMPLETION DATE: Apr. 1984

TOTAL FUNDS: \$150,000

ACKNOWLEDGMENT: National Cooperative Transit Res & Dev Program

23 372983

**A TRAINING COURSE FOR PUBLIC TRANSIT PROFESSIONALS IN SMALL AND MEDIUM-SIZED CITIES**

The course will address issues resulting from reductions in the level of Federal transit subsidies, obliging local officials to use public resources more efficiently, to search for new sources of funds, and to review critically their existing fare policies. Local transit professionals will assist in the determination of course content and design, including format and scheduling, to ensure that timely and relevant topics are included. The collaborative effort of the Univ. of Massachusetts and Alabama State University will: 1) provide greater geographic representation among transit professionals, 2) allow two universities to interact with local transit professionals, 3) allow individuals with experience in transit research to work with individuals with expertise in business development and urban affairs, and 4) provide a greater opportunity for increased participation among minorities and women.

PERFORMING AGENCY: Massachusetts University, Amherst, 5-28801;

Alabama State Highway Department

INVESTIGATOR: Shuldiner, PW Tel (413) 545-2688 Collura, J Knight, T

SPONSORING AGENCY: Urban Mass Transportation Administration Contract MA-11-0040

STATUS: Active

START DATE: July 1982 COMPLETION DATE: June 1983

TOTAL FUNDS: \$84,585

ACKNOWLEDGMENT: Massachusetts University, Amherst

23 372984

**TRAINING PROGRAM FOR TRANSIT MIDDLE-MANAGERS**

Development of a comprehensive management training program for over 400 mid-level managers of the New York City Transit Authority. Course is based on actual case studies drawn from NYCTA files, and is participative in format. Principal subject areas include labor-management relations, grievance and disciplinary procedures, human resource management, work planning and control, budgetary and inventory analyses. The objective of the program is the improvement of managerial performance with existing constraints.

PERFORMING AGENCY: Polytechnic Institute of New York, M-TRAIN



INVESTIGATOR: Roess, R Tel (212) 643-5526 Schrier,  
D Falcocchio, J Allison, W Nanda, R  
SPONSORING AGENCY: New York City Transit Authority Contract  
STATUS: Active NOTICE DATE: May 1983  
START DATE: Sept. 1982 COMPLETION DATE: June 1983  
TOTAL FUNDS: \$84,000  
ACKNOWLEDGMENT: Polytechnic Institute of New York

**23 384921****TRANSPORTATION PROGRAM DEVELOPMENT FOR FUTURE MANPOWER NEEDS**

To develop programs and curricula which will efficiently and effectively address public transportation's manpower needs over the next 20 years.

PERFORMING AGENCY: Florida A & M University, UMTA-FL-06-0040

INVESTIGATOR: Taylor, AC Tel (904) 599-3597  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Bromall, IH (UCR-10) Tel (202) 426-6371 Grant UMTA-FL-06-0040  
STATUS: Active NOTICE DATE: Apr 1984  
START DATE: Oct. 1983 COMPLETION DATE: Sept. 1984  
TOTAL FUNDS: \$45,000  
ACKNOWLEDGMENT: UMTA

**23 384922****MANAGEMENT TRAINING AND HANDICAPPED STUDY**

To undertake management training and development for employees; to study handicapped needs; to facilitate hiring of handicapped employees.

PERFORMING AGENCY: Utah Transit Authority  
INVESTIGATOR: Pingree, JC Tel (801) 262-5626  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Bromall, IH (UCR-10) Tel (202) 426-6371 Contract UT-03-2001  
STATUS: Active NOTICE DATE: Apr. 1984  
START DATE: Sept. 1983  
TOTAL FUNDS: \$250,000  
ACKNOWLEDGMENT: UMTA

**23 384923****INTERNAL EEO PROGRAM DEVELOPMENT**

To develop internal EEO program to facilitate advancement of minorities and females.

PERFORMING AGENCY: Southeastern Pennsylvania Transportation Authority  
INVESTIGATOR: Gunn, DL  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Bromall, IH (UCR-10) Tel (202) 426-6371 Grant UMTA-PA-03-2003  
STATUS: Active NOTICE DATE: Apr. 1984  
START DATE: Sept. 1983  
TOTAL FUNDS: \$320,000  
ACKNOWLEDGMENT: UMTA

**23 384924****TEXAS STATE TRANSIT STUDY**

To identify Texas transit positions and training needs; to identify institutions to provide training; to develop training plan.

PERFORMING AGENCY: Texas Southern University, UMTA-TX-06-2001  
INVESTIGATOR: Lede, N Tel (713) 527-7011  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Bromall, IH (UCR-10) Tel (202) 426-6371 Contract UMTA-TX-06-2001  
STATUS: Active NOTICE DATE: Apr. 1984  
START DATE: Sept. 1983  
TOTAL FUNDS: \$100,000  
ACKNOWLEDGMENT: UMTA

**23 384935****THE INFLUENCE OF FINANCIAL INCENTIVE PROGRAMS ON EMPLOYEE PERFORMANCE AND ORGANIZATION PRODUCTIVITY WITHIN MASS TRANSIT**

To examine the influence that Financial Incentive Programs (FIP) have on employee performance and organizational productivity. The project effort will seek to determine the extent to which FIPs are used within the transit industry, how effective FIPs are judged to be by transit property management, and what characterized those transit properties which successfully utilized FIPs. The experience with FIPs which have been documented in the academic and professional literature will be systematically examined. The information will indicate how the different types of FIPs operated and what effect they had on organizations in which such programs have been empirically tested. All transit properties (1000-10000) will be surveyed to identify how extensively FIPs are used and how effective these programs have been. Follow-up phone interviews will be conducted with those properties that have had the most extensive experience with FIPs.

PERFORMING AGENCY: Virginia Polytechnic Institute & State University, UMTA-VA-11-0013

INVESTIGATOR: Scott, KD Tel (703) 961-5021  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Hughes, PG (URT-33) Tel (202) 426-9274

STATUS: Active NOTICE DATE: Apr. 1984  
START DATE: July 1983 COMPLETION DATE: Aug. 1984  
TOTAL FUNDS: \$45,556  
ACKNOWLEDGMENT: National Highway Traffic Safety Administration

**23 384938****TRANSIT OPERATIONS INSTITUTE: A MANAGEMENT DEVELOPMENT SEMINAR FOR WOMEN IN THE TRANSIT INDUSTRY**

To develop and conduct a one-week Institute which will provide professional growth and enhancement for women currently employed in submiddle-management levels and a few women students nearing completion of a transit related field of study. Both the scope and thrust of the Institute are designed in part, to help fill recently expressed women's needs in the transit industry, especially for new managerial personnel and to improve utilization of women throughout all levels of transit management. Issues to be addressed include major rail and bus operations, real and perceived problems regarding women in the transit field, skills and experience requirements and improved self-image for women regarding their own professional viability and their interaction with their peers, supervisors and subordinates.

PERFORMING AGENCY: Georgia Institute of Technology, UMTA-GA-11-0015

INVESTIGATOR: Ross, C Tel (404) 894-2350  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Meade, JZ (URT-33) Tel (202) 426-0080 Grant UMTA-GA-11-0015  
STATUS: Active NOTICE DATE: Apr. 1984  
START DATE: July 1983 COMPLETION DATE: July 1984  
ACKNOWLEDGMENT: UMTA

**23 384942****FUNCTIONAL TRAINING COURSES**

To develop academic training modules designed to promote and complement the skills of present in-service Dade County transportation personnel and Florida Memorial College students. The effort includes faculty and consultants with expertise in transportation management and behavioral and social scientists who are capable of expressing an interdisciplinary expertise which will be basic to constructing an innovative academic module: (1) to create a "research bank" on transportation management; (2) to produce a modified development plan for the Florida Memorial College Program in Transportation; (3) to effect an initial trial testing week of coursework for students; and (4) to issue detailed, specific, informative and verifiable reports on the total data, information experience and success of enrollees associated with the program.

PERFORMING AGENCY: Florida Memorial College, UMTA-FL-11-0011

INVESTIGATOR: DeShields, O Tel (305) 625-4141  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Enty, FE (URT-33) Tel (202) 426-9274 Grant UMTA-FL-11-0011  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1983 COMPLETION DATE: Aug. 1984  
 ACKNOWLEDGMENT: UMTA

**23 384943****A PROFILE AND ANALYSIS OF TRANSIT GENERAL MANAGERS, ASSISTANTS INCLUDING RELATIONSHIPS WITH THEIR GOVERNING BOARDS**

The objective of this project is to examine and analyze the position of general manager in public transit systems. The researchers will develop a profile of transit managers and their immediate assistants as it relates to such issues as qualifications/backgrounds, career advancement patterns, length of tenure (resignation or termination), age, perceptions of roles and performance, board-general manager relations, span of control and degree of responsibility, limitations/constraints on general manager, organizational structure and "management style". The study will develop a national profile on transit GMs and their Assistants with a broad range of characteristics.

PERFORMING AGENCY: Atlanta University, GA-11-0014  
 INVESTIGATOR: Brown, I Tel (404) 681-0251 x165 Davis, E  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Royal, AJ (URT-32) Tel (202) 426-0080 Contract GA-11-0014  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Sept. 1983 COMPLETION DATE: Aug. 1984  
 TOTAL FUNDS: \$84,341  
 ACKNOWLEDGMENT: UMTA

**23 384947****COOPERATIVE INITIATIVES IN TRANSIT LABOR: MANAGEMENT RELATIONSHIPS**

To analyze various aspects of cooperative processes in transit at seven representative local systems, to describe the structure and program elements of cooperative interventions; to examine public and industry policy as it affects cooperative arrangements; to analyze examples and parameters of cooperation as reflected in labor contract agreements; to conduct an intensive on-site survey of all parties participating in cooperative programs; and include with recommendations how cooperative arrangements may be structured to be successful.

PERFORMING AGENCY: North Florida University, UMTA-FL-11-0009  
 INVESTIGATOR: Smith, JA Tel (904) 646-2860  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Meade, J (URT-33) Tel (202) 426-0080 Grant UMTA-FL-11-0009  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1983 COMPLETION DATE: Aug. 1984  
 ACKNOWLEDGMENT: UMTA

**23 384964****RESEARCH AND TRAINING**

The objective of this project is to focus on selected real world transportation problems as faced by responsible transportation officials and to solve these problems with practical approaches in the design of a transportation program. The research and training program for the current period consists of three research projects and one training activity: Pricing options for urban transportation modes; Study of the functions and responsibilities of areawide agencies in the planning and design of pedestrian access/distribution services for fully accessible transit; Potential use of alternative fuels in urban bus operations and; A training activity to implement and conduct pilot testing of the management training program for transit

PERFORMING AGENCY: Polytechnic Institute of New York  
 INVESTIGATOR: Pignataro, L Tel (212) 643-5272  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Jasper, N (UPP-30) Tel (202) 426-0081 Grant NY-11-0023  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Sept. 1979  
 TOTAL FUNDS: \$450,000

ACKNOWLEDGMENT: UMTA

**23 384982****IMPROVE TRANSIT RELIABILITY AND PRODUCTIVITY**

The transit industry has identified improved reliability as a way to provide better service and decrease operating costs. The San Francisco Municipal Railway (MUNI) has implemented a series of on and off street supervision improvement programs. This project will capitalize on MUNI's investment by developing, implementing, and evaluating more specific on-street transit line management, off-street operator supervision, operator performance evaluation, and absenteeism reduction programs.

PERFORMING AGENCY: Multisystems, Incorporated, UMTA-CA-06-0190

INVESTIGATOR: Englisher, L Tel (617) 869-5810  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Goodman, JM (URT-31) Tel (202) 426-4984

STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Oct. 1983 COMPLETION DATE: Oct. 1985  
 TOTAL FUNDS: \$169,000  
 ACKNOWLEDGMENT: UMTA

**23 384983****AN EMPIRICAL ASSESSMENT OF THE FISCAL AND ORGANIZATIONAL IMPACTS OF PART-TIME LABOR IN PUBLIC TRANSIT**

The use of part-time labor is a controversial subject in urban transit. Conflicts over this issue have catalyzed strikes at transit districts nationwide. The object of this project is to evaluate the experience of several transit systems with part-time labor. The project is designed to develop information that will assist transit agencies in more effective personnel management.

PERFORMING AGENCY: California University, Irvine, UMTA-CA-06-0187

INVESTIGATOR: Lave, C Tel (714) 865-6789  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Goodman, JM (URT-31) Tel (202) 426-4984

STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: 1983 COMPLETION DATE: 1984  
 TOTAL FUNDS: \$91,345  
 ACKNOWLEDGMENT: UMTA

**23 384985****MANAGEMENT TRAINING AND DEVELOPMENT PROGRAM FOR THE PUBLIC TRANSPORTATION INDUSTRY**

Because increasing costs, declining federal funding, and scarce local dollars for urban transit have increased the need for professional management, talented managers are essential to meet today's new challenges and to plan for the future. Shortages of trained replacements will occur due to the relatively high average age of the present generation of upper level transit managers and the certainty of their retirement in the near future. A management development program consists of three elements: 1) symposium on professional certification: to consider and discuss the desirability and means for certifying transit professionals; 2) continuing education program: to develop and present courses to improve the skills of people working in public transportation; and 3) internship program: to give students practical and meaningful training that helps prepare them for a career in transportation, and to provide transit systems with talented students. Participants for the symposium are expected to be from across the nation. Participants for the continuing education program will be from the transit industry. In the internship program most participants will be regularly enrolled, degree-seeking students of accredited institutions of higher learning. External support and participation will come from transit officials who will be acting in the advisory capacity during the project. By the end of this project, the research will have developed, tested, and refined procedures and instructional materials for continuing education programs and internship programs.

PERFORMING AGENCY: Indiana University, Bloomington  
 INVESTIGATOR: Smerk, GM Tel (802) 335-8143  
 SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Meade, JZ (URT-33) Tel (202) 426-0080 Grant IN-11-0008  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1982  
 TOTAL FUNDS: \$90,000  
 ACKNOWLEDGMENT: UMTA

**23 384986****LABOR RELATIONS TRAINING FOR URBAN MASS TRANSIT MANAGERS**

Good labor relations in the urban mass transit industry are vitally important to the efficiency of transit operations and to the provision of uninterrupted transportation service to an entire region. In spite of the labor relations problems which transit managers face, many have little training in this area. Transit operators contacted by the Center for Labor and Industrial Relations (CLIR), New York Institute of Technology, indicated a strong interest in upgrading their managers' labor relations skills. This project will develop a 36 hour labor relations course for bus transit managers. The program will include training in the legal framework of labor relations, rights and prerogatives of management, contract interpretation, handling disputes, and bargaining by objectives. Case studies and exercises, based on actual bus transit problems, will be an integral part of the program. CLIR will deliver the courses, as a pilot workshop, to a group of transit managers. The results of the workshop will be evaluated, and a complete set of training materials submitted to the Urban Mass Transportation Administration.

PERFORMING AGENCY: New York Institute of Technology  
 INVESTIGATOR: Dibble, RE Tel (516) 686-7722  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Cudahy, B (UGM-10) Tel (202) 472-2440 Grant NY-11-0028  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1982  
 TOTAL FUNDS: \$45,503  
 ACKNOWLEDGMENT: UMTA

**23 384990****FEASIBILITY OF ADOPTING QUALITY CONTROL CIRCLES FOR IMPROVING PRODUCTIVITY AND SERVICES QUALITY**

The expected end products of this project are two: 1) a be feasible to implement Quality Control (QC) Circles in Circles at WMATA in the near future; and 2) a manual of as an integral part of its management system for the mass transportation systems in general. quality of its services to users. The concept of QC Circles is based on the basic premise that productivity increase and quality improvement of products and services can be achieved through motivating shop-floor operators and supervisors at the first-line level of management, by means of training workers (training themselves through cooperating with their supervisors) to identify, analyze and solve problems through QC Circles. This approach started two decades ago in Japan and has been introduced to many organizations, private and public, in this country during the last several years. The basic approach and methodology to be used in this project are three-fold: 1) a thorough survey of the literature on cases involving the public transportation sector and other public enterprises; 2) in-depth analysis of two to three cases which have been successful in implementing QC Circles; and 3) analyzing conditions existing at WMATA, with special emphasis on its operations and maintenance activities, with a view to judging the feasibility of adopting QC Circles in WMATA.

PERFORMING AGENCY: Howard University  
 INVESTIGATOR: Vaziri, MT Tel (202) 636-7433  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Futrell, M (UGM-11) Tel (202) 426-2055 Grant DC-11-0014  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1982  
 TOTAL FUNDS: \$57,356  
 ACKNOWLEDGMENT: UMTA

**23 384994****IMPROVE URBAN MANAGEMENT SKILLS OF PUBLIC TRANSIT EMPLOYEES**

To provide a foundation of managerial skills to the training project participants upon which they can build toward enhancing both personal

career development and organizational effectiveness. This training project is designed to strengthen the capability of course participants to handle difficult management problems that are not typically considered in most management education. Examples of such problems including dealing effectively with constant media scrutiny, conducting meaningful labor negotiations with the possibility of a "blue-flu" strike, and understanding how to communicate effectively with a demanding public clientele. Working within several basic management areas, the project will seek to provide an education in the theory and state-of-the-art knowledge. The management areas are: strategic planning in the public sector, personal and organizational effectiveness, customer relations and public accountability, employee supervision and motivation, development of leadership skills, and public sector labor relations. The training project is intended to provide an intensive one-week training session and two follow-up review and evaluation sessions several weeks later.

PERFORMING AGENCY: Cleveland State University  
 INVESTIGATOR: Garrison, DF Tel (216) 687-2134 Reimann, BC Tel (216) 687-4754  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Morrison, CT (URT-32) Tel (202) 426-9274 Grant OH-11-0005  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Sept. 1981  
 TOTAL FUNDS: \$68,978  
 ACKNOWLEDGMENT: UMTA

**23 384996****BASIC SKILLS DEVELOPMENT TRAINING PROGRAM FOR TRANSIT PERSONNEL**

The Basic Skills Development Program offers individualized instruction in reading comprehension and math computations as an effort to upgrade basic skill needs of transit personnel. The training program is tailored to meet each participant's aptitude range, skill development needs, learning pace, and personal goals. The instructional approach uses audio-visual learning systems. The program is being conducted at Urban League Training Centers in Cleveland, Ohio; Los Angeles, Calif.; New York, N.Y., and Washington, D.C. in cooperation with the respective local transit agencies. The program was implemented as a short-term demo effort to assist the UL in carrying out its upward mobility initiatives and to ascertain the need for such training programs for transit industry personnel.

PERFORMING AGENCY: National Urban League, Incorporated, NY-06-2001  
 INVESTIGATOR: Johnson, NB, II Tel (212) 310-9087  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Royal, AJ (URT-32) Tel (202) 426-0080 Contract UMTA-NY-06-2001  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Sept. 1983 COMPLETION DATE: Aug. 1984  
 TOTAL FUNDS: \$250,000  
 ACKNOWLEDGMENT: UMTA

**23 384997****ABSENTEEISM REDUCTION DEMONSTRATION PROGRAM**

A multi-phased project that is designed to demonstrate and evaluate selected attendance improvement programs that may help to improve morale and productivity of transit personnel. The project establishes attendance improvement committees involving both labor and management representation to monitor absence trends, design and implement positive reinforcement or incentive programs at the various participating transit agencies. It also will test and implement a prototype attendance information system to track and analyze absence data. The demonstration effort combines under one project structure a consortium of transit labor and management committees and a core research group to document the effectiveness of the demonstrated programs and other activities deployed to combat absenteeism.

Investigation performed in cooperation with Templar Associates.

**REFERENCES:**

Review of Attendance Programs MacDorman Associates and Templar Associates, Oct. 1983

PERFORMING AGENCY: Port Authority of Allegheny County, UMTA-PA-06-0067; MacDorman (LC) and Associates  
 INVESTIGATOR: Holzer, H Tel (412) 237-7293 MacDorman, LC Tel (703) 237-8500

SPONSORING AGENCY: Urban Mass Transportation Administration;  
Port Authority of Allegheny County; Central Ohio Transit Authority;  
Metropolitan Dade County; Tri-County Metropolitan Transp District  
Oregon

RESPONSIBLE INDIVIDUAL: Royal, AJ (URT-32) Tel (202) 426-  
0080 Grant UMTA-PA-06-0067

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Sept. 1982 COMPLETION DATE: Dec. 1985

TOTAL FUNDS: \$1,200,000

ACKNOWLEDGMENT: UMTA

### 23 384998

#### EMPLOYMENT OF THE HANDICAPPED TRAINING PROGRAM

The training program was developed to address the employment-related problems and issues faced by disabled/handicapped persons. It is suitable for presentation to personnel professionals, supervisors, and/or anyone within a transit agency who may have decision-making authority for hiring or accommodating handicapped workers. The program seeks to influence attitudinal change, to stimulate interest, and to promote progress on efforts to improve employment practices and policies affecting handicapped persons. The current contract expands a demonstration effort that started in 1982.

#### REFERENCES:

Guide to Employing Handicapped Persons in the Transit Industry, Harold Russell Associates, Incorporated, UMTA-MA-06-0105-81-1, Dec. 1981

Joint Transit Industry Training Project for Employment of the Handicapped-Case Studies and Trainers' Guide, 1982

Slide Tape: Working It Out Harold Russell Associates, Inc; Urban Mass Transp Admin, 1982

PERFORMING AGENCY: Russell (Harold) Associates, Incorporated,  
MA-06-0105 MA-06-0149

INVESTIGATOR: Ballantyne, DS Tel (617) 890-2698

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Royal, AJ (URT-32) Tel (202) 426-  
0080 Contract 83-C-71228

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Sept. 1983 COMPLETION DATE: Dec. 1984

TOTAL FUNDS: \$77,000

ACKNOWLEDGMENT: UMTA

### 23 385000

#### MAINTENANCE TRAINING DEMONSTRATION

This project is designed to assist SEPTA in retraining bus maintenance workpower to provide general mechanical skills in place of a broad number of specialist categories. Training consists of a combination of classroom and on-the-job practice with evaluations geared towards pre- and post-classroom training.

PERFORMING AGENCY: Southeastern Pennsylvania Transportation  
Authority, UMTA-PA-06-0072

INVESTIGATOR: Depello, M Tel (215) 456-4659

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Morrison, CT, Jr (URT-32) Tel (202) 426-  
9274 Contract UMTA-PA-06-0072

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: July 1982 COMPLETION DATE: June 1984

TOTAL FUNDS: \$600,000

ACKNOWLEDGMENT: UMTA

### 23 385001

#### HUMAN RESOURCES MANAGEMENT DEMONSTRATION

The objective of this demonstration is to develop and demonstrate various human resources activities in cooperation with organized labor. Programs include stress management, quality circles, urban sensitivity, and labor education (capacity training). The labor education training will be tested and expanded to include first line supervisors and foremen. The model will be explored with other transit agencies for implementation industry-wide.

PERFORMING AGENCY: Miami-Dade County Transportation, UMTA-  
FL-06-0031

INVESTIGATOR: Hamm-Davis, C Tel (305) 638-6197

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Morrison, CT, Jr (URT-32) Tel (202) 426-  
9274 Contract UMTA-FL-06-0031

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: May 1982 COMPLETION DATE: May 1984

TOTAL FUNDS: \$362,159

ACKNOWLEDGMENT: UMTA

### 23 385003

#### BUS OPERATOR INSTRUCTOR TRAINING

The objective of this program is to train transit agency training personnel in the proper use of material previously developed by the AFL-CIO Appalachian Council. Training is scheduled on a regional basis and designed to promote instructional skills and distribute training materials.

#### REFERENCES:

Transit Employee Training Project, 1977-1981: Executive Summ PB82-  
174012, Dec. 1981

Transit Employee Training Project, 1977-1981: Volume 1: Main Report

Transit Employee Training Project, 1977-1981: Volume 2: Appendices to  
Main Report, PB82-174038, Dec. 1981

PERFORMING AGENCY: Transportation Safety Institute

INVESTIGATOR: Lowen, R Tel (405) 686-4824

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Morrison, CT, Jr (URT-32) Tel (202) 426-  
9274

STATUS: Active NOTICE DATE: Apr 1984

START DATE: June 1981

ACKNOWLEDGMENT: UMTA

### 23 385088

#### INTEGRATED APPLICATIONS PACKAGE DEMONSTRATIONS

The objective of this project is to demonstrate the use of selected, integrated microcomputer software for small transit operations. Applications selected for the demonstrations include: 1) driver safety records keeping, and 2) maintenance manpower staff planning. The final report will document these two demonstrations.

PERFORMING AGENCY: Barker (William G) Associates, UMTA-MA-  
06-0039

INVESTIGATOR: Barker, W Tel (817) 265-0794

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Hillegass, TJ (URT-41) Tel (202) 426-  
9271 Contract UMTA-MA-06-0039

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Feb. 1984 COMPLETION DATE: Sept. 1984

TOTAL FUNDS: \$50,000

ACKNOWLEDGMENT: UMTA

**24 369383****PERFORMANCE INDICATORS AND PEER GROUPS FOR COMPARISON OF TRANSIT PROPERTIES**

This study is a replication and extension of earlier analysis of the UMTA Section 15 Uniform System of Accounts and Records (UMTRIS)

PERFORMING AGENCY: California University, Irvine  
 INVESTIGATOR: Fielding, GJ Tel (714) 833-5448 Brenner, M Tel (714) 833-5448  
 SPONSORING AGENCY: Urban Mass Transportation Administration Contract UMTA-CA-11-0026  
 STATUS: Active NOTICE DATE: May 1984  
 START DATE: Oct. 1982  
 TOTAL FUNDS: \$84,999  
 ACKNOWLEDGMENT: California University, Irvine

**24 384917****INFORMATION DISSEMINATION**

One of the most cost-effective uses of Federal resources is to develop and provide information and technical assistance to stimulate and improve efficiency of local transit systems. This three year project will develop and provide technical assistance to local communities interested in adopting proven, innovative techniques, and will impact on the improvement of local transportation efficiency and effectiveness.

PERFORMING AGENCY: Crain and Associates, Incorporated  
 INVESTIGATOR: Winkler, A Tel (415) 949-1250  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Bautz, JA (URT-31) Tel (202) 426-4984 Contract UMTA-IT-06-0284  
 TOTAL FUNDS: \$1,200,000  
 ACKNOWLEDGMENT: UMTA

**24 384919****MBE DATA VERIFICATION STUDY**

To develop a methodology to assure that the MBE data and documentation provided by UMTA grantees in a quarterly report format is accurate, discernible, verifiable and in a format which lends itself to the reporting and recording of computerized data.

PERFORMING AGENCY: Tillman (Mason) Associates, UMTA-CA-09-9005  
 INVESTIGATOR: Ramsey, EM Tel (415) 549-0582  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Bromall, IH (UCR-10) Tel (202) 426-6371 Contract 83-C-72206  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Sept. 1983 COMPLETION DATE: July 1984  
 TOTAL FUNDS: \$98,186  
 ACKNOWLEDGMENT: UMTA

**24 384944****TRANSIT INDUSTRY MICROCOMPUTER EXCHANGE (TIME) SUPPORT CENTER**

To establish a center which disseminates information about microcomputer hardware and software which can be used by transit agencies; to maintain a mailing list of those interested in micro-computer information centers; to distribute a newsletter which will provide descriptions of software of use to transit agencies and reviews of existing software which might have application to transit planning or management functions; to test and distribute public domain software, and to document the impact of the project's accomplishments.

PERFORMING AGENCY: Rensselaer Polytechnic Institute, UMTA-NY-06-0109  
 INVESTIGATOR: Abkowitz, M Tel (518) 270-6300  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Fisher, RJ (URT-33) Tel (202) 426-9271 Grant UMTA-NY-06-0109  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1983 COMPLETION DATE: Aug. 1984  
 ACKNOWLEDGMENT: UMTA

**24 384969****DEVELOPMENT OF TRANSIT SYSTEM PRODUCTIVITY MEASURES BASED UPON SECTION 15 AND URBAN AREA ENVIRONMENTAL DATA**

The research is focused on the need for meaningful measures of transit system cost and productivity. Such measures do not appear to be presently obtainable from UMTA Section 15 transit system reporting data due to a lack of information on causal factors associated with the operating environment of each transit system. A transit operating environment is considered to include such factors as climate, economic activity, urban form, population size, etc., which exert an influence upon reported levels of transit costs and productivity. Assembly of operating environment data would be based upon published statistics pertaining to all places having transit systems contributing to the Section 15 reporting system. The potential for acquiring additional data, possibly better suited for transit system comparisons, will be tested by extracting information from transit development plans and UMTA grant applications prepared for transit systems in UMTA Region IV. Both types of transit environment data will be used to construct comparable group of transit systems. Section 15 data then will be used to develop cost and productivity norms for each peer group. Relationships of how transit cost and productivity change with increasing coverage area, fleet size, etc., also will be examined to determine rates of change, thresholds, and most efficient points or intervals. Expected outputs of the research are the transit productivity norms and relationships, trends of change that can be detected from the three years' accumulation of Section 15 data, identification of the operating environment data set, and data collection recommendations.

PERFORMING AGENCY: Florida State University, Tallahassee  
 INVESTIGATOR: Dzurik, AA Tel (904) 644-4510  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Ensrud, N (UPM-32) Tel (202) 426-9274 Grant FL-11-0007  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1982  
 TOTAL FUNDS: \$82,770  
 ACKNOWLEDGMENT: UMTA

**24 384991****EFFICIENCY AND PRODUCTIVITY STUDIES IN URBAN MASS TRANSPORTATION**

The study concentrates on the use of the Section 15 National Urban Mass Transportation Statistics (November 1981) to advance the level of knowledge in the field concerning the factors and relationships that effect the efficiency and productivity of urban mass transit systems. The emphasis of the research effort will be on those factors that require national statistics to be investigated. This project starts a third generation research effort on efficiency and productivity and focuses on 18 sets of relationships, most of them only marginally explored hitherto. This includes size of property, physical inputs, support services, maintenance expenditures, other support expenditures, employee fringe benefits, insurance expenditures, public assistance sources, system malfunctions, energy costs, accident costs, revenue analysis, employee composition, employee vs. equipment, payroll and fringe expenditures, peak and off peak relationships, revenue miles, trip lengths, and route lengths. Supplementary APTA data also will be used.

PERFORMING AGENCY: Pennsylvania University, Philadelphia  
 INVESTIGATOR: Tomazinis, AR Tel (215) 898-8481  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Ensrud, N (UPM-32) Tel (202) 426-9274 Grant PA-11-0029  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1982  
 TOTAL FUNDS: \$84,711  
 ACKNOWLEDGMENT: UMTA

**24 385004****LIFE CYCLE COSTING (LCC) INFORMATION AND EVALUATION SURVEY**

The objective of this study is to assist transit operators in the use of LCC procurement methods for the procurement of buses. The study includes a review and documentation of LCC methodologies, development of cost estimates and cost factors indicated by transit property problems which have arisen during the LCC procurement process. To date 75 letters have been forwarded to transit properties to receive LCC information.

PERFORMING AGENCY: Technology Applications, Incorporated,  
UMTA-VA-06-0112  
INVESTIGATOR: Graves, M Tel (703) 931-2000  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Asatoorian, SD (URT-21) Tel (202)  
426-8483 Contract UMTA-VA-06-0112  
STATUS: Active NOTICE DATE: Apr. 1984  
START DATE: Mar. 1983 COMPLETION DATE: Jan. 1985  
TOTAL FUNDS: \$194,000  
ACKNOWLEDGMENT: UMTA

**24 385046****PROVIDE TECHNICAL SUPPORT FOR ADMINISTRATION OF SECTION 15 REPORTING SYSTEM**

This project provides technical support to the Urban Mass Transportation Administration in administration of the Section 15 reporting system. Project activities include: (1) assistance in planning and conducting meetings of the Section 15 Reporting System Advisory Committee; (2) assistance in validating Section 15 data for the FY 1980, FY 1981, and FY 1982 reporting years; (3) assistance in planning and conducting seminars to provide an understanding of the Section 15 reporting system and uses of the data, including the series of Productivity Seminars for Senior Policy Officials and Managers held July-August 1982; (4) production of two videotapes, one for large and one for small/medium transit operators, on improving transit productivity through use of the Section 15 reporting system; (5) preparation of a Section 15 microcomputer data base and of special data summary reports, analyses, and reviews; and (6) research and documentation of the utility and application of Section 15 data and of special problems confronting the collecting and reporting of the data.

PERFORMING AGENCY: Washington Consulting Group, DC-06-0383  
INVESTIGATOR: Budin, D Tel (202) 457-6717  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Shorter, R (URT-7) Tel (202) 426-9157 Contract DTUM60-82-C-71116  
STATUS: Active NOTICE DATE: Apr. 1984  
START DATE: Oct. 1981 COMPLETION DATE: Oct. 1984  
TOTAL FUNDS: \$1,439,000  
ACKNOWLEDGMENT: UMTA

**24 385050****TRANSIT RESOURCE PRODUCTIVITY DEMONSTRATION**

The objective of this project is to develop analytical tools and inexpensive data collection techniques to enable efficient allocation of transit resources. Computer modeling is used to determine impact of fares and service changes on costs, revenues, and ridership.

PERFORMING AGENCY: Central Ohio Transit Authority, OH-06-0027  
INVESTIGATOR: Bowles, B Tel (614) 275-5800  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: McKeown, SN (URT-31) Tel (202) 426-4984 Contract OH-06-0027  
STATUS: Active NOTICE DATE: Apr. 1984  
START DATE: Oct. 1978 COMPLETION DATE: May 1985  
TOTAL FUNDS: \$940,000  
ACKNOWLEDGMENT: UMTA

**24 385052****EVALUATION OF SECTION 15 DATA BASE AND GENERATE OUTPUT RECORDS**

This project provides technical support services to the Urban Mass Transportation Administration in administering the Section 15 reporting system. Activities include: preparation of the Section 15 data and annual reports; preparation of special data sets for the Section 9 apportionments; design and implementation of Section 15 Software system improvements; training activities for transitioning data base and report production activities to the private sector; preparation of proposed revisions to Section 15 reporting requirements, definitions, forms and manuals; special Section 15-related analyses; and distribution of annual reports and other hard-copy and machine-readable Section 15 data.

**REFERENCES:**

National Urban Mass Transportation Statistics, First Annual Report, Section 15 Reporting System, Morin, SJ, May 1981

National Urban Mass Transportation Statistics, Second Annual Report, Section 15 Reporting System, Morin, SJ, June 1982

National Urban Mass Transportation Statistics, 1981 Section 15 Report, Jacobs, M, Nov. 1982

Supplement to National Urban Mass Transportation Statistics, 1981 Section 15 Report, Jacobs, M; O'Connor, R; Chen, S, July 1983

National Urban Mass Transportation Statistics, 1982 Section 15 Annual Report, Jacobs, M; O'Connor, R; Shen, S, Nov. 1983

PERFORMING AGENCY: Transportation Systems Center, MA-06-0107  
INVESTIGATOR: Jacobs, M Tel (617) 494-2660 Lyons, W  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Shorter, R (URT-7) Tel (202) 426-9157 Contract MA-06-0107  
STATUS: Active NOTICE DATE: Apr. 1984  
START DATE: Sept. 1979  
TOTAL FUNDS: \$4,370,800  
ACKNOWLEDGMENT: UMTA

**24 385069****TECHNICAL SUPPORT**

The Life Cycle Cost program is being conducted to develop a data base for transit operators to use in LCC procurement and assist them in the process.

PERFORMING AGENCY: Transportation Systems Center, UMTA-MA-06-0120(G)  
INVESTIGATOR: Comparato, T Tel (617) 837-2196  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Lopez, RA (URT-21) Contract UMTA-MA-06-0120(G) Tel (202) 426-8483  
STATUS: Active NOTICE DATE: Apr. 1984  
TOTAL FUNDS: \$250,000  
ACKNOWLEDGMENT: UMTA

**24 385070****TECHNICAL SUPPORT FOR LCC**

The Life Cycle Cost program is being conducted to develop data bases and models to be used as an aid to transit operators in calculation and analysis of the total cost of bus "ownership" at the subsystem level. Information on total costs (capital plus operating plus maintenance) associated with various subsystems will provide transit operators with important input in procurement process, resulting in more cost effective purchases. The objective will be to assist transit operators in the use and analysis of LCC.

PERFORMING AGENCY: Transportation Systems Center, UMTA-MA-06-0120(H)  
INVESTIGATOR: Aronis, P Tel (617) 484-2024  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Lopez, RA (URT-21) Contract UMTA-MA-06-0120(H) Tel (202) 426-8483  
STATUS: Active NOTICE DATE: Apr. 1984  
TOTAL FUNDS: \$400,000  
ACKNOWLEDGMENT: UMTA

**24 385105****REVIEW OF MICROCOMPUTER ACCOUNTING SYSTEMS**

This project will produce a software selection and evaluation guide that will assist small transit agencies in purchasing microcomputer accounting software. Transit agency needs and the characteristics of appropriate software will be listed. The project will conclude with a demonstration of a selected package using data from a small transit agency.

PERFORMING AGENCY: Peat, Marwick, Mitchell and Company,  
UMTA-MA-06-0039  
INVESTIGATOR: Goldman, M Tel (202) 223-9525  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Fisher, RJ (URT-41) Tel (202) 426-9271 Contract UMTA-MA-06-0039  
STATUS: Active NOTICE DATE: Apr. 1984  
START DATE: Dec. 1983 COMPLETION DATE: June 1984  
TOTAL FUNDS: \$54,000  
ACKNOWLEDGMENT: UMTA

**24 385106****TRANSIT PERFORMANCE AND PRODUCTIVITY WORKSHOP (SMALL AND MEDIUM-SIZED TRANSIT OPERATIONS)**

The Transit Performance and Productivity Workshop is designed to offer training in performance monitoring and problem-solving techniques to

## Productivity & Efficiency

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managerial, operational support staff and policy board members of small to medium-sized transit agencies. The instructional material presents methods to assess the overall efficiency and effectiveness of an operation; discusses suggested strategies for improving efforts to maximize on financial and human resources. The workshop series will be conducted as a train-the-trainer program for small groups on a regional basis via transit association meetings or invitation from a transit agency.

### REFERENCES:

Instructor's Guide and Course Syllabus Dec. 1983  
Participant's Workbook Dec. 1983

PERFORMING AGENCY: Urban Resources Consultants, Incorporated,  
DC-06-0418

INVESTIGATOR: Fountain, BR Tel (202) 223-4670

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Royal, AJ (URT-32) Tel (202) 426-0080 Contract C-72055

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Sept. 1983 COMPLETION DATE: Aug. 1985

TOTAL FUNDS: \$150,000

ACKNOWLEDGMENT: UMTA

**25 315715****PEAK-PERIOD PARKING PRICING DEMONSTRATION IN MADISON, WISCONSIN**

This is a highly "innovative" project in that a \$1.00 parking surcharge was assessed to all vehicles that enter any one of four major parking facilities in the Madison CBD during the morning peak hours (6:30-9:30 a.m.). The principal objective of the demonstration is to improve the utilization of parking spaces in the downtown area by discouraging single occupant, auto commuter trips to the CBD, thereby increasing the availability of parking spaces for midday shopping trips. Three parking lots near the fringe of the central area will be available for auto commuters to park (free) and take a shuttle bus (25¢) to the CBD, thus avoiding the downtown parking surcharge. In designing this demonstration, Madison was faced with the following problem. Auto commuters to the CBD filled up nearly all the available parking spaces to the detriment of individuals who drove to the downtown to shop during the middle of the day, but could not find a place to park. Consequently, many of these shoppers would drive to outlying retail districts.

**REFERENCES:**

Evaluation Plan: Madison Parking Pricing Demonstration Project, Parody, T, Charles River Associates, June 1979  
 Analysis and Evaluation of the Madison Before Parking Survey Parody, T, Charles River Associates, Mar. 1981  
 Implementation of a Peak-Period Pricing Strategy for CBD Parking, Parody, T, Transportation Quarterly, V38,N1,P153-169, Jan. 1984

**PERFORMING AGENCY:** Charles River Associates, Incorporated, 388.20

**INVESTIGATOR:** Parody, TE Tel (617) 266-0500

**SPONSORING AGENCY:** Transportation Systems Center

**RESPONSIBLE INDIVIDUAL:** Doxsey, L Tel (617) 494-2616

**Contract DOT-TSC-1406-20**

**STATUS:** Complete **NOTICE DATE:** Apr. 1984

**START DATE:** Dec. 1978

**TOTAL FUNDS:** \$100,000

**ACKNOWLEDGMENT:** Charles River Associates, Incorporated

**25 349146****A MODULAR APPROACH TO ON-BOARD, AUTOMATIC DATA COLLECTION SYSTEM**

The general objective of this research is to develop requirements and implementation guidelines for the use of automated on-board passenger/fare information collection systems. The system hardware should be constructed on a modular basis. Depending on the complexity of information desired, the modules should include, but not be limited to: (1) basic passenger counters (e.g., treadle, infrared), (2) location detection devices (e.g., odometer, signposts), (3) fare category counter (e.g., electronic fare-box), and (4) data storage/retrieval equipment (e.g., radio, cassette, solid state). Functional specifications for each of these systems are to be developed so that one module or component is compatible with another regardless of manufacturer. Requirements for modules or components will depend on the decisions a transit property must make, which, in turn, determine the level of detail the data collection system must make, which, in turn, determines the level of detail the data collection system must provide. The levels of detail range from systemwide information to detailed stop-by-stop information. The system should be designed so that a transit property can choose, in modular fashion, the level and type of hardware needed for the data desired.

**PERFORMING AGENCY:** Mitre Corporation

**SPONSORING AGENCY:** Urban Mass Transportation Administration

**RESPONSIBLE INDIVIDUAL:** Jencks, CF Tel (202) 334-3224

**NCTRP 39-1**

**STATUS:** Active **NOTICE DATE:** Jan. 1983

**START DATE:** Nov. 1982 **COMPLETION DATE:** June 1984

**TOTAL FUNDS:** \$150,000

**ACKNOWLEDGMENT:** National Cooperative Transit Res and Dev Program

**25 369397****FARE COLLECTION RESEARCH AND DEVELOPMENT**

This program has two components: (1) Studies in fare collection, and (2) fare collection hardware. Immediate needs which are addressed include equipment development (e.g., bill verifier, ticket vendor) to increase the reliability of existing equipment. The market for fare collection equipment

is relatively small, failing to justify manufacturer investment in R&D, and participation in UMTA programs by manufacturers may lead to possible loss of proprietary information about hardware they have developed. UMTA has turned to operators as performing agencies for its programs. It is not clear that transit properties have technical capabilities to develop an improved product and any improvements can have only marginal benefits. The goal is fare collection systems which have high reliability, lower operating and maintenance costs, and incorporate flexibility to implement alternative fare policies. New technologies based on Electronics Funds Transfer, Security-Identification, and microprocessors look promising. Solid state equipment relying less on electro-mechanical components such as in BART and WMATA fare collection systems is desirable.

Participants in current program include Illinois Central Gulf Railroad (\$200,000), Port Authority Transit Corp (\$100,000), Chicago Transit Authority (\$250,000), and Transportation Systems Center (\$469,000).

**PERFORMING AGENCY:** Urban Mass Transportation Administration

**SPONSORING AGENCY:** Urban Mass Transportation Administration

**RESPONSIBLE INDIVIDUAL:** Spenser, P Tel (202) 426-0090

**STATUS:** Active **NOTICE DATE:** May 1984

**TOTAL FUNDS:** \$1,019,000

**ACKNOWLEDGMENT:** UMTA

**25 372973****FARE COLLECTION PROBLEMS AND SOLUTIONS**

The transit industry needs solutions to the problems of handling and securing paper currency because these problems will increase as fares continue to rise. This research will be accomplished by completing the following tasks: Task 1-Identify U.S. transit systems that collect large quantities of paper currency in on-board fare collection equipment. Task 2-Examine the strategies used by these transit systems to collect, handle, count, and secure dollar fares. Identify problems and solutions including measures used to discourage or prohibit passengers from paying fares with paper currency. Task 3-Examine state-of-the-art farebox technology for handling paper currency including documentation of transit system experience. Task 4-Examine the European experience of handling fare collection off buses by encouraging the use of tokens, tickets, passes, and other strategies. Task 5-Develop recommendations and solutions to the problems associated with collecting fares of one dollar or more on buses in the United States.

Currently being conducted by the UMTA Office of Bus technology is a comprehensive study of dollar-bill fare collection problems in bus operations. The foregoing study description will, therefore, be limited to special problems in rail systems, building on the current UMTA work as appropriate

**PERFORMING AGENCY:** Mitre Corporation

**INVESTIGATOR:** Deibel, L Tel (703) 883-6824

**SPONSORING AGENCY:** Urban Mass Transportation Administration NCTRP 60-1

**STATUS:** Active **NOTICE DATE:** May 1984

**START DATE:** Dec 1983 **COMPLETION DATE:** Nov 1984

**ACKNOWLEDGMENT:** National Cooperative Transit Res & Devel Program

**25 372988****LOS ANGELES FARE REDUCTION STUDY**

This study is examining the distributional consequences (tax and benefit incidence) associated with the 1982 fare reduction of the Southern California Rapid Transit District (SCRTD). In 1980, Los Angeles County voters approved a 1/4 of 1% sales and use tax for public transit improvements. Part of these tax revenues are being used to hold SCRTD's base fare at 50 cent, a reduction from the previous 85 cent fare.

**PERFORMING AGENCY:** Charles River Associates, Incorporated, 495.39

**INVESTIGATOR:** Lovely, ME Tel (617) 266-0500

**SPONSORING AGENCY:** Transportation Systems Center Contract 1757-39

**STATUS:** Active **NOTICE DATE:** May 1983

**START DATE:** Dec. 1982 **COMPLETION DATE:** Feb. 1984

**TOTAL FUNDS:** \$60,000

**ACKNOWLEDGMENT:** Charles River Associates, Incorporated



25 384925

## SUPPORT FOR TRANSIT PRICING AND FINANCING

This project will develop two microcomputer software packages based on innovative transit pricing or management techniques previously tested through the Service and Management demonstration (SMD) program. In addition, a series of seminars/workshops in transit financial planning will be developed for presentation to transit operators and planners. This project supports disseminating up-to-date methods in transit management and pricing through courses designed to give operators and planners access to current SMD findings and computer software to allow direct application of these techniques at the individual transit system level.

PERFORMING AGENCY: Technology Research and Analysis Corporation, UMTA-VA-06-0102

INVESTIGATOR: Yen, T Tel (703) 522-2440

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: McKeown, SN (URT-31) Tel (202) 426-4984

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: June 1983 COMPLETION DATE: Dec. 1984

TOTAL FUNDS: \$180,000

ACKNOWLEDGMENT: UMTA

25 384926

## SELF-SERVICE FARE COLLECTION AND AUTOMATIC FARE BILLING DEMONSTRATION DESIGN

This project will continue the demonstrations implemented under the Flexible Fares Program (FFP) in the areas of self-service fare collection (SSFC) and automated transit fare billing. In addition, exemplary demonstrations in these areas will be developed and technical assistance provided to transit systems needing information or special support in pursuing similar programs.

### REFERENCES:

Self-Service Fare Collection, Volumes 1-4

Self-Service Fare Collection: Canadian Experience and U.S. Implications, Mitre Corporation, Apr. 1982

Self-Service Fare Collection and Automated Transit Fare Billing Demonstration Design, Mitre Corporation, Sept. 1982

PERFORMING AGENCY: Mitre Corporation, UMTA-VA-06-0099

INVESTIGATOR: Deira, L Tel (703) 883-6910

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: McKeown, SN (URT-31) Tel (202) 426-4984

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Sept. 1979 COMPLETION DATE: June 1985

TOTAL FUNDS: \$906,377

ACKNOWLEDGMENT: UMTA

25 384954

## AUTOMATIC PASSENGER COUNTER/FAREBOX INTEGRATION

This activity will involve development, test and evaluation of automatic passenger counters and registering fareboxes on 50 buses. Installations will include necessary equipment and software to collect, transmit and produce an integrated passenger/revenue report. The goal is more ridership and fare information than can be produced by individual counters and fareboxes. To be used as an analytical tool for evaluating proposed service changes and as a marketing tool in determining costs.

PERFORMING AGENCY: Metropolitan Atlanta Rapid Transit Authority, UMTA-GA-06-0019

INVESTIGATOR: Johnson, A Tel (404) 586-5341

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483 Contract UMTA-GA-06-0019

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: 1983

ACKNOWLEDGMENT: UMTA

25 384977

## PASSENGER COUNTER EQUIPMENT TEST

Develop, install and evaluate equipment needed to interface passenger counter system with registering farebox. Evaluate ultrasonic passenger

counting sensors with infrared sensors. The combined data will be stored in the passenger counter memory. It will be useful in determining bus route structure and in reporting Section 15 data. The Automatic Passenger Counter (APC) system will be tested by Kalamazoo Metro.

PERFORMING AGENCY: Michigan Department of Transportation, UMTA-MI-06-0042

INVESTIGATOR: Richard, C Tel (517) 322-1090

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Izumi, G (URT-22) Tel (202) 426-8483

STATUS: Active NOTICE DATE: Apr. 1984

ACKNOWLEDGMENT: UMTA

25 385047

## FARE AND SERVICE DEMONSTRATION DESIGN AND RESOURCE CENTER

The purpose of this program is to design and develop management plans for demonstrations—testing differential time-of-day and distance-based fares—and to establish a Transit Pricing Resource Center offering telephone and onsite technical assistance on pricing issues.

PERFORMING AGENCY: Ecosometrics, Incorporated, MD-06-0093

INVESTIGATOR: Knapp, S Tel (301) 652-2414

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: McKeown, SN (URT-31) Tel (202) 426-4984 Contract MD-06-0093

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Sept. 1982 COMPLETION DATE: Sept 1985

TOTAL FUNDS: \$300,078

ACKNOWLEDGMENT: UMTA

25 385048

## AUTOMATED TRANSIT FARE BILLING SYSTEM

This demonstration is to test the viability and public acceptance of an automated fare billing system adapted for general use in a mass transit system. Individual transit users may apply for and be issued a transit "credit card" which is inserted into an onboard reader. Monthly billings are sent to users.

PERFORMING AGENCY: Merrimack Valley Regional Transit Authority, MA-06-0147

INVESTIGATOR: Wong, X Tel (617) 374-0195

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: McKeown, SN (URT-31) Tel (202) 426-4984 Contract MA-06-0147

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Sept. 1982 COMPLETION DATE: Sept. 1984

TOTAL FUNDS: \$416,557

ACKNOWLEDGMENT: UMTA

25 385054

## IMPROVED TURNSTILE

Develop, test and evaluate improved turnstile with standard component specifications including magnetic reader/flashpass. Rail transit operators that utilize turnstiles as the primary means for fare collection have limited flexibility for changing fare levels or structure. Passengers are inconvenienced with basically a single fare media. A number of these operators are attempting to extend the capabilities of their turnstiles with component retrofits. This work will determine a consensus amongst operators, develop and apply standard component specifications.

PERFORMING AGENCY: Southeastern Pennsylvania Transportation Authority

INVESTIGATOR: Lawrence, W Tel (215) 456-4269

SPONSORING AGENCY: Urban Mass Transportation Administration Contract PA-06-0080

RESPONSIBLE INDIVIDUAL: McKeown, SN (URT-31) Tel (202) 426-4984

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Sept. 1982 COMPLETION DATE: May 1984

TOTAL FUNDS: \$225,000

ACKNOWLEDGMENT: UMTA

25 385055

## CTA PASS READER

Develop, test and evaluate an improved slide-thru, magnetic-card pass reader system. The slide-thru magnetic-card system introduced by the MBTA has not performed as well as expected. This activity will take

advantage of recent advances in electronics and utilize off-the-shelf programmable equipment to develop an improved version of the MBTA system. Internal design will enhance the security of the system. The system will be developed in three stages: stand-alone units; interconnected system; and centrally controlled system.

PERFORMING AGENCY: Chicago Transit Authority  
 INVESTIGATOR: O'Connor, J Tel (312) 664-7200 x4030  
 SPONSORING AGENCY: Urban Mass Transportation  
 Administration Contract IL-06-0049  
 STATUS: Active NOTICE DATE: Apr. 1984  
 TOTAL FUNDS: \$250,000  
 ACKNOWLEDGMENT: UMTA

**25 385057****FARE COLLECTION MONITORING AND AUDITING SYSTEM**

This project is to develop and implement an automated, centralized data collection system for use with fare collection equipment. The MTA-Baltimore, Maryland will perform the following tasks: (1) Design the system, including hardware, software and interface requirements. (2) Procure standard computer equipment and communications hardware, and manufacture custom interface equipment to interconnect the system. (3) Install equipment, including central computer at the Operations Control Center and individual station equipment at none passenger stations, and interconnect to MTA's existing communications equipment. (4) Perform field tests and evaluation to verify and document that equipment operated properly and in accordance with specification. The proposed monitoring and auditing system will provide detailed maintenance reporting to aid in maintenance problem identification and in establishing trends. The system will continuously monitor each piece of equipment on the fare collection system. Any failure of equipment or change in status will be automatically relayed to Central Control where a message will be printed out.

PERFORMING AGENCY: Maryland Department of Transportation,  
 MD-06-0091  
 INVESTIGATOR: Kirkpatrick, BK Tel (301) 383-6038  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Kulyk, W (URT-10) Tel (202) 426-  
 0090 Contract MD-06-0091  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Jan. 1982 COMPLETION DATE: July 1984  
 TOTAL FUNDS: \$300,000  
 ACKNOWLEDGMENT: UMTA

**25 385061****ICG BILL VALIDATOR**

Develop more reliable and efficient one and five dollar bill validator for automated ticket vending equipment. The experience that rail transit operators have had with bill validators has been substantially less than optimum. An earlier study at ICG showed the bill validator reliability to be 1000 transactions between failures. This work will aim to increase that figure by at least a factor of two.

PERFORMING AGENCY: Illinois Central Gulf Railroad  
 INVESTIGATOR: Keeling, RR Tel (312) 565-1600 x3452  
 SPONSORING AGENCY: Urban Mass Transportation  
 Administration Contract IL-06-0052  
 STATUS: Active NOTICE DATE: Apr. 1984  
 TOTAL FUNDS: \$262,207  
 ACKNOWLEDGMENT: UMTA

**25 385068****FARE COLLECTION ACTIVITY**

The national increase in dollar bill usage is impacting fare collection systems. Added costs associated with bill handling and lost revenue may be several hundred million of dollars. This project is a multi-faceted approach consisting of (a) industry coordination through the bus technology board; (b) systemwide assessment to identify and quantify major problems; (c) subsystem evaluation to determine baseline data; and (d) assistance in monitoring fare collection demonstration projects and studies.

PERFORMING AGENCY: Transportation Systems Center, UMTA-MA-  
 06-0120(D)  
 INVESTIGATOR: Koziol, T Tel (617) 494-2546  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: DeMarco, VR (UFM-10) Contract  
 UMTA-MA-06-0120(D) Tel (202) 426-4035  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Jan. 1983  
 ACKNOWLEDGMENT: UMTA

**25 385078****DOLLAR BILL HANDLING**

The objective is to reduce dollar bill handling costs for fare collection and processing in Detroit by improving farebox equipment reliability and reducing fare revenue processing cost. This will involve purchase, test and evaluation of fare equipment capable of \$1 bill handling to reduce jamming and stack \$1 bills separately from coins. Improved revenue processing, security and accountability will be achieved. Bus fares nationally are at or approaching \$1. Fareboxes in use are designed for coins only. Present dollar handling fareboxes are experiencing poor equipment reliability and low bill capacities.

PERFORMING AGENCY: Michigan Department of Transportation,  
 UMTA-MI-06-0041  
 INVESTIGATOR: Boctor, K Tel (517) 322-1601  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: DeMarco, VR (UFM-10) Contract  
 UMTA-MI-06-0041 Tel (202) 426-4035  
 STATUS: Active NOTICE DATE: Apr. 1984  
 ACKNOWLEDGMENT: UMTA

**25 385104****FARE COLLECTION DATA RETRIEVAL**

Increase farebox security and accountability by reducing farebox data processing time. Reduce cost and increase accuracy of collecting and processing fare collection data. This will involve installation test and evaluation in bus revenue service of two alternative revenue data collection systems. Two groups of 15 buses will be equipped with data collection systems which connect directly with the bus farebox; the equipment maintains total of money, tokens and transfer data electronically for a microcomputer. A major deterrent to theft is farebox accountability. Also, increased passenger data reporting requirements have been placed on grantees under Section 15.

PERFORMING AGENCY: Massachusetts Bay Transportation Authority,  
 UMTA-MA-06-0160  
 INVESTIGATOR: DeAngelis, M Tel (617) 722-3351  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: DeMarco, VR (UFM-10) Contract  
 UMTA-MA-06-0160 Tel (202) 426-4035  
 STATUS: Active NOTICE DATE: Apr. 1984  
 TOTAL FUNDS: \$38,400  
 ACKNOWLEDGMENT: UMTA

26 385002

**DOOR PANEL SENSOR IMPROVEMENT PROGRAM**

The objective of this program is to improve the reliability of existing New York railcar door sensors through development and testing of new door sensor designs. The scope of the program includes investigating previous work in door sensor improvements and develop a door sensor specification; develop a list of promising potential improved door sensors that may be available from suppliers; test and evaluate potential improved sensors; retrofit several New York railcars and conduct limited field tests on the sensors to collect and analyze performance data on the door sensors; and use this information as a basis to improve reliability and maintenance of door sensors.

PERFORMING AGENCY: Metropolitan Transportation Authority,  
UMTA-NY-06-0101

INVESTIGATOR: Rossmly, M Tel (212) 878-7256

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Sing, FL (URT-12) Tel (202) 426-0090

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Mar. 1984 COMPLETION DATE: Nov. 1985

TOTAL FUNDS: \$375,000

ACKNOWLEDGMENT: UMTA

27 384933

**FACTORS AFFECTING THE INCIDENCE AND PERCEPTION OF BUS CRIME IN LOS ANGELES**

To document public exposure to crime in bus transit modes and elaborate on three factors affecting both actual exposure to incidents and the perception of danger in selecting bus transit. The factors are the defensibility of space, identification with bus travel, and experience with bus travel. A random telephone survey of one thousand households in west central Los Angeles will be conducted using the method of stratification random digit dialing, in order to document the actual incidence of crime on buses and on route to and from bus stops, as well as to examine public perception of safety during bus travel. An analysis will be conducted both on general characteristics of the sample and sub-population who have been exposed to bus crimes.

PERFORMING AGENCY: California University, Los Angeles, UMTA-CA-06-0195

INVESTIGATOR: Levine, N Tel (213) 825-8561 Wachs, M

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Meade, JZ (URT-33) Tel (202) 426-0080 Grant UMTA-CA-06-0195

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: July 1983 COMPLETION DATE: Nov. 1984

TOTAL FUNDS: \$84,187

ACKNOWLEDGMENT: UMTA

27 385019

**METROPOLITAN DADE COUNTY TRANSIT ANTI-CRIME DEMONSTATION**

The purpose of this project is to reduce crime on and around the bus system by utilizing undercover police officers as decoys equipped with electronic surveillance equipment; increase rider perception of security by establishment of a 24-hour crime hotline, combined with public awareness programs through the media; and, to develop procedures for policing the Dade County transportation system.

PERFORMING AGENCY: Metropolitan Dade County, UMTA-FL-06-0025

INVESTIGATOR: Deluca, A Tel (305) 638-5751

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Cooper, GR (URT-6) Tel (202) 426-2896 Contract UMTA-FL-06-0025

STATUS: Inactive NOTICE DATE: Apr. 1984

START DATE: June 1982

TOTAL FUNDS: \$730,000

ACKNOWLEDGMENT: UMTA

28 372985

**TRANSIT MARKET SEGMENTATION STUDY**

By means of an opinion survey, the objective of the study is to determine the size and characteristics of the consumer groups representing current riders and those people offering the greatest potential for becoming transit users. The study also will identify the factors which inhibit increased use of public transportation by these groups, and identify the motivating appeals that would overcome these inhibiting factors within each market segment.

PERFORMING AGENCY: Washington Metropolitan Area Transit Authority, X-92010

INVESTIGATOR: Fowler, PL Tel (202) 637-1327 Contract

STATUS: Programmed NOTICE DATE: May 1983

START DATE: Apr. 1983 COMPLETION DATE: July 1983

TOTAL FUNDS: \$70,000

ACKNOWLEDGMENT: Washington Metropolitan Area Transit Authority

28 384940

**EQUITY AND SENSITIVITY: ELEMENTS TO IMPROVE RIDERSHIP AND MARKETING FOR LOW INCOME CITIZENS**

To design, field test and implement an instrument that will generate data relative to the attitudes and self-perception of inner city ridership. A comprehensive review will be conducted of the regular and special services and practices which are offered to inner city low income riders. The project effort will also investigate the impact of increased suburbia routing and its relationship to quality of services for urban dwellers and develop simple instructional modules which will increase bus driver's ability to deal sensitively with and/or assist elderly, handicapped and intoxicated riders. Information tools and techniques will be designed and developed to aid riders in becoming more cooperative and tolerant with Tidewater Regional Transit (TRT) and its drivers. Finally the research effort will develop a set of recommendations and assist TRT in creating mini-services which will allow elderly and handicapped persons to meet more of their needs.

PERFORMING AGENCY: Norfolk State University, UMTA-VA-11-0014

INVESTIGATOR: Smith, M Tel (804) 623-8248

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Takai, H (URT-33) Tel (202) 426-4018 Grant UMTA-VA-11-0014

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: July 1983 COMPLETION DATE: Sept. 1984

ACKNOWLEDGMENT: UMTA

28 384948

**ASSESSMENT OF TRANSIT USER MARKETING TOOLS AND TECHNIQUES**

To help address a lack of information by identifying and gathering all available transit information tools and aids, both public and private; determining the availability and locations of all available transit tools and aids; determining travel behavior of transit users in the public and private sector by using travel diaries and random sample techniques; analyzing how the elderly, handicapped, and general public view existing transit aids and tools in the public and private sector; utilizing a training and marketing campaign to educate the elderly, handicapped, and general public on how to better access the public and private transportation systems via training workshops, pamphlets, and media campaign; measuring the effects of training and promotional campaign on the elderly and handicapped's use of specialized services; identifying some variables which affect the elderly and handicapped and general public use and non-use of public and specialized transportation; and collecting data which can be used to develop appropriate and usable information aids and tools.

PERFORMING AGENCY: Morgan State University, UMTA-MD-11-0006

INVESTIGATOR: Abrams, W Tel (301) 444-3362

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Arrillaga, B (URT-33) Tel (202) 426-4948 Grant UMTA-MD-11-0006

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: July 1983 COMPLETION DATE: Aug. 1984

ACKNOWLEDGMENT: UMTA

28 384992

**A PROJECT DESIGNED TO INCREASE LEVEL OF PUBLIC TRANSIT PATRONAGE AMONG SPECIALIZED GROUPS**

The emergence of public transportation and its decline can be attributed to a number of interdependent causes. The urban population continues to increase outside central cities in which public transportation systems are located. Suburban living in the United States is largely automobile oriented because housing and population densities are low. Because of low population density and wide dispersion of origins and destinations, transit systems normally cannot operate profitably. Added to these causes has been the absence of innovative management and marketing strategies to induce greater patronage. The people most affected by these problems are special users—the poor, the young, the old, and the handicapped. There is need to assess current users and potential users of public transit among specialized groups and to develop management and marketing techniques for increasing the level of ridership among the mobility disadvantaged. This project focuses on transit management as it relates to marketing (promotion, etc.). It is designed to stimulate ridership and to improve the image of public transit generally through a marketing program tailored to the needs of special users. The objectives of the project are: (1) to examine existing marketing techniques in urban areas which are potentially applicable to increasing public transit ridership and revenues; (2) to analyze, through market research, the mobility wants, needs, and preferences of disadvantaged groups and potential users; (3) to develop techniques for increasing the measurable ridership and public awareness among special users, namely the transportation disadvantaged; and (4) to assess the impact of these marketing techniques and to develop data that will provide specific guidance to transit professionals for effectively incorporating marketing into planning and decision-making. There is a strong demand for effective marketing management of public transit to encourage patronage, thereby increasing ridership at the local level and conserving energy. The proposed project addresses this need.

PERFORMING AGENCY: Texas Southern University

INVESTIGATOR: Lede, NW Tel (713) 527-7282

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Adams, RW (URT-42) Tel (202) 426-4267 Grant TX-11-0014

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: July 1982

TOTAL FUNDS: \$122,662

ACKNOWLEDGMENT: UMTA

28 385049

**RATIONALIZING SERVICE AND FARE POLICIES**

This project evaluates the potential of increasing transit ridership as a means of rationalizing fare and service policies in the U.S. by performing and in-depth disaggregate case study analysis of the New Jersey Transit Corporation transit system.

PERFORMING AGENCY: Rutgers University, New Brunswick, NJ-06-0017

INVESTIGATOR: Pucher, JR Tel (201) 932-3812

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: McKeown, SN (URT-31) Tel (202) 426-4984 Contract NJ-06-0017

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Dec. 1982

TOTAL FUNDS: \$84,771

ACKNOWLEDGMENT: UMTA

29 369388

**ERIE COMPUTERIZED RIDER INFORMATION SYSTEM DEMONSTRATION**

This demonstration involves the installation of an automatic voice response system, and later an automatic vehicle monitoring system, that will provide individuals with the expected arrival times of the next two buses at a given bus stop. The main objectives of the system are to increase transit ridership and net revenue by automatically providing Erie Metropolitan Transit Authority (EMTA) users with bus schedule and status information using regular telephones. The first phase of the project is scheduled to begin in early 1983 when the automatic voice response (AVR) system starts operating to provide callers with regular transit schedule information. The second phase will begin about one year later and involves using an automatic vehicle (AVM) system to provide the computer, and thus the transit user, with real time information on the location and arrival times of all buses in operation.

**REFERENCES:**

Erie Computerized Rider Information System Demonstration: Data Collection Plan, Parody, TE, Dec. 1981

**PERFORMING AGENCY:** Charles River Associates, Incorporated, 495.36

**INVESTIGATOR:** Parody, TE Tel (617) 266-0500

**SPONSORING AGENCY:** Transportation Systems Center; Urban Mass Transportation Administration Contract DOT-TSC-1757-36

**STATUS:** Active **NOTICE DATE:** Nov. 1982

**START DATE:** Sept. 1981 **COMPLETION DATE:** June 1984

**TOTAL FUNDS:** \$100,000

**ACKNOWLEDGMENT:** Charles River Associates, Incorporated

29 372972

**TRAFFIC CONTROL AND REGULATION AT TRANSIT STOPS**

The objective of this study is, through surveys and interviews, to develop a consensus of recommended practices for signing at bus stops. The practices would also address the use of curb and pavement markings. Signing practices would be developed for different conditions such as: (1) Coordination of bus stop signs with traffic control signs, (2) Far and near side stop in urban areas, (3) Minimum signing for residential streets, (4) Signing in rural and suburban areas without curbs or shoulders, (5) Coordination with bike paths on streets, (6) Use of curb painting, (7) Part-time bus stops-restricted parking only part of the day, and (8) Coordination with exclusive bus lanes. This synthesis should be derived through a joint effort by traffic engineer and transit management. It should not necessarily address the need for a uniform bus stop sign as most transit systems have their own unique sign, which provides for system recognition.

**PERFORMING AGENCY:** Rankin (WW), 6307 E. Halbort Road

**INVESTIGATOR:** Rankin, WW Tel (301) 229-3673

**SPONSORING AGENCY:** Urban Mass Transportation Administration  
**RESPONSIBLE INDIVIDUAL:** Copas, T Tel (202) 334-3242 NCTR  
60-1, TS-6

**STATUS:** Active **NOTICE DATE:** May 1984

**START DATE:** Jan. 1984 **COMPLETION DATE:** Dec. 1984

**TOTAL FUNDS:** \$45,000

**ACKNOWLEDGMENT:** National Cooperative Transit Res & Devel Program

29 372976

**PASSENGER INFORMATION SYSTEMS FOR TRANSIT TRANSFER FACILITIES**

Currently, no single standard set of policies, guidelines, or principles are available to provide terminal architects/designers with guidance for signing and information systems for intermodal transfer facilities. A uniform set of passenger information systems and policies can yield significant benefits to virtually millions of terminal systems users and significantly reduce the cost associated with designing these systems. Research should be conducted to identify and categorize the various types of passenger information systems currently deployed in intermodal transfer facilities in the United States. A comparative evaluation of the effectiveness of the systems should be conducted. Standards for guidance systems, real time data systems, and general information systems should be inventoried, unified, and enhanced to aid the terminal user and eliminate the anxiety associated with decisionmaking in an unfamiliar environment. Specific questions that should be addressed include: (1) What alternative communication systems are available to identify loading areas for various routes? (2) What alternative effective communication systems are available for identifying loading areas for multiple routes using the same loading areas? (3) Can communication systems effectively manage pedestrian traffic in loading areas? (4) What alternative techniques are available to display timetables and routes structures? Which of these appear to be the most effective communication device? (5) What are the trade-offs between automated communications systems vs. person-to-person communications in terms of cost-effectiveness and communications effectiveness?

**PERFORMING AGENCY:** Fruin (JJ)

**INVESTIGATOR:**

**SPONSORING AGENCY:** Urban Mass Transportation Administration  
**RESPONSIBLE INDIVIDUAL:** Copas, T Tel (202) 334-3242 NCTR  
60-1, TS-8

**STATUS:** Active **NOTICE DATE:** May 1984

**START DATE:** Nov. 1983 **COMPLETION DATE:** Oct. 1984

**TOTAL FUNDS:** \$45,000

**ACKNOWLEDGMENT:** National Cooperative Transit Res & Devel Program

**31 369378**

**APPROPRIATE TRANSIT TECHNOLOGY FOR URBAN AREAS IN DEVELOPING NATIONS (PART OF "TRANSPORTATION ENGINEERING RESEARCH PROBLEMS IN COSTA RICA")**

Analysis of urban transit technologies and operating strategies (including paratransit) available and appropriate for developing nations which have few or no petroleum resources, plentiful electricity, and the type of urban and institutional structures often found in such nations. Includes study of travel patterns, traffic facilities available, costs of changing to different technologies or strategies, benefits received, and recommendation for implementation.

PERFORMING AGENCY: California University, Berkeley; Universidad de Costa Rica

INVESTIGATOR: Homburger, WS Tel (415) 642-3558

SPONSORING AGENCY: Ministry of Public Works, Costa Rica Contract 611731-59721

STATUS: Active NOTICE DATE: Oct. 1982

START DATE: Apr. 1982 COMPLETION DATE: Dec. 1983

ACKNOWLEDGMENT: California University, Berkeley

**31 369380**

**FEASIBILITY OF UTILIZING EXISTING RAILROAD RIGHT-OF-WAY FOR TRANSIT CORRIDORS IN URBAN AREAS**

The research will identify and investigate U.S. transit projects which utilize railroad rights-of-way for public transportation purposes. The investigation will assess and summarize the institutional, jurisdictional and legal considerations associated with the joint use of rail facilities. Construction and operational problems will be considered and outlined in a final report. Both the practical and technical feasibility of utilizing existing rail right-of-way for transit projects will be addressed and presented in the final research document.

PERFORMING AGENCY: Texas Transportation Institute, 2074

INVESTIGATOR: Peterson, RL Tel (713) 845-1535 Porterfield, CJ

SPONSORING AGENCY: Texas State Department of Highways & Public Transp

STATUS: Programmed NOTICE DATE: Nov. 1982

START DATE: Oct. 1982 COMPLETION DATE: Aug. 1983

TOTAL FUNDS: \$48,000

ACKNOWLEDGMENT: Texas Transportation Institute

**31 369384**

**SMALL CITY TRANSIT STRATEGIES UNDER THE NEW FEDERALISM**

Transit operators in small cities, where the tax base is not large and auto congestion is not a major factor in travel mode choice, face a set of problems and opportunities under reduced federal subsidies that are different from large city operators. This project has three main tasks. (1) Identify sources of additional revenue. (2) Examine the potential for improved productivity and its relation to subsidy formulas. (3) Develop relationships between management's supply-of-service

PERFORMING AGENCY: Purdue University, 6275

INVESTIGATOR: Fricker, JD Tel (317) 494-2205 Sinha, KC Shanteau, RM

SPONSORING AGENCY: Urban Mass Transportation Administration Grant IN-11-0007

STATUS: Active NOTICE DATE: Nov. 1982

START DATE: Sept. 1982 COMPLETION DATE: Aug. 1983

TOTAL FUNDS: \$84,981

ACKNOWLEDGMENT: Purdue University

**31 384981**

**PORT AUTHORITY OF ALLEGHENY COUNTY'S EAST BUSWAY OPERATION**

Because of the Busway's moderate construction cost relative to other transit systems, it is important to measure the impact of the busway in order to compare the busway benefits with benefits achieved by other more expensive transit facilities. This project is an evaluation of the Port

Authority of Allegheny County's (PAT) new 6.8 mile East Busway serving Pittsburgh and Allegheny County. The project is different from previous exclusive bus lane projects because the higher quality facility comes closer than other busways to a rapid transit system.

PERFORMING AGENCY: Transportation Systems Center, UMTA-PA-06-0081

INVESTIGATOR: Koffman, D Tel (415) 949-1472

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Goodman, JM (URT-31) Tel (202) 426-4984

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Mar. 1983 COMPLETION DATE: 1985

TOTAL FUNDS: \$120,000

ACKNOWLEDGMENT: UMTA

**31 384989**

**AN EVALUATION OF THE IMPACT OF A "PUBLICO" TERMINAL FACILITY ON URBAN TRANSPORTATION**

The "Publico" service operated by private groups of drivers constitutes the major element of the public transportation system in the Commonwealth of Puerto Rico. Most "Publicos" operate from street terminals located at the heart of the central business district of each town. In order to alleviate the traffic problems and to contribute to a better coordinated public transportation system, Urban areas have built and have plans to build centralized "Publico" terminal facilities. The principal purpose of this study is to quantify the impact of constructing a "Publico" terminal facility by evaluating the level of service rendered by the "Publico" system. The point of reference will be the Municipality of Mayaguez, since a "Publico" terminal is presently under construction, and it is scheduled for completion in early 1983. The study will determine if the construction of the terminal facility will have an effect on passengers per route, service frequency, passenger volumes, waiting times, and travel times. A route ridership model, that could be utilized to evaluate the impact on "Publico" ridership of route level changes, also will be developed. The amount of reduction or increase in congestion will be quantified by performing an intersection delay study at several key intersections. Public opinion surveys will be used to make recommendations as to the design, operation, and improvements of "Publico" terminals. The result of the study will be the development of models, patterns, and guidelines through which transportation agencies can base decisions on the establishment of future "Publico" terminals.

PERFORMING AGENCY: Puerto Rico University, Mayaguez

INVESTIGATOR: Luyanda, F Tel (809) 832-4040

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Meade, JZ (URT-32) Tel (202) 426-0080 Grant PR-11-0003

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: July 1982

TOTAL FUNDS: \$80,865

ACKNOWLEDGMENT: UMTA

**31 385018**

**I-66 EVALUATION**

The objectives of this project are to evaluate the impact of I-66 high occupancy vehicle (HOV) rules on mode split generation and use of HOVs in I-66 corridor; collect data on the changes in mode choice; and develop a modal split model.

PERFORMING AGENCY: Transportation Systems Center, UMTA-MA-06-0049; Metropolitan Washington Council of Governments

INVESTIGATOR: Casey, R Tel (617) 494-2213

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Goodman, JM (URT-7) Tel (202) 426-4984 Contract UMTA-DC-06-0402

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: May 1982 COMPLETION DATE: Oct. 1984

TOTAL FUNDS: \$50,000

ACKNOWLEDGMENT: UMTA

**32 369381****PARK-AND-POOL LOTS IN RURAL, NON URBANIZED AREAS**

Through a commuter survey, the personal and travel characteristics of individuals engaged in ridesharing will be determined. The demand for Park-and-Pool facilities in rural areas will be assessed along with the benefits and costs associated with the provision of the staging or parking areas. Guidelines for planning and implementing these types of High Occupancy Vehicle (HOV) treatments will be developed and presented in a final report. In addition, the relative effectiveness of rural Park-and-Pool lots, compared to urban lots will be investigated in terms of annual VMT reduction and fuel conservation.

PERFORMING AGENCY: Texas Transportation Institute, 2072  
 INVESTIGATOR: Peterson, RL Tel (713) 845-1535  
 SPONSORING AGENCY: Texas State Department of Highways & Public Transp Contract 2-10-83-1072  
 STATUS: Programmed NOTICE DATE: Nov. 1982  
 START DATE: Sept. 1982 COMPLETION DATE: Aug. 1983  
 TOTAL FUNDS: \$52,000  
 ACKNOWLEDGMENT: Texas Transportation Institute

**32 369382****COMMUTER RIDESHARING: AN ANALYSIS OF SURVEY DATA AND PARK-AND-GO FACILITIES**

A survey of ridesharing commuters will identify personal and travel characteristics of individuals parking their vehicles at a Park-and-Go or Park-and-Pool Facility and traveling to their final destination by bus, carpool or vanpool. This research will include both urban and rural staging areas for rideshare activity and is an extension of previous work completed in the Fort Worth/Dallas metropolitan region during 1981-82. The results of the survey and data analysis will be documented in a final report.

PERFORMING AGENCY: Texas Transportation Institute, 205  
 INVESTIGATOR: Peterson, RL Tel (713) 845-1535 Christiansen, DL  
 SPONSORING AGENCY: Texas State Department of Highways & Public Transp Contract 2-10-74-205  
 STATUS: Active NOTICE DATE: Nov. 1982  
 START DATE: Sept. 1982 COMPLETION DATE: Aug. 1983  
 TOTAL FUNDS: \$40,000  
 ACKNOWLEDGMENT: Texas Transportation Institute

**32 369385****DISSEMINATION AND TECHNICAL ASSISTANCE FOR RSS (RIDE SHARING SYSTEM)**

In March 1982, development of the UMTA-sponsored microcomputer ridesharing matching system known as RSS was completed. Knoxville Commuter Pool is now disseminating information about RSS to ridesharing organizations throughout the country. In addition, Knoxville commuter pool will provide technical assistance to organizations wishing to use RSS as their matching system.

PERFORMING AGENCY: Knoxville Commuter Pool  
 INVESTIGATOR: Beeson, J Tel (615) 637-7433  
 SPONSORING AGENCY: Urban Mass Transportation Administration Contract TN-06-0010  
 STATUS: Active NOTICE DATE: Oct. 1982  
 START DATE: Sept. 1982 COMPLETION DATE: Sept. 1983  
 TOTAL FUNDS: \$61,000  
 ACKNOWLEDGMENT: Tennessee University, Knoxville

**32 369386****COMMUTER CLUB: AN INNOVATIVE RIDESHARING MANAGEMENT PROGRAM**

This two-year project is attempting to demonstrate that, over a relatively short time, part of the operating costs of a ridesharing program can be generated by the services it sells. To reach the demonstration goals, Knoxville Commuter Pool has established a Commuter Club that operates much like its Knox Area Vanpoolers Association operation. Members pay to join the club and, in return, receive special benefits and services. Other methods of generating revenue are also being explored.

PERFORMING AGENCY: Knoxville Commuter Pool; Department of Transportation  
 INVESTIGATOR: Beeson, J Tel (615) 637-7433

SPONSORING AGENCY: Tennessee Department of Transportation Contract 47-900-9600  
 STATUS: Active NOTICE DATE: Oct. 1982  
 START DATE: Oct. 1981 COMPLETION DATE: Sept. 1983  
 TOTAL FUNDS: \$228,000  
 ACKNOWLEDGMENT: Tennessee University, Knoxville

**32 384916****MIAMI DADE COUNTY BROKERAGE PROJECT**

This transportation brokerage demonstration is in the second year of operations. It will implement several key components of the project including participation of private carriers in the taxi-transit integration element of the demonstration. The demonstration will provide models for other large urban areas interested in improving public transportation services. Metropolitan Dade County has begun implementing several project elements and is planning to implement the remaining elements including transit/paratransit integration and the computer-assisted routing, scheduling, and dispatching system.

PERFORMING AGENCY: Metropolitan Dade County  
 INVESTIGATOR: Marsella, C Tel (305) 579-2594  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Bautz, JA (URT-31) Tel (202) 426-4984 Contract UMTA-FL-06-0023  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Apr. 1984 COMPLETION DATE: Dec 1985  
 TOTAL FUNDS: \$1,000,000  
 ACKNOWLEDGMENT: UMTA

**32 384936****THE POTENTIAL OF PRIVATE SECTOR COMMUTER CLUBS TO INCREASE PUBLIC SECTOR EFFICIENCY**

To investigate the potential of private commuter clubs serving the CBD in the Chicago area to reduce peak demand and optimal peak ridership of commuter rail. The marginal cost of peak demand and optimal peak ridership of commuter rail will be determined from operation and cost data. The stability and potential of expansion of the commuter clubs will be investigated by interviewing the organizers and operators of commuter clubs. The conditions under which an optimal number of commuters will switch from rail to commuter clubs will be analyzed through the use of existing mode split models. Policies that will create these conditions will be generated and evaluated.

PERFORMING AGENCY: Illinois University, Chicago, UMTA-IL-06-0058  
 INVESTIGATOR: Paaswell, RS Tel (317) 494-2205  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Churchman, MM (URT-33) Tel (202) 426-4984 Grant UMTA-IL-06-0058  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1983 COMPLETION DATE: Aug. 1984  
 ACKNOWLEDGMENT: UMTA

**32 384939****NEW APPROACHES TO CIRCUITRY IN RIDE SHARING: THE INDIVIDUAL TRAVEL DECISION**

To improve on earlier studies by specifying the extent to which certain factors affect circuitry, using data from a small urban area. Factors to be tested include trip length, car pool size, job category, network structure, and whether the carpool was formed by a matching service or "spontaneously". Most importantly, these analyses will be conducted with variable values assigned from the individual's perspective, not based on carpool-wide averages or totals. Furthermore, the inaccuracies in the approximation of methods of earlier studies will be examined. The result will have immediate use in a variety of applications for planning and operations. The impacts of energy shortages, changes in transportation service, and other factors that may influence ride sharing can be better quantified if the nature and magnitude of route deviation is better understood.

PERFORMING AGENCY: Purdue University, UMTA-IN-11-0010  
 INVESTIGATOR: Fricker, J Tel (317) 494-2205  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Churchman, MM (UPM-31) Tel (202) 426-4984 Grant UMTA-IN-11-0010  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1983 COMPLETION DATE: Aug. 1984



ACKNOWLEDGMENT: UMTA

**32 384970**

**TAXI REGULATION IN A FREE ENTRY MARKET: A CASE STUDY OF WASHINGTON, D.C.**

Regulatory barriers have often surfaced as the critical limitation in attempts to expand the scope of private sector participation in public transportation. While the regulation of taxicabs generally has been accepted as necessary for the public good, the taxi industry is looked upon as a provider of private transportation to a public market. The project will, through a case study approach, examine regulatory trends and regulators' willingness to encourage increased private sector participation in public transportation. Research methodology will include: (1) examination and analysis of data from files and public records; (2) identification and analysis of regulatory trends since 1970; (3) interviews with public officials and staff involved in taxi regulation; and (4) analysis of alternatives for increasing private sector participation in public transportation. The efforts of this project work will result in the formulation of specific recommendations and implementation strategies for increasing private sector participation in public transportation from the local public body's point of view.

PERFORMING AGENCY: District of Columbia University  
 INVESTIGATOR: Lyons, DL Tel (202) 727-2530  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Bruno, LA (URT-31) Tel (202) 426-4984 Grant DC-11-0015  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1982  
 TOTAL FUNDS: \$76,853  
 ACKNOWLEDGMENT: UMTA

**32 384993**

**EVALUATION OF OPTIONS FOR PRIVATE SECTOR PROVISION OF URBAN COMMUTER SERVICES**

To analyze the economic and institutional feasibility of privately provided commuter transportation alternatives, and to evaluate their potential for decreasing the costs and improving the effectiveness of peak period mass transportation services. The research will focus on privately provided commuter services which are formally organized—employer sponsored buspools and vanpools, privately operated commuter bus services, third party vanpooling and buspooling, and bus and van services sponsored and organized by public agencies. Because two or more organizations, e.g., employers, private bus operators, public sector transportation agencies, are often involved in the process of organizing, delivering, and financing such services this research project will seek to assess the viability of these organizational relationships, with particular attention to public/private sector arrangements for service provision. Six major areas bearing on the potential of privately provided commuter services will be analyzed: cost and performance, subsidization, service organization options, institutional relationships, public sector constraints/issues, and private sector constraints/issues. Policy implications of current developments in these areas will be evaluated, and those policy issues which are most critical to the future prospects of privately provided commuter services will be identified.

PERFORMING AGENCY: California University, Irvine  
 INVESTIGATOR: Teal, R Tel (714) 833-6663  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Bautz, JA (URT-31) Tel (202) 426-4984 Grant CA-11-0022  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Oct. 1981  
 TOTAL FUNDS: \$69,810  
 ACKNOWLEDGMENT: UMTA

**32 385028**

**COMMUTER EXPRESS BUS AND VANPOOL SERVICES**

The Brevard Transportation Authority (BTA), located in Melbourne, Florida, was awarded a Service and Management Demonstration grant on October 1, 1982 to expand commuter transportation services to a number of major employers within Brevard County. The project involves the phased implementation of 18 express bus routes and 28 vanpools over a 2-year demonstration period. One of the primary objectives of the project is to demonstrate the application of government assistance in establishing commuter-oriented transportation service that will achieve breakeven operation by the end of the 2-year demonstration period. In addition, the

project should demonstrate the willingness of the private sector to support the public transportation needs of the urban area.

PERFORMING AGENCY: Cambridge Systematics, Incorporated,  
 UMTA-MA-06-0049 UMTA-FL-06-0036; Brevard Transportation Authority  
 INVESTIGATOR: Atherton, T Tel (617) 354-0167  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Goodman, JM (URT-31) Tel (202) 426-4984 Contract UMTA-FL-06-0036  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Sept. 1982 COMPLETION DATE: Mar. 1985  
 TOTAL FUNDS: \$500,000  
 ACKNOWLEDGMENT: UMTA

**32 385029**

**INTERCITY BUS DEMONSTRATION**

The Florida Department of Transportation (DOT), through its District 4 office in Fort Lauderdale, is implementing inter-county express commuter bus service funded in part by a Service & Management Demonstration grant covering a 2-year demonstration period.

PERFORMING AGENCY: Cambridge Systematics, Incorporated,  
 UMTA-MA-06-0049 UMTA-FL-06-0034; Florida Department of Transportation  
 INVESTIGATOR: Wold, C Tel (617) 354-0167  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Goodman, JM (URT-31) Tel (202) 426-4984 Contract UMTA-FL-06-0034  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Sept. 1982 COMPLETION DATE: Aug. 1984  
 TOTAL FUNDS: \$220,000  
 ACKNOWLEDGMENT: UMTA

**32 385033**

**DADE COUNTY INTEGRATED TRANSIT**

A comprehensive demonstration of transportation brokerage—includes taxi regulatory revision, social service agency transportation coordination, special paratransit services, and taxi feeder operations (taxi/transit interface).

PERFORMING AGENCY: Metropolitan Dade County, FL-06-0023  
 INVESTIGATOR: Sachs, L Tel (305) 579-2593 Marsalla, C Tel (305) 579-2594  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Churchman, MM (URT-31) Tel (202) 426-4984 Contract FL-06-0023  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Sept 1981 COMPLETION DATE: Dec. 1984  
 TOTAL FUNDS: \$1,800,000  
 ACKNOWLEDGMENT: UMTA

**32 385034**

**BROKERAGE DEMONSTRATION**

A comprehensive demonstration of transportation brokerage which includes social agency coordination, paratransit service, pricing and marketing innovations, shared ride taxi development, and conventional bus improvements.

REFERENCES:  
 Transportation Brokerage Demonstration, Bridgeport, Connecticut—Case Study: The Human Service Transp Consortium, Kuzmyak, JR, July 1983

PERFORMING AGENCY: Greater Bridgeport Transit District  
 INVESTIGATOR: Reynolds, R Tel (203) 366-7070 Oram, R  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Churchman, MM (URT-31) Tel (202) 426-4984 Contract CT-06-0008  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Oct. 1979 COMPLETION DATE: Sept. 1984  
 TOTAL FUNDS: \$1,309,141  
 ACKNOWLEDGMENT: UMTA

32 385085

**MICROCOMPUTER COMMERCIAL SOFTWARE  
APPLICATIONS: HANDBOOK FOR PARATRANSIT  
PROVIDERS**

The objective of this project is to develop case studies in paratransit (demand responsive transportation) management including: 1) client file maintenance; 2) vehicle scheduling; and 3) budgeting. The study will point out how to use selected commercially available microcomputer software to manage these database processes.

PERFORMING AGENCY: Dynatrend, Incorporated, UMTA-MA-06-0039  
INVESTIGATOR: Cutler, M Tel (617) 935-3960 Harmon, L  
SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Hillegass, TJ (URT-41) Tel (202) 426-9271 Contract UMTA-MA-06-0039  
STATUS: Active NOTICE DATE: Apr. 1984  
START DATE: Feb. 1984 COMPLETION DATE: Sept. 1984  
TOTAL FUNDS: \$54,000  
ACKNOWLEDGMENT: UMTA

**33 385031**

**COORDINATION OF SCHOOL AND PUBLIC  
TRANSPORTATION SERVICES**

The South Tahoe Ground Express (STAGE) and the Lake Tahoe Unified School District (LTUSD) operate overlapping transportation systems in portions of the City of South Lake Tahoe. Direct service overlaps are to be eliminated by substituting STAGE buses for LTUSD buses, as a first step. The second step is to achieve full system coordination, including operations, purchasing, and maintenance. Douglas County (Nevada) would also be potentially included. Institutional coordination is a primary element of the project.

PERFORMING AGENCY: Crain and Associates, Incorporated, UMTA-MA-06-0049 UMTA-CA-06-0180; South Lake Tahoe, City of, California

INVESTIGATOR: Welch, B Tel (415) 327-8101

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Goodman, JM (URT-7) Tel (202) 426-4984 Contract UMTA-CA-06-0180

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Sept. 1982 COMPLETION DATE: Aug. 1984

TOTAL FUNDS: \$151,650

ACKNOWLEDGMENT: UMTA

34 333307

**TAXI BASED SPECIAL TRANSIT SERVICES**

This study will analyze the viability of taxi-based transit services for the elderly and handicapped. Data will be collected from 50 taxi systems in California which provide this type of service. The study has five major goals; (1) to conduct a comprehensive analysis of the issues involved in taxi based E&H transit; (2) to provide data on the expected performance of these systems; (3) to identify institutional constraints to increased use of taxi firms for special transit services; (4) to determine the impacts of public subsidies on taxi firms; and (5) to compare taxi involvement in special transit services with involvement in general-public service.

**REFERENCES:**

Taxi-Based Special Transit Services Teal, RF; Rooney, SB; Mortazavi, K; Goodhue, RE, Rpt. CA-06-0153, Mar. 1983, TRIS 373780

PERFORMING AGENCY: California University, Irvine

INVESTIGATOR: Teal, RF Tel (714) 833-6663

SPONSORING AGENCY: Urban Mass Transportation Administration

STATUS: Completed NOTICE DATE: Apr. 1984

START DATE: Sept. 1980

TOTAL FUNDS: \$58,562

ACKNOWLEDGMENT: California University, Irvine

34 369379

**IMPROVED MOBILITY FOR INDEPENDENT LIVING**

Develop and provide technical assistance to Independent Living Centers in selected states to identify means for improving the mobility of the disabled population served by the Independent Living Centers. Initial sites and technical assistance provided in Michigan, North Carolina, Minnesota and New Hampshire including a special workshop session to the Independent Living Centers in the Lansing, Michigan, Urbanized Area. Work covers a range of service planning and innovation including volunteer services, rental/lease approaches, and private sector financing. Interim materials for workshop and on coordination of volunteer activities and funding through the private sector. Survey design and analysis currently underway in Rochester, Minn. and Charlotte, N.C. Final Report and other material currently estimated some time in mid to late 1983.

PERFORMING AGENCY: Russell (Harold) Associates, Incorporated; Crain-Revis Associates, Incorporated

INVESTIGATOR: Ballyntyne, D Revis, JS Tel (202) 347-4150

SPONSORING AGENCY: Urban Mass Transportation Administration

STATUS: Active NOTICE DATE: Oct. 1982 COMPLETION DATE: 1983

ACKNOWLEDGMENT: Crain-Revis Associates, Incorporated

34 369387

**THE BALTIMORE AREA ELDERLY TRANSPORTATION PROJECT: AN INNOVATIVE SELF-HELP PROMOTION, TRAINING AND CURRICULUM DEVELOPMENT PROGRAM**

To develop and implement an innovative self-help educational program focusing on the transportation needs and problems of the elderly with the cooperation of the private sector, including churches. In order to have a greater impact on and improve the quality of life for the transportation disadvantaged, it is important to involve them in the planning, implementation and evaluation of a transportation research project in higher education. The present proposal is a joint venture between the University, the elderly, the public and private sectors, to improve transportation services to the elderly.

PERFORMING AGENCY: Morgan State University, Urban Gerontology Program

INVESTIGATOR: Abrams, WJ Tel (301) 444-3362

SPONSORING AGENCY: Department of Health and Human Services, Administration on Aging; Morgan State University

STATUS: Active NOTICE DATE: Nov. 1982

START DATE: Mar. 1983 COMPLETION DATE: Sept. 1984

TOTAL FUNDS: \$112,815

ACKNOWLEDGMENT: Morgan State University

34 369390

**HARTFORD REVERSE COMMUTER EVALUATION**

This project is an evaluation of Hartford's Reverse Commuter Service. First, the evaluation is assessing the distribution of systemwide transit costs and benefits among income and racial groups, and among users and nonusers. Second, it will measure the impacts of reverse commuter service on the accessibility of inner-city workers and the cost of service provision. Finally, the evaluation will examine changes in the distribution of costs and benefits due to reverse commuter service.

**REFERENCES:**

Hartford Reverse Commuter Evaluation Plan May 1981

Evaluation Plan Refocus Lovely, M, Nov. 1981

PERFORMING AGENCY: Charles River Associates, Incorporated, 495.09

INVESTIGATOR: Lovely, ME Tel (617) 266-0500

SPONSORING AGENCY: Transportation Systems Center Contract DOT-TSC-1757-09

STATUS: Active NOTICE DATE: Nov. 1982

START DATE: May 1981 COMPLETION DATE: Dec 1983

TOTAL FUNDS: \$100,000

ACKNOWLEDGMENT: Charles River Associates, Incorporated

34 369391

**EVALUATION OF USER-SIDE SUBSIDIES AND TRANSIT SERVICE IMPROVEMENTS FOR THE TRANSIT DEPENDENT**

The project involves evaluation of three demonstrations of user-side subsidies for travel by the elderly and handicapped under the UMTA Service and Methods Demonstration program. These projects are located in Montgomery, Alabama; Kinston, North Carolina; and Lawrence, Massachusetts. The evaluations encompass the effects of the projects on users, taxi and transit service producers, and others agencies, as well as assess the effectiveness of alternative subsidy mechanisms.

**REFERENCES:**

User-Side Subsidy Demonstration Project: Kinston, North Carolina, Charles River Associates, Oct. 1980

PERFORMING AGENCY: Charles River Associates, Incorporated, 495.24

INVESTIGATOR: Nelson, M Tel (617) 266-0500

SPONSORING AGENCY: Transportation Systems Center Contract DOT-TSC-1757-24

STATUS: Active NOTICE DATE: Nov 1982

START DATE: Sept. 1976 COMPLETION DATE: Mar. 1983

TOTAL FUNDS: \$200,000

ACKNOWLEDGMENT: Charles River Associates, Incorporated

34 369393

**CASE STUDY OF LANCASTER INTEGRATED SPECIALIZED TRANSPORTATION SYSTEM**

This case study investigates the ongoing Lancaster Integrated Specialized Transportation System, which coordinates human service agency transportation requests within Lancaster County, Pennsylvania. The case study describes the history and current operations of the program, the use of the program by human service agencies, and program costs and funding sources.

PERFORMING AGENCY: Charles River Associates, Incorporated, 495.38

INVESTIGATOR: Lovely, MF Tel (617) 266-0500

SPONSORING AGENCY: Transportation Systems Center Contract DOT-TSC-1757-38

STATUS: Active NOTICE DATE: Nov. 1982

START DATE: June 1982 COMPLETION DATE: Feb. 1983

TOTAL FUNDS: \$11,500

ACKNOWLEDGMENT: Charles River Associates, Incorporated

34 385021

**DATA COLLECTION SYSTEM FOR PLANNING SERVICES FOR ELDERLY AND HANDICAPPED PERSONS**

The project was designed to develop an integrated approach to the collection of data for the planning of services for elderly and handicapped persons. The system designed includes use of census data, an areawide telephone survey with two stages—a screening stage and a detailed stage and use of onboard and self-identification type surveys for service monitoring.

## Transportation of Special User Groups

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**REFERENCES:**

Planning Services for Transportation Handicapped People: Data Collection Manual, Dornan, D; Middendorf, D, DOT-I-83-40, Aug. 1983

**PERFORMING AGENCY:** Peat, Marwick, Mitchell and Company,  
UMTA-IT-09-9009 UMTA-DC-09-9049

**INVESTIGATOR:** Ellis, R Tel (202) 223-9525

**SPONSORING AGENCY:** Urban Mass Transportation Administration

**RESPONSIBLE INDIVIDUAL:** Steinmann, R (UBP-30) Tel (202) 426-4058 Contract UMTA-IT-09-9009

**STATUS:** Active **NOTICE DATE:** Apr. 1984

**START DATE:** Nov. 1977 **COMPLETION DATE:** Dec. 1983

**TOTAL FUNDS:** \$305,000

**ACKNOWLEDGMENT:** UMTA

41 179331

**MARTA IMPACT STUDY**

This study is designed to provide a continuing assessment of the impacts of the new rail rapid transit system in Atlanta. Work prior to the opening in 1979 concentrated on obtaining "before" and base-case data on the impacts of construction. Operational impact measurement began in 1979.

PERFORMING AGENCY: Atlanta Regional Commission  
 INVESTIGATOR: Stone, J Tel (404) 656-7700  
 SPONSORING AGENCY: Urban Mass Transportation Administration,  
 Office of Planning Assistance, 400 7th Street, SW  
 RESPONSIBLE INDIVIDUAL: Steinmann, R Tel (202) 472-  
 5140 Contract GA-09-7002  
 STATUS: Active NOTICE DATE: Aug. 1980  
 START DATE: Mar. 1976 COMPLETION DATE: Dec. 1983  
 ACKNOWLEDGMENT: UMTA

41 384971

**A STUDY TO ASSESS THE IMPORTANCE OF PERSONAL, SOCIAL, PSYCHOLOGICAL AND OTHER FACTORS IN RIDESHARING PROGRAMS**

The dominant techniques which have been used to promote and implement ridesharing programs has been global TV, radio and newspaper advertisement, and the implementation of computer matching programs. But some studies have found that the decision to rideshare is not entirely an economic choice in that it is strongly influenced by personal, social and psychological factors (Margolin and Misch, 1978). There is little or no knowledge about the factors which contribute to the success or failure of most ridesharing programs sponsored both by private and public agencies. There are successful employer programs as well as unsuccessful employer sponsored programs. Using the study of Margolin and Misch as a basis, this project will investigate the building of ridesharers profiles based on social, economic, political, psychological and personal factors. It will attempt to investigate the ridesharing programs across various agency types and determine the extent to which employer sponsorship influences participation in ridesharing programs. It is anticipated that the results of the research effort should lead to a more comprehensive approach to develop and promote ridesharing programs. It is expected that the effort may lead to the inclusion of social, political, religious, ethnic, personal, psychological variables in the development of ridesharing programs. In the long run, the results of this study could form the basis for conducting workshops and seminars for ridesharing coordinators with the main objective of increasing ridership. This case study is expected to be useful to improve other ridesharing programs throughout the nation.

PERFORMING AGENCY: Morgan State University  
 INVESTIGATOR: Nyame-Mensah, H Tel (301) 444-3348  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Tate, R (URT-31) Tel (202) 426-  
 4984 Grant MD-11-0005  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1982  
 TOTAL FUNDS: \$65,623  
 ACKNOWLEDGMENT: UMTA

41 385041

**STANDARDIZATION AND DOCUMENTATION OF TRANES**

The TRANES computer program uses U.S. Census Data (GBF/DIME File) to estimate persons and households within walking distance of proposed, alternative transit routes.

PERFORMING AGENCY: Puget Sound Council of Governments, WA-  
 06-0022  
 INVESTIGATOR: Frysztacki, W Tel (206) 464-6174  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Hillegass, TJ (URT-41) Tel (202) 426-  
 9271 Contract WA-06-0022  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Aug. 1982 COMPLETION DATE: Jan. 1984  
 TOTAL FUNDS: \$149,820  
 ACKNOWLEDGMENT: UMTA

41 385042

**INNER CITY MOBILITY**

As part of overall brokerage effort, GBTD is looking closely at the transportation needs of one particular inner city neighborhood on Bridgeport's East Side. Based on the results of market research and citizen participation services will be designed and promoted. Focus will probably be on improved information about existing services and promotion of shared ride taxi.

PERFORMING AGENCY: Greater Bridgeport Transit District  
 INVESTIGATOR: Brennan, P Tel (203) 366-7070  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Churchman, MM (URT-31) Tel (202)  
 426-4984 Contract CT-06-0010  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Sept. 1980 COMPLETION DATE: Sept. 1984  
 TOTAL FUNDS: \$360,000  
 ACKNOWLEDGMENT: UMTA

42 333530

**IMPROVED METHODS FOR SHORT-RANGE TRANSIT PLANNING AND MANAGEMENT**

Transit operators currently face a set of pressures which have been developing over the past five years, including: increased emphasis on short-range transit improvement strategies as reflected in the Transportation Systems Management requirement; increased fiscal conservatism resulting in the need to demonstrate cost-effectiveness of individual transit services; increased expectations for transit's role in accommodating future energy shortages.

PERFORMING AGENCY: Massachusetts Institute of Technology, Center for Transportation Studies  
 INVESTIGATOR: Wilson, N Tel (617) 253-5046  
 SPONSORING AGENCY: Urban Mass Transportation Administration

STATUS: Active NOTICE DATE: Jan. 1984  
 START DATE: Sept. 1980 COMPLETION DATE: Aug. 1983  
 ACKNOWLEDGMENT: Massachusetts Institute of Technology

42 349148

**NATIONAL TRANSIT COMPUTER SOFTWARE DIRECTORY**

Over the past decade, computer software systems have gained widespread acceptance as important management and operating tools in public transit agencies. Representative software applications include planning (UTPS), scheduling (RUCUS), operations control, maintenance (SIMS), finance, and personnel. Software developed by one agency can often be adapted for use by other agencies, but lack of knowledge of existing software and its applications is resulting in costly duplication of development efforts. The objective of this research is to develop and pilot test a methodology for the establishment and continuous updating of an automated directory of computer software to be used as a clearinghouse, making information available to individual public transit agencies that are planning software development. The directory shall have the capability of including (1) software suitable for use by transit agencies of all sizes, and (2) existing and future software for use on computers of all types and sizes.

PERFORMING AGENCY: Comsis Corporation  
 INVESTIGATOR: Levinsohn, DM Tel (301) 933-9211  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Smith, HA Tel (202) 334-3224  
 NCTRP 38-1  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Jan. 1983 COMPLETION DATE: Apr. 1984  
 TOTAL FUNDS: \$100,000  
 ACKNOWLEDGMENT: National Cooperative Transit Res and Dev Program

42 369373

**IMPROVING DECISION-MAKING FOR MAJOR URBAN TRANSIT ISSUES**

The objective is to assess the federal, state and local decision-making process for major urban mass transportation investments by evaluating recent alternatives analysis experiences. The purpose is to identify potential improvements in policy, procedures and use of technical information, and to formulate planning procedures recommendations for use by federal, state and local agencies. Such improvements would be in terms of time, costs, scale, presentation of information and role of participants. Case studies will be undertaken and finally there will be formulation of recommendations to Federal DOT and to state and local agencies.

Final report in preparation. NCTRP Report 4.

PERFORMING AGENCY: System Design Concepts, Incorporated  
 INVESTIGATOR: Stowers, JR Tel (202) 393-5910  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Kingham, RI Tel (202) 334-3224 NCTRP 36-1  
 STATUS: Completed NOTICE DATE: May 1984  
 START DATE: Nov. 1981 COMPLETION DATE: Nov. 1983  
 TOTAL FUNDS: \$150,000  
 ACKNOWLEDGMENT: National Cooperative Transit Res & Dev Program

42 369374

**SIMPLIFIED GUIDELINES FOR EVALUATING TRANSIT OPTIONS IN SMALL URBAN AREAS**

Guidelines will be developed for use by transit and municipal agencies in guiding their analysis of proposed transit and paratransit alternatives and in presenting their proposals to the decision-making bodies, resulting in the public's better understanding of proposed investments for new or improved existing transit systems. Sound benefit-cost techniques should guard against inadequate analysis. Guidelines will be designed for use by nontechnical people and apply to urban areas of up to 200,000 population. Considerations such as total costs, avoidable costs, transportation alternatives, ridership, urban development factors, conservation of energy and other resources, and typical transit evaluation criteria will be addressed. Priceable and nonpriceable factors will be identified that should be included in guidelines for small urban areas. A portable educational package will be developed for use in demonstrating the analytic procedures to city councils and transportation planning boards.

Final report in preparation.

PERFORMING AGENCY: Barton-Aschman Associates, Incorporated

SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Spicher, RE Tel (202) 334-3224  
 NCTRP 40-1

STATUS: Active NOTICE DATE: May 1984  
 START DATE: Oct. 1982 COMPLETION DATE: Apr. 1984  
 TOTAL FUNDS: \$150,000  
 ACKNOWLEDGMENT: National Cooperative Transit Res & Dev Program

42 369396

**CROSS CUTTING ANALYSIS OF RAIL TRANSIT IMPACT STUDIES**

The objective of this study is to review existing impact studies performed in three cities (Washington, D.C., Atlanta, and San Francisco) and to identify the evidence of the effects of transit investments. The reasons why forecasted impacts differ from actual impacts, and the implications of the study findings on federal rail transit investment policy will be assessed.

PERFORMING AGENCY: Charles River Associates, Incorporated, 495.41  
 INVESTIGATOR: Benham, J Tel (617) 266-0500 Brand, D  
 SPONSORING AGENCY: Transportation Systems Center; Department of Transportation Contract DOT-TSC-1757-41  
 STATUS: Active NOTICE DATE: Nov. 1982  
 START DATE: Oct. 1982 COMPLETION DATE: Apr. 1983  
 TOTAL FUNDS: \$50,000  
 ACKNOWLEDGMENT: Charles River Associates, Incorporated

42 384928

**TRANSIT SERVICE IMPROVEMENTS IN ORLANDO'S SOUTHWEST CORRIDOR**

Continuing growth of tourist attractions in Orlando's Southwest corridor has created traffic congestion and the potential for fixed guideway service. This project will provide bus service for tourists and employees along the alignment of a potential future \$500 million fixed guideway facility. The project will serve as a test and provide useful data for planning the future \$500 million fixed guideway facility.

PERFORMING AGENCY: Transportation Systems Center, UMTA-FL-06-0037; Multisystems, Incorporated  
 INVESTIGATOR: Day, B Tel (617) 864-5810  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Goodman, JM (URT-31) Tel (202) 426-4984 Contract UMTA-FL-06-0037  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: 1983 COMPLETION DATE: 1985  
 TOTAL FUNDS: \$735,000  
 ACKNOWLEDGMENT: UMTA

42 384934

**1980 CENSUS INFORMATION: ANALYSIS FOR USE IN SMALL CITY SYNTHETIC TRANSPORTATION PLANNING MODELS**

To provide practical responses to the needs of Alabama's smaller cities for information and assistance in transportation planning support of central

business district revitalization. Included will be an analysis of 1980 census information for use in synthetic transportation planning models and adjustment to those models for use in smaller cities. Testing of the models in two Alabama urbanized areas, translation of models for use in smaller cities, and adjustment of models to account for small city central business districts will also be attempted. The report will be a guide for the use of 1980 census information in synthetic transportation models for smaller urbanized areas and small cities in support of central business district revitalization.

PERFORMING AGENCY: Auburn University, UMTA-AL-06-0012  
 INVESTIGATOR: Meyer, D Tel (205) 526-4577  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Meade, JZ (URT-33) Tel (202) 426-0080 Grant UMTA-AL-06-0012  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Aug. 1983 COMPLETION DATE: Aug. 1984  
 TOTAL FUNDS: \$84,820  
 ACKNOWLEDGMENT: UMTA

**42 384984****EVALUATION OF SECTION 3(A)(1)(C) AND 4(I) PROGRAM**

The New Technology Introduction, Section 3(a)(C) and Innovative Techniques and Methods, Section 4(i), programs are designed to provide incentive for transit agencies and other local and State jurisdictions to implement new technology and techniques. The project will evaluate the effects of the first years' funding (FY82) of 35 projects, by evaluating a sample of approximately 20 projects for general results such as increase in patronage, decrease in operating costs, etc.

PERFORMING AGENCY: Comsis Corporation, UMTA-MD-06-0098  
 INVESTIGATOR: Kuzmyack, JR Tel (202) 933-9211  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Goodman, JM (URT-31) Tel (202) 426-4984

STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: 1983 COMPLETION DATE: 1984  
 ACKNOWLEDGMENT: UMTA

**42 384995****TECHNOLOGY TRANSFER AND THE ACADEMIC**

To review the technology transfer process and to investigate the appropriate role of the academic to address training and application needs of Urban Mass Transportation Administration clients. A literature review of education needs in urban mass transportation will be conducted as well as an analysis of university involvement. Background development of the professional role of the university, academician and the technology transfer process will be analyzed. A literature survey will be supplemented by personal or telephone interviews with the staffs of technology transfer agencies in U.S. DOT and elsewhere. There interviews will be conducted in Washington, D.C., Norman, Oklahoma and Oklahoma City, Oklahoma. In addition, a questionnaire survey will be sent to Transportation Research Board University representatives.

PERFORMING AGENCY: Oklahoma University  
 INVESTIGATOR: Cook, AR Tel (405) 325-5911  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Baxter, MP (UOA-1) Tel (202) 426-0080 Grant OK-11-0002  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Jan. 1982  
 TOTAL FUNDS: \$9,510  
 ACKNOWLEDGMENT: UMTA

**42 385020****STRATEGIC PLANNING FOR TRANSIT OPERATORS**

The project is designed to demonstrate the application of private sector strategic planning methods to a public transit agency. This study involves a broad look at all aspects of WMATA internal operating procedures together with a review of the likely future environment in which it will operate. This study is designed to look beyond traditional facilities or financial planning at the entire organization.

PERFORMING AGENCY: Washington Metropolitan Area Transit Authority, UMTA-DC-09-7007  
 INVESTIGATOR: Burke, A Tel (202) 637-1481  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Steinmann, R (UBP-30) Tel (202) 426-4058 Contract UMTA-DC-09-7007  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Sept. 1982 COMPLETION DATE: Sept. 1984  
 TOTAL FUNDS: \$162,750  
 ACKNOWLEDGMENT: UMTA

**42 385025****URBAN MASS TRANSPORTATION RESEARCH INFORMATION SERVICE**

Acquisition, selection, storage, retrieval and dissemination of research information that is generated by and/or that is useful to administrators, researchers and other specialists in the public transit and related fields of transportation research. To provide a central point for industry, academia, government and others to disseminate technical information, research results, and information on ongoing research efforts to facilitate technology utilization.

PERFORMING AGENCY: Transportation Research Board  
 INVESTIGATOR: Houser, FN Tel (202) 334-3251  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Durham, J Tel (202) 472-7037  
 Contract UMTA-DC-06-0285  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Aug. 1981 COMPLETION DATE: Oct. 1984  
 TOTAL FUNDS: \$900,000  
 ACKNOWLEDGMENT: UMTA

**42 385043****PUBLIC/PRIVATE TRANSPORTATION MANAGEMENT**

This project is to establish a public/private transportation organization in Hartford. The objective is to develop a balanced set of strategies for increasing the capacity of all the transportation system elements and to improve intermodal coordination.

PERFORMING AGENCY: Greater Hartford Ridesharing Agency, CT-06-0014  
 INVESTIGATOR: Blanco, M Tel (203) 527-4472  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: McKeown, SN (URT-31) Tel (202) 426-4984 Contract CT-06-0014  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Oct. 1982 COMPLETION DATE: Oct. 1984  
 TOTAL FUNDS: \$222,000  
 ACKNOWLEDGMENT: UMTA

**42 385060****PILOT TESTING OF PLANNING METHODS**

This project is intended to assure the integrity of transportation planning software and manual techniques developed and distributed by UMTA. It also will assist the planning community in the use of these methods. These objectives are accomplished through operation of a UTPS Support Center, development of training and user materials, and teaching of courses on the planning methods available. The Support Center assists users of the Urban Transportation Planning System through a hotline, a newsletter of user-reported "bugs" and distribution of supporting documents and computer tapes.

PERFORMING AGENCY: Comsis Corporation, DTUM60-82-C-72115  
 INVESTIGATOR: Levinsohn, D Tel (301) 933-9211  
 SPONSORING AGENCY: Urban Mass Transportation Administration;  
 Federal Highway Administration  
 RESPONSIBLE INDIVIDUAL: Ossi, AJ (URT-41) Tel (202) 426-1700 Contract IT-06-0119  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Jan. 1982 COMPLETION DATE: Jan. 1985  
 TOTAL FUNDS: \$700,000  
 ACKNOWLEDGMENT: UMTA



43 334885

**RESOURCE ALLOCATION TO TRANSPORTATION PROGRAMS IN TRI-CITIES AREA**

Evaluate the allocation of transportation resources in the Tri-Cities area to determine the efficiency and effectiveness of the allocations in terms of energy utilization and regional socioeconomic development. Use the findings to develop transportation strategies and to encourage intercommunitation for growth plans. Monitor the application of the findings.

**REFERENCES:**

Public Transportation Planning Allocation of Transportation Resources, Nielsen, R; Shea, DJ; Yandon, KE, May 1982  
Socio-Economic Characteristics for the Allocation of Transportation Resources, Shea, DJ; Yandon, KE, June 1982

**PERFORMING AGENCY:** Washington State Department of Transportation, HR 587

**INVESTIGATOR:** Shea, DJ Tel (206) 753-5784

**SPONSORING AGENCY:** Washington State Department of Transportation; Federal Highway Administration

**RESPONSIBLE INDIVIDUAL:** HP&R

**STATUS:** Completed **NOTICE DATE:** Nov. 1982

**START DATE:** July 1980

**TOTAL FUNDS:** \$43,580

**ACKNOWLEDGMENT:** Washington State Department of Transportation

43 369389

**NEW YORK METROPOLITAN TRANSPORTATION AUTHORITY: REVENUE BOND FEASIBILITY STUDY**

For the purpose of selling a series of Revenue Bonds to obtain capital funds needed to upgrade New York's mass transit and commuter rail system, CRA has developed forecasts of the ridership and revenue impacts associated with implementing MTA's five-year, \$8 billion capital improvement program. The results of the analysis of the bus and subway system have been incorporated into the official statement for the MTA's \$250,000,000 Series A bonds. Models were estimated to forecast ridership, revenue, and operating costs for a ten-year time horizon. The study is also examining the effects on New York's economy of implementing the capital program.

**REFERENCES:**

New York City Transit Authority Revenue Feasibility Study: Economic Analysis and Projections, Charles River Associates, Oct. 1982

Historical Ridership & Revenue Analysis & Model Development for Metro North and Long Island Rail Road, Charles River Associates, Draft Intrm Rpt, Nov. 1982

**PERFORMING AGENCY:** Charles River Associates, Incorporated, 644

**INVESTIGATOR:** Parody, TE Tel (617) 266-0500 Brand, D Benham, J

**SPONSORING AGENCY:** Metropolitan Transportation Authority Contract 2-01-21028-0-0

**STATUS:** Active **NOTICE DATE:** Nov. 1982

**START DATE:** Dec. 1981 **COMPLETION DATE:** Apr. 1983

**TOTAL FUNDS:** \$200,000

**ACKNOWLEDGMENT:** Charles River Associates, Incorporated

43 372982

**SECTION 15 REVIEW STUDY**

An investigation of impacts on the transit industry that will result from the reduction or elimination of Section 15 funds. Final ridership, fare and operating expense levels are calculated under the assumption that transit operators will attempt to increase fares and/or reduce service in amounts that will make up for the reduction of subsidies. A number of financial and operating performance measures are also investigated in order to determine trends over time and find reasons for differences in performance among the reporting systems.

**PERFORMING AGENCY:** Polytechnic Institute of New York

**INVESTIGATOR:** Pignataro, LJ Tel (212) 643-5272 Bladikas, A

**SPONSORING AGENCY:** Urban Mass Transportation Administration Contract

**STATUS:** Active

**START DATE:** Sept. 1980 **COMPLETION DATE:** Aug. 1983

**TOTAL FUNDS:** \$60,000

**ACKNOWLEDGMENT:** Polytechnic Institute of New York

43 384937

**DEVELOPMENT AND IMPACTS OF DEDICATED FUNDING SOURCES FOR PUBLIC TRANSIT SYSTEMS**

To examine a set of stable and reliable dedicated funding sources by state and local governments and to trace the life-cycle of the arrangements from inception to current and projected transit systems. Alternative stable and reliable dedicated funding sources will be explored. The research effort will also examine systems which do not have dedicated funding arrangements and assess the impacts and particulars of the level of non-dedicated sources of funding including the rationale for such non-dedication.

**PERFORMING AGENCY:** North Carolina Agricultural and Technical State U, UMTA-NC-11-0013

**INVESTIGATOR:** Walther, E Tel (919) 379-7745

**SPONSORING AGENCY:** Urban Mass Transportation Administration

**RESPONSIBLE INDIVIDUAL:** Thomas, E (URT-33) Tel (202) 426-9267 Grant UMTA-NC-11-0013

**STATUS:** Active **NOTICE DATE:** Apr. 1984

**START DATE:** Nov. 1983 **COMPLETION DATE:** Aug. 1984

**ACKNOWLEDGMENT:** UMTA

43 384946

**FEASIBILITY AND IMPACTS OF RETURNING TRANSIT TO PRIVATE OWNERSHIP**

To evaluate the feasibility of returning transit to private ownership, and assess the impacts of such strategy. A survey of the investment community will assess the availability, requirements, and expectations of private investors in order to determine the necessary levels of profitability, return on investment, growth, and financial strength that a privately owned transit industry would have to sustain. The assessment will determine the fare levels under private operation, the capital infusion that may have to be provided to the present systems and the price at which those systems would have to be sold. The direct economic impacts to government and the public will be calculated. A methodology will be developed that would provide guide lines to assess economic and social/political impacts. Local decision makers will thus be able to superimpose the indirect and non-monetary impacts on the purely economical impacts to make final decisions.

**PERFORMING AGENCY:** Polytechnic Institute of New York, UMTA-NY-06-0108

**INVESTIGATOR:** Pignataro, L Tel (213) 643-5272

**SPONSORING AGENCY:** Urban Mass Transportation Administration

**RESPONSIBLE INDIVIDUAL:** Jasper, N (URT-33) Tel (202) 426-0080 Grant UMTA-NY-06-0108

**STATUS:** Active **NOTICE DATE:** Apr. 1984

**START DATE:** July 1983 **COMPLETION DATE:** Aug. 1984

**ACKNOWLEDGMENT:** UMTA

43 384972

**LOCAL AND STATE RESPONSES TO THE PROPOSED LOSS OF FEDERAL TRANSIT OPERATING ASSISTANCE**

The proposed elimination of federal operating assistance for transit is expected to significantly alter the structure of public transit. In many ways, this represents a challenge to states and localities committed to maintaining viable transit service. It is extremely important that the impacts of this proposed Federal policy be fully understood and that the range of alternative responses be identified and evaluated. The success or failure of state and local efforts in meeting this challenge may vitally affect future life within U.S. cities for some time. This project will help address this challenge by (1) identifying the relative dependency of transit systems upon operating subsidies; (2) identifying those systems presently most vulnerable to loss of Federal support; (3) determining the relationship of system operating characteristics to their financial health; (4) clarifying state and local options available to cover the expected revenue shortfalls; (5) identifying the planned state and local responses to any new Federal funding policy; and (6) suggesting an appropriate role for the Federal government during the period of transition that would encourage responsible state and local responses to proposed reductions of Federal funding. The results will be made available through working papers, published articles, and distribution of transit systems responding to the project's surveys.

**PERFORMING AGENCY:** Tennessee University, Knoxville

**INVESTIGATOR:** Arbeit, D Tel (615) 974-5159

**SPONSORING AGENCY:** Urban Mass Transportation Administration

# Transit Financing

RESPONSIBLE INDIVIDUAL: Bennett, J (UBP-20) Tel (202) 426-4058 Grant TN-11-0006  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1982  
 TOTAL FUNDS: \$50,322  
 ACKNOWLEDGMENT: UMTA

supplement federal grants-in-aid programs. This is to be achieved through a survey of state public transportation agencies which will result in a report and by undertaking four case studies.

PERFORMING AGENCY: Council of State Governments  
 INVESTIGATOR: Reinshuttle, RJ Tel (606) 252-2291 Dorfman, GA  
 SPONSORING AGENCY: Urban Mass Transportation Administration Contract KY-09-7001  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1983 COMPLETION DATE: July 1984  
 TOTAL FUNDS: \$123,875  
 ACKNOWLEDGMENT: UMTA

**43 385044**

**STATE OPTIONS FOR TRANSIT FINANCING**

To identify state-by-state priorities for public transportation investment(s), system improvements, and operations; to compile state expenditures for public transportation and determine methods of state financing which

44 384920

**SECTION 19 CIVIL RIGHTS PROGRAM: STRATEGIC MODEL FOR PROGRAM DEVELOPMENT AND IMPLEMENTING PROCEDURES**

To develop a strategic model civil rights program, with a range of recommendations for alternative approaches to implement and enforce Section 19 requirements particularly that are effective, cost-efficient and non-burdensome to UMTA recipients as well as to the Government. Contractor will survey other Federal agencies' procedures, review related statutes, regulations, guidelines, current trends in court cases and related civil rights studies to develop comprehensive requirements and alternative approaches to enforcement.

PERFORMING AGENCY: TRITON Corporation, UMTA-DC-09-9053  
 INVESTIGATOR: Billingsy, E Tel (202) 332-8310  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Takai, H (UCR-20) Tel (202) 426-2285 Contract DTUM60-83-R-71063  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: Sept. 1983 COMPLETION DATE: June 1984  
 TOTAL FUNDS: \$98,743  
 ACKNOWLEDGMENT: UMTA

44 384930

**MINORITY BUSINESS ENTERPRISE (MBE): AN ANALYSIS OF THE BARRIERS TO MBES IN OPERATING UMTA FUNDED PROCUREMENT CONTRACTS AT STATE AND LOCAL LEVELS**

To identify and quantify barriers to entry by MBES in obtaining procurement contracts at state and local levels; to investigate the exclusion to minority businesses from UMTA contracts and procurement through policies, policy decisions, administrative rulings, and state and local legislation; to evaluate the present levels of minority participation in UMTA funded projects; to create criteria for judging minority business involvement in UMTA procurements and transportation contracts; to examine historical issues and forces that have characterized minority participation and development policies on state and local levels for involving minorities; to explore bid preparation requirements and contract award policies established by state and local governments. The project effort will concentrate on major areas of minority involvement in planning and administration in construction and land development.

PERFORMING AGENCY: Edward Waters College, UMTA-FL-11-0010  
 INVESTIGATOR: Jackson, V Tel (904) 355-3030  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Jasper, N (URT-33) Tel (202) 426-0080 Grant UMTA-FL-11-0010  
 STATUS: Active NOTICE DATE: Apr. 1984  
 ACKNOWLEDGMENT: UMTA

44 384967

**A COMPREHENSIVE ANALYSIS OF THE ROLE, OPERATIONS AND FUNCTIONS OF THE MARTA BOARD OF DIRECTORS AS COMPARED WITH THE DADE COUNTY BOARD OF DIRECTORS**

There is a dearth of research on the structures, decision-making processes and operations of governing boards of public transit agencies. Few studies have attempted to show the relationship between a Board's policy making

process and its impact on the distribution of transit benefits among groups in the service area. Boards use different strategies to resolve complex problems within constraints posed by internal and external environmental factors. This study will comprehensively examine how the MARTA Board of Directors has operated since 1965 and why it has functioned as it has. The research will endeavor to ascertain the answers to a number of policy relevant questions including: How have the values, background and method of selection of Board members affected policy outcomes? Has the decision making process resulted in an unequal distribution of transit benefits for minority and central city inhabitants? Does MARTA have an effective inter-governmental relations strategy? How successful has the Board been in resolving intra-Board and Board-staff conflicts? What changes can be made to enhance the Board's effectiveness and improve its operation? The study will analyze thoroughly the internal and external factors impacting MARTA and made a detailed assessment of the roles, functions and operations of the Board. The conclusions and comparisons with the Dade County (Florida) Board and findings of this case study can be used to improve the functioning of MARTA as well as assist the governing boards of other urban transit agencies, such as Washington, D.C., Baltimore and Miami, to operate more efficiently and effectively.

PERFORMING AGENCY: Atlanta University  
 INVESTIGATOR: Holmes, RA Tel (404) 681-0251  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Hallman, AB (UPM-43) Tel (202) 426-9274 Grant GA-11-0013  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1982  
 TOTAL FUNDS: \$84,997  
 ACKNOWLEDGMENT: UMTA

44 384988

**URBAN TRANSPORTATION: AN ORGANIZATIONAL ASSESSMENT IN THE DELIVERY OF PUBLIC TRANSPORTATION SERVICE**

The objective of this research is to review one area of urban transportation, the organization aspect; and, (1) to identify, describe, document, and quantify some of the reasons why the present organizational structure has not been appropriate for the adequate delivery of public transportation services; (2) to examine state and local organizational structures and Federal transit policies which might interfere in different ways and to different extents, with the overall process of planning and implementing the delivery of public transportation services. The ultimate results of this research may be used by government planning agencies (state, local and federal) for improving, streamlining and making the organizational approach more responsive to the public needs in the delivery of public transportation services.

PERFORMING AGENCY: Edward Waters College  
 INVESTIGATOR: Jackson, VV Tel (904) 355-3030  
 SPONSORING AGENCY: Urban Mass Transportation Administration  
 RESPONSIBLE INDIVIDUAL: Griffin, Y (UBP-20) Tel (202) 426-1428 Grant FL-11-0006  
 STATUS: Active NOTICE DATE: Apr. 1984  
 START DATE: July 1982  
 TOTAL FUNDS: \$49,988  
 ACKNOWLEDGMENT: UMTA

45 372980

**STRATEGIES TO IMPLEMENT BENEFIT-SHARING FOR  
FIXED TRANSIT FACILITIES**

A number of major American cities are considering either new fixed-rail transit systems or additions to existing systems. Previous studies have shown a high correlation between the presence of fixed-rail transit and a significant increase in the value of land adjacent to the transit line(s). The first objective of this research is to develop a methodology to calculate the financial benefits that will be realized by owners of property adjacent to transit improvements. The second objective is to develop a method to recapture for public use a portion of these financial benefits to help defray the cost of transit improvements. The method of value recapture would probably involve some form of financial "assessment" of the owners of land adjacent to fixed-rail transit lines. Among the specific issues to be addressed: (1) Should the "assessment" be based only on the capital cost of the transportation improvements or on both capital and long-term operating costs? (2) Should the "assessment" be imposed only on new developments or on both new and existing projects? (3) Should the "assessment" be a one-time payment or spread over an extended period of

time, such as the life of the building (as defined by the IRS)? (4) Should the "assessment" take a variety of forms, at the option of the landowner, such as cash payment; subsidized transit passes, or support for a ridersharing program? (NOTE: Given the UMTA position that a wealth of information seems to exist in this problem area, this research-rather than developing new methodology-could take the direction of a summary and evaluation of existing methodology, or the topic could be broadened (funding permitting) to include an assessment of alternative financing schemes for transit).

PERFORMING AGENCY: SG Associates, Stuart Street

INVESTIGATOR: Howard, J Tel (617) 542-1416

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Kingham, RI Tel (202) 334-3224 NCTRP 40-3

STATUS: Active NOTICE DATE: May 1984

START DATE: Nov. 1983 COMPLETION DATE: Feb. 1985

TOTAL FUNDS: \$100,000

ACKNOWLEDGMENT: National Cooperative Transit Res &amp; Devel Program

**46 315712****EVALUATION OF PROVIDENCE AUTO RESTRICTED ZONE SERVICE AND METHODS DEMONSTRATION PROGRAM**

This project will evaluate the impacts of auto restrictions, transit route interlining, downtown free fare service, and transfer point consolidation on changes in transportation supply and level of service, travel behavior, pedestrian and purchasing behavior and business establishment activity using before and after data. This project also includes extensive documentation of the urban revitalization process in downtown Providence.

**REFERENCES:**

Final Evaluation Framework for the Providence Auto Restricted Zone Demonstration, Charles River Associates, Aug. 1979

Draft Data Collection Plan for the Providence Auto Restricted Zone Demonstration, Charles River Associates, Nov. 1979

**PERFORMING AGENCY:** Charles River Associates, Incorporated, 495.21

**INVESTIGATOR:** Lovely, ME Tel (617) 266-0500

**SPONSORING AGENCY:** Transportation Systems Center

**RESPONSIBLE INDIVIDUAL:** Jacobson, J Tel (617) 494-2510  
Contract DOT-TSC-1757-21

**STATUS:** Active **NOTICE DATE:** Nov. 1981

**START DATE:** May 1979 **COMPLETION DATE:** Dec. 1984

**TOTAL FUNDS:** \$120,000

**ACKNOWLEDGMENT:** Charles River Associates, Incorporated

**46 384927****HARTFORD TRANSPORTATION MANAGEMENT ORGANIZATION**

The Hartford Transportation Management Organization (HTMO) will coordinate all aspects of transportation in the Hartford Central Business District (CBD). It will be a cooperative effort of the public and private sectors control to the growth of parking and the single occupant automobile by making the most use of existing resources such as transit, ridesharing, private buses, and existing street space. Ultimately, this project will provide a model for other cities to manage their transportation resources more effectively.

**PERFORMING AGENCY:** Greater Hartford Ridesharing Corporation, UMTA-CT-06-0014

**INVESTIGATOR:** Blanco, M Tel (203) 525-2277

**SPONSORING AGENCY:** Urban Mass Transportation Administration

**RESPONSIBLE INDIVIDUAL:** McKeown, SN (URT-31) Tel (202) 426-4984

**STATUS:** Active **NOTICE DATE:** Apr. 1984

**START DATE:** Oct. 1982 **COMPLETION DATE:** June 1984

**TOTAL FUNDS:** \$372,000

**ACKNOWLEDGMENT:** UMTA

**46 385023****TSM IN NEIGHBORHOODS: INVOLVING CITIZENS IN THE PLANNING PROCESS**

The study is designed to develop methods to obtain the participation of neighborhood residents in the development of plans for managing traffic in the area. The main tool involves development of a simulation designed to involve the citizens in all stages of the decision and to improve their understanding of the various points-of-view of different actors in the process. The results will include neighborhood level TSM plans involving traffic diversion, signal operations, parking policy and transit.

**PERFORMING AGENCY:** District of Columbia Department of Transportation, UMTA-DC-09-7006

**INVESTIGATOR:** Simkowitz, H Tel (202) 727-5843

**SPONSORING AGENCY:** Urban Mass Transportation Administration  
**RESPONSIBLE INDIVIDUAL:** Steinmann, R (UBP-30) Tel (202) 426-4058 Contract UMTA-DC-09-7006

**STATUS:** Active **NOTICE DATE:** Apr. 1984

**START DATE:** July 1982 **COMPLETION DATE:** July 1984

**TOTAL FUNDS:** \$136,000

**ACKNOWLEDGMENT:** UMTA

**46 385030****PROVIDENCE AUTO RESTRICTED ZONE**

The Providence Auto-Restricted Zone evaluation focuses on the effects of a series of transit and pedestrian improvements in the context of a downtown area undergoing extensive urban revitalization. The demonstration, designed to complement Providence's existing auto-restricted zone (the Westminster Mall) and ongoing downtown projects, consists of a number of major elements. First, to ease transferring and to link the bus network to Westminster Mall, the demonstration consolidates transfer locations and creates new pedestrian areas and walkways in the Kennedy Plaza area. Second, to improve the regional bus network, the demonstration includes the through routing of seven bus routes and the designation of bus priority lanes in the downtown. Third, to encourage intra-downtown trips, the project utilizes through-routed buses to create a CBD free-fare zone. Finally, the demonstration involves the management of programmed ARZ activities by setting up a Mall Management Office.

**PERFORMING AGENCY:** Charles River Associates, Incorporated, UMTA-MA-06-0049 UMTA-RI-06-0010; Providence, City of, Rhode Island

**INVESTIGATOR:** Slaughter, S Tel (617) 266-0500

**SPONSORING AGENCY:** Urban Mass Transportation Administration

**RESPONSIBLE INDIVIDUAL:** Goodman, JM (URT-31) Tel (202) 426-4984 Contract UMTA-RI-06-0010

**STATUS:** Active **NOTICE DATE:** Apr. 1984

**START DATE:** June 1981 **COMPLETION DATE:** June 1984

**TOTAL FUNDS:** \$960,000

**ACKNOWLEDGMENT:** UMTA

**46 385045****PRIVATE/PUBLIC TRANSPORTATION MANAGEMENT INITIATIVE FOR DOWNTOWN DENVER**

This project is to provide the recipient with the necessary technical assistance to establish a transportation management component to access and develop new techniques to resolve the transportation problems in downtown Denver.

**PERFORMING AGENCY:** Denver Civic Ventures, CO-06-0013

**INVESTIGATOR:** Fleming, R Tel (303) 534-6161

**SPONSORING AGENCY:** Urban Mass Transportation Administration

**RESPONSIBLE INDIVIDUAL:** McKeown, SN (URT-31) Tel (202) 426-4984 Contract CO-06-0013

**STATUS:** Active **NOTICE DATE:** Apr. 1984

**START DATE:** Sept. 1982 **COMPLETION DATE:** Sept. 1984

**TOTAL FUNDS:** \$300,000

**ACKNOWLEDGMENT:** UMTA

48 384965

**AN EVALUATION OF URBAN TRANSPORTATION ENERGY CONTINGENCY PLANS AND PLANNING INCLUDING THEIR IMPACTS ON DELIVERY OF SERVICES**

Objectives are to analyze the possible impacts of urban transportation on the delivery of transit service to the elderly, handicapped and poor in the event of energy contingency; to facilitate the minimum possible implementation time by providing well-structured course of action(s) in the event of energy emergency; to develop plans which are consistent with Federal, state and regional energy plans and; to review metropolitan energy contingency plans and analyze their impact on transit. This research project will address two main areas: (1) the analysis of contingency plans from local governments and transit organizations to identify the most successful strategies; and (2) measurement of the impacts that these strategies have on the delivery of transit service to minorities. Completed contingency plans will be assembled and analyzed to select a set of guidelines for a "mode" transit contingency plan. Variables which dictate certain actions will be identified and available analytical techniques for evaluation will be modified for utilization in this study.

PERFORMING AGENCY: Atlanta University

INVESTIGATOR: Davis, EL Tel (404) 577-8786 Glover, I

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Steinmann, R (UBP-30) Tel (202) 426-5140 Grant GA-11-0012

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Sept. 1981

TOTAL FUNDS: \$69,649

ACKNOWLEDGMENT: UMTA

48 384987

**OIL DEREGULATION AND ITS IMPACTS ON PUBLIC TRANSPORTATION FUEL SUPPLY**

The federal government has withdrawn from its role as the formulator and controller of oil allocation procedures during energy supply shortages. States are faced with a new set of questions: can public transportation services be assured now of adequate (and even additional) fuel supplies during energy contingencies; and are there actions that can be taken on the state and local level to assure an adequate allocation to transit systems, and/or services? The research will provide answers to those two questions. The methodology which this research employs includes examining the 1979 fuel crisis for insight into oil industry allocation behavior; surveying state and local actions taken since 1979 to fill the energy deregulation vacuum; and interviewing oil industry representatives to ascertain intended allocation procedures under various energy contingency scenarios. Results will indicate the likelihood of public transportation fuel needs being met in contingency conditions, from which recommendations will be formulated concerning appropriate (and inappropriate) actions which states and local areas could take to benefit (or adversely affect) transit fuel supply.

PERFORMING AGENCY: Polytechnic Institute of New York

INVESTIGATOR: McShane, WR Tel (212) 643-5525

SPONSORING AGENCY: Urban Mass Transportation Administration  
RESPONSIBLE INDIVIDUAL: Steinmann, R (UBP-30) Tel (202) 426-2053 Grant NY-11-0027

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: July 1982

TOTAL FUNDS: \$84,723

ACKNOWLEDGMENT: UMTA

48 385007

**TECHNICAL ASSISTANCE FOR ENERGY AND PROPULSION TECHNOLOGY**

The purpose of this study is to obtain DOE technical assessment and program evaluation of: 1) the UMTA energy and propulsion technology program, and 2) the DOE energy and propulsion programs using the urban bus as a potential application. The study provides technology overview information and data on DOE present and planned advanced propulsion system projects, and technical review and assessment inputs in overlapping energy and propulsion. This study will reduce duplication of effort in energy related topics by both agencies.

PERFORMING AGENCY: Department of Energy, UMTA-DC-06-0259

INVESTIGATOR: Patterson, E Tel (202) 353-4498

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Asatoorian, SD (URT-22) Tel (202) 426-8483 Contract UMTA-DC-06-0259

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: May 1979 COMPLETION DATE: June 1984

TOTAL FUNDS: \$70,000

ACKNOWLEDGMENT: UMTA

48 385093

**FUEL CELL FEASIBILITY STUDY**

This activity is to ensure that fuel cell feasibility study performed by Los Alamos National Laboratory adequately covers transit operating agencies' needs and concerns. Information will be provided to Los Alamos in the preparation of the fuel cell study report and assistance given to UMTA in review of the report. Fuel cells are accepted environmentally as efficient alternatives for propulsion systems. The effort is to determine their cost effectiveness.

PERFORMING AGENCY: Georgetown University, UMTA-DC-06-0471

INVESTIGATOR: Price, D Tel (202) 625-4352

SPONSORING AGENCY: Urban Mass Transportation Administration

RESPONSIBLE INDIVIDUAL: Sullivan, PJ (URT-21) Tel (202) 426-8483 Contract UMTA-DC-06-0471

STATUS: Active NOTICE DATE: Apr. 1984

START DATE: Apr. 1984 COMPLETION DATE: Apr. 1985

TOTAL FUNDS: \$8,000

ACKNOWLEDGMENT: UMTA

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### C

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## E

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