ÉTUDES ET
RECHERCHES
EN TRANSPORTS

BICYCLING IN QUÉBEC IN 1995 AND 1996
VOLUME 1

DIANE COUTURE
MARC JOLICOEUR
JEAN-FRANÇOIS PRONOVOST

SYSTÈMES
DE TRANSPORT

Québec

BICYCLING IN QUÉBEC IN 1995 AND 1996

VOLUME I

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But de l'étude, recherche et renseignements supplémentaires

The aim of this study is to characterize bicycle use as a means of transport. For this purpose, we strove to: 1) identify the indicators needed to analyse bicycling in Québec and devise a data collection method; 2) provide a representative data base; and 3) prepare a portrait of the situation on the basis of the main indicators.

Résumé du rapport

This study was carried out following the publication of the *Bicycle Policy* by the ministère des Transports in 1995. Its aim was to characterize bicycle use according to the frequency and length of trips as well as distances travelled. The data were derived from a telephone survey and from bicycle counts or observations made on bikeways throughout the province. With its 5 million bicycles, Québec has one of the highest ratios of bicycles per person in the world. In addition, it has a thriving bicycle manufacturing industry, as reflected by the fact that Québec produces 75% of the bicycles manufactured in Canada.

The number of bicycle users in Québec is constantly on the rise. Including 2.85 million adults, it totals 3.6 million when both adults and children are taken into account. It is estimated that Quebecers as a whole bicycle 120 million km per week. During the summer, 8% of cyclists use a bicycle as their main means of transportation, while 13% use one occasionally as a mode of transport. The majority (79%), however, ride solely for recreation.

This study also reveals that Québec has 2 315 km of bicycle facilities of all kinds. Compared with other urban centres, the Communauté urbaine de Montréal, has one of the longest bikeway networks in the world. It lags behind, however, with respect to the percentage of total trips made by bicycle.

On the basis of respondents' perception of changes in bicycle use, bicycling seems to have increased by 8%. However, actual trends will have to be re-examined in a few years using new statistical data.

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FOREWORD

This study was conducted following the publication of the *Bicycle Policy* by the ministère des Transports du Québec in June 1995. It provides a general description of the parameters that characterize all forms of bicycle use in Québec, and constitutes a basis on which it will be possible to assess the impact of the policy in a few years.

We begin this report by briefly reviewing the measures that have been implemented over the past 20 years and that have led to the adoption of a bicycle policy by the Québec government and, particularly, the ministère des Transports. We then provide statistics on the number of bicycles available in Québec for various uses in relation to the bicycle market. To establish current levels of bicycle use, we present and interpret the results of a vast survey conducted throughout Québec in September and October 1995. Lastly, we describe the various facilities and services that promote bicycle use.

This report comprises two volumes. The first presents the conclusions reached on the basis of our research, as well as a portrait of bicycling in Québec. The second contains the raw data used to draw these conclusions, and a report on the above-mentioned survey, conducted by Déscarie & Complices.

Volume II is available on request from the ministère des Transports. To obtain a copy, please contact the Service de la documentation et de l'information scientifique at 700, boul. René-Lévesque Est, 21e étage, Québec (Québec) G1R 5H1 or (418) 643-6039.

INTRODUCTION

The bicycle, as we know it, was invented more than 100 years ago. A product of mechanical developments brought about by the Industrial Revolution in the 19th century, it democratized transportation. In the early 20th century, the bicycle was truly a mode of transport, since most people could not afford a car. With the creation of suburbs in the 1950s and 1960s, automobile use climbed and the bicycle was relegated to the status a child's toy! However, the bicycle experienced a renewed increase in popularity in the 1970s, as North Americans, faced with heart and weight problems, began to realize the enormous benefits of physical exercise. In addition, the 1974 oil crisis, environmental concerns and government budget cuts helped to curb the development of the road network and call the predominant role of the automobile into question, particularly in urban centres.

Although bicycles are still widely used in developing countries, there is a growing risk that this practice will decline owing to the use of private cars and to efforts by large multinational firms to sell grandiose, public transit projects in these regions. On the other hand, several industrialized nations, such as the Netherlands, Germany, Australia, the Scandinavian countries, Switzerland and Japan, are currently reviewing their passenger transportation policies to make more room for bicycles. After the *Intermodal Surface Transportation Efficiency Act* (ISTEA) was passed by Congress in late 1991, the United States began to introduce a series of measures for cyclists and pedestrians. These measures provided for a bicycle coordinator in each state, infrastructure funding and the integration of cycling and walking development plans into transportation plans.

In Québec, a renewed interest in bicycling also emerged in the 1970s. The first bikeways were laid out at that time. Facilities were installed in variety of locations, mainly for recreational purposes, but no real thought was given to how they could be linked to the public transit system or other bicycle networks. However, the situation changed dramatically in 1991, with the inauguration of the Estriade, the much acclaimed bike path laid out along an abandoned rail corridor between Granby and Waterloo. This initiative has definitely served as a model and source of inspiration for many promoters, not only with regard to planning but also joint action.

A cycling culture began to emerge at the ministère des Transports in 1977. That year, the department published a document entitled *La bicyclette, un moyen de transport*, a kind of bicycling orientation and action plan. Although the title of this plan seems self-evident today, it should be remembered that at the time, highway development was still in its heyday and efforts to maintain the free flow of traffic were being pursued at all costs. The plan was soon followed, in March 1978, by the department's first bicycle facilities standards guide, entitled *Les aménagements cyclables, leurs normes, leurs conceptions*. Ten years later, in 1990, the first edition of the *Guide technique d'aménagement des voies cyclables* (subsequently published in English under the title *Technical Handbook of Bikeway Design*) was finally put out by Vélo Québec, in collaboration with the ministère des Transports. Around the same time, the department published *Signalisation des voies cyclables*, the first signage guide in Canada. In 1992, on the occasion of the "Vélo Mondiale•Pro Bike•Velo City" conference, the department began to formulate a veritable bicycle policy. Announced in June 1996, the latter was aimed at achieving "full recognition of the bicycle as a means of transportation, and greater safety for cyclists by emphasizing mutual respect by all those using the road." About the same time, the ministère des Transports, in concert with the Secrétariat à la Jeunesse, launched the *Route verte* project, an ambitious plan to lay out a greenway across Québec. Vélo Québec was entrusted with coordinating the project.

A FEW STATISTICS

Number of bicycles

It is currently estimated that there are nearly 5 million bicycles in Québec, which represents one of the highest ratios of bicycles per person in the world. Despite the growing presence of Asian products, the bicycle industry is firmly established in Québec, which manufactures 75% of the bicycles produced in Canada.

According to the survey conducted during the present study, Québec households own an average of 1.6 adult bicycles and 0.4 children's bicycles. In actual figures, this corresponds to 3 960 000 adult bicycles and 990 000 children's bicycles, or a total of 4 950 000 bicycles. According to the same survey, 62% of Quebecers between the ages of 18 and 74 own a bicycle. When this percentage is applied to all members of the population aged 18 to 74, it represents 3 065 000 bicycle owners. The difference between this figure and the number of adult bicycles mentioned above, i.e. 3 960 000, may be explained by the fact that some people have more than one bicycle and that many adolescents under 18 years of age own adult bicycles.

Statistics Canada (1992) estimates that there were over 2 619 00 adult bicycles in Québec in 1992. The difference between this figure and those given previously may be due to, among other things, an increase in the number of bicycles acquired by Quebecers over the four-year period between the two estimates. According to the sales data provided in the next section, 1.2 million to 2 million bicycles were sold in Québec during that period.

Bicycle market

Annual sales

Québec's bicycle market may be evaluated using data derived from reports published by two organizations : Statistics Canada and the Canadian Sporting Goods Association.

Statistics Canada data

Statistics Canada estimates that 1 515 000 bicycles were sold in Canada in 1994. This figure includes all types of adult and children's bicycles. To evaluate Québec's bicycle market, we used a Statistics Canada survey (Industry, Science and Technology Canada, 1992) presenting the percentage of households that own at least one adult bicycle in each province. For the purposes of the survey, adults were defined as persons aged 15 and over.

Table 1

Number of adult bicycles in Québec and Canada in 1992

Number of households (in thousands)		Number of bicycles (in thousands) in all households with				Share of Canadian total (%)
		1 bicycle	2 bicycles	3 or more bicycles	Total	
Québec	2 656	627	1 248	741	2 616	29.2
Canada	10 056	2 212	4 224	2 534	8 970	100

Source : Statistics Canada (1992).

On the basis of this assessment, Québec households own 29.2% of the total number of bicycles in Canada, which is slightly higher than Québec's share of the country's total population. In 1992, the percentage of households (56.1%) with one or more adult bicycles in Québec exceeded that in Canada as a whole (51.4%) and was second only to that of Alberta (59.1%). The percentage of such households in Québec has risen steadily since the 1970s.

Considering that Québec's share of the total number of adult bicycles in Canada is 29.2% and assuming that the proportion is the same in the children's bicycle market, it is estimated that some 440 000 bicycles were sold in Québec in 1994. According to the Canadian Sporting Goods Association, approximately 330 000 were adult bicycles.

Canadian Sporting Goods Association data

The Canadian Sporting Goods Association estimates that 2.1 million bicycles were sold in Canada in 1994 (Canadian Sporting Goods Association, 1995). According to the same source, 656 000 bicycles were sold in Québec in 1994, or 31% of the Canadian total. Of that number, 501 000 (76%) were adult bicycles.

Table 2

Bicycle sales in Canada in 1994 (in thousands)

	Total	Children's bicycles	Adult bicycles					
			Total	Mountain	Racing	Touring	Hybrid	Other
Canada	2 097	533	1 565	1 065	58	170	143	129
Québec	656	155	501	288	12	70	106	26
Ontario	745	201	544	375	36	57	24	53
Montréal	276	80	196	124	4	23	45	5
Toronto	208	54	154	109	5	21	14	10
As a %								
Canada	100	100	100	100	100	100	100	100
Québec	31	29	32	27	21	41	74	20
Ontario	36	38	35	35	62	34	17	41
Montréal	13	15	13	12	7	14	31	4
Toronto	10	10	10	10	9	12	10	8

Source : Canadian Sporting Goods Association (1995).

Table 3

Average price of bicycles sold in Canada in 1994

	Average price (all types)	Children's bicycles	Adult bicycles					
			All types	Mountain	Racing	Touring	Hybrid	Other
Canada	209	120	240	256	260	181	292	116

Source : Canadian Sporting Goods Association (1995).

Assuming that the price of all types of bicycles sold in Québec is comparable to that of those sold in the rest of Canada, bicycle sales in Québec totalled $137 million in 1994. Sales of adult bicycles accounted for 88% of this figure, or roughly $120 million.

Table 4

Bicycle sales in Québec in 1994

	Estimate based on Statistics Canada data	Canadian Sporting Goods Association data
Bicycle sold in Québec	400 000	656 000
Adult bicycles	330 000	501 000
Children's bicycles	110 000	155 000
Total value of bicycles sold	—	$137 million

Source : Canadian Sporting Goods Association (1995) and Statistics Canada (1994).

Service life of bicycles

According to Statistics Canada, there were 2 616 000 adult bicycles in Québec in 1994. The same year, adult bicycle sales totalled between 330 000 and 501 000 units. Assuming that the latter replaced an equal number of existing bicycles, it can be concluded that the average service life of bicycles in Québec ranges from 5.2 to 7.9 years. This figure is similar to that proposed by the United States Consumer Product Safety Commission (Rodgers 1988), i.e. 7 years.

Retailers

In Québec, bicycles are distributed to consumers at various sales outlets. Every year, the firm B. J. Hunter updates an inventory of all retailers in the province, including specialty stores and department stores.

Table 5

Number of bicycle retailers in Québec

Regions	Number of bicycle retailers
Gaspésie	5
Bas-Saint-Laurent	13
Chaudière—Appalaches	24
Estrie	29
Montérégie	145
Montréal	150
Laval	27
Outaouais	26
Laurentides	74
Lanaudière	39
Mauricie—Bois-Francs	67
Abitibi—Témiscamingue	12
Saguenay—Lac-Saint-Jean	29
Québec	60
Côte-Nord	7
TOTAL	**707**

Source : B.J. Hunter (1995).

Bicycle manufacturing industry

The development of Québec's bicycle manufacturing industry is a recent phenomenon. Although Victoria Précision has been in existence since 1940, it originally derived most of its sales from the production of parts for the aeronautics industry. Inherently linked to the popularity of cycling, the growth of the bicycle manufacturing industry really began in the early 1970s, and the sector has expanded steadily over the past 30 years. It is interesting to note that the five companies listed in the following table produce, as a whole, nearly 800 000 bicycles a year in Québec. Given that 400 000 bicycles are sold annually in the province and that half of them (200 000) are imported, it follows that 75% of the bicycles produced by these companies (600 000) are exported. Although most are usually destined for other Canadian provinces, a growing number tend to be sold abroad, mainly to Europe and the United States. The bicycle manufacturing industry employs nearly 1 300 people, not including those who manufacture bicycle accessories and equipment.

Table 6

Québec's bicycle manufacturing industry

Company	Annual production	Trade-marks	Price range	Number of employees	Sales figure	Québec market	Canadian market	Foreign market
Bicyclette Cyclo	N/A	CycloStorm	N/A	16	N/A	100%	—	—
Cycles Devinci	1 000 (bicycles) 3 000 (frames)	Devinci	$850 to $4 000	15 to 25	N/A	80%	—	20% France
Groupe Procycle	300 000 to 400 000	CCM, Mikado, Oryx, Peugeot, Vélo Sport	$80 to $3 000	450 (9 months a year)	$50 M	26%	68%	6% (U.S.)
Raleigh Industries of Canada	230 000	Raleigh	$200 to $600	395	N/A	N/A	N/A	N/A
Victoria Précision	200 000 or+	Leader, Minelli, Précision	$200 to $500	450 (6 months a year)	$32 M	36%	64%	—

Bicycle equipment

Regardless of the type of bicycle used (hybrid, mountain, city, or road), it is interesting to study the various types of equipment that may be installed on these models. Under the Highway Safety Code, all bicycles are supposed to be equipped with lights and reflectors. However, following the reform of the Code, retailers will be obliged, beginning in 1997, only to install reflectors at the time of sale.

Based on the Décarie & Complices survey, the presence of reflectors (on front and back wheels) seems to be fairly common: at least 80% of bicycles were reported to have reflectors. Although it may be difficult to measure gains over the short term, the requirement brought into effect by the reform of the Highway Safety Code should raise this percentage over the medium and the long term.

The use of lighting systems, contrary to that of reflectors, is fairly limited (10%). Québec still lags far behind Denmark or the Netherlands, where it is almost inconceivable to ride a bicycle at night unless it is equipped with an active lighting system. Nevertheless, we can assume that such devices will probably be used to a greater extent here in the coming years, owing to the recent development of new systems that can be readily installed.

The extent to which cyclists use different types of equipment also depends on the latter's availability. For example, several pieces of equipment and accessories not commonly available were used only

rarely not so long ago. Equipment such as baskets and baggage racks, for transporting personal effects or food, are now found on 27% of bicycles, while odometers, which were practically non-existent 10 years ago, are found on 12%. In addition, 79% of cyclists with children aged 0 to 6 currently have a child's seat or a trailer (11% of total bicycles). This bears witness to the large number of people who continue to bicycle even though they have young children, and to the effort they make to acquire the right equipment for bringing their children along with them.

BICYCLE USE

Bicycle use in Québec in 1995 was measured by conducting a survey of the general public, counting the number of cyclists on certain bikeways and polling various categories of bicycle users. The survey of the general public made it possible to gather general data on bicycle use, such as number of cyclists; frequency, location and length of trips; distance travelled; trip purpose and so forth. As for the counting activities, they furnished data on levels of bicycling over periods of several months at specific points on the bikeways concerned. To complete this portrait of bicycle use, this section provides a description of organized cycling activities and bicycle touring, and discusses the use of bicycles as work vehicles. Over the past 10 years, there has been a sharp increase in the number of public cycling events, while more recently, multiple-day event rides have made remarkable inroads on Québec's tourism market. In addition, over the past decade or so, couriers and police officers have shown a renewed interest in using bicycles on the job. To begin this section, we will take a brief look at general changes in the use of bicycles over the past 20 years.

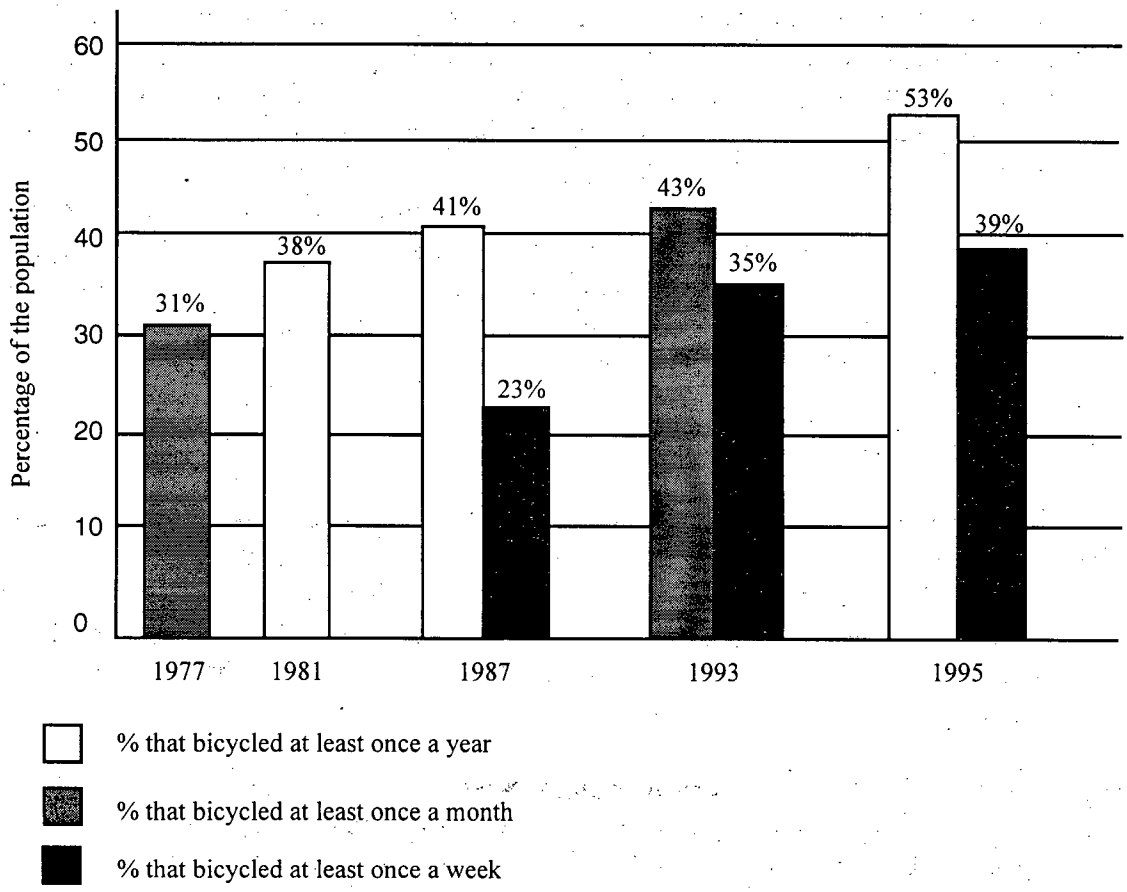
Changes over the past 20 years

Around 10 studies conducted in Québec and Canada may be used to measure fluctuations in bicycling levels since the early 1970s. Even though they sometimes employ different terms (excursion, ride, etc.) and reference periods, all show that there has been a net increase in bicycling in Québec and that people have become more interested in health and physical exercise. In addition, Quebecers have developed new bicycle transportation habits, with the result that the bicycle has become more than just a recreational vehicle.

The growing popularity of cycling is reflected by, among other things, a 39% increase in the number of people who bicycle at least once a year (occasional users). An even greater increase, i.e. 68% from 1987 to 1995, has been observed among people who ride at least once a week.

Figure 1

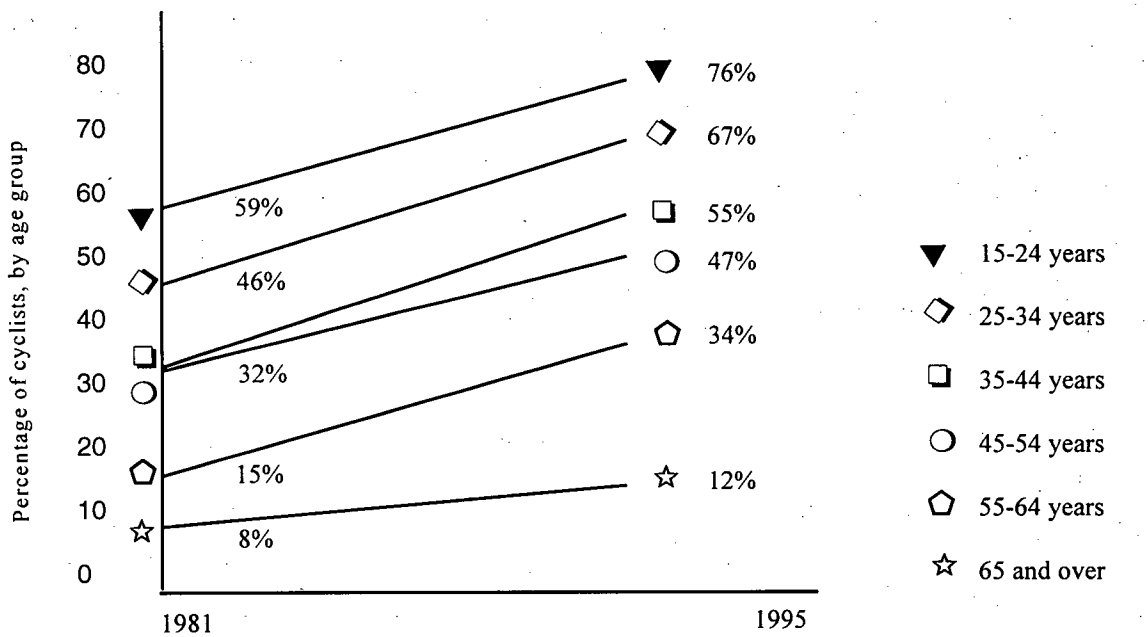
Number of cyclists in Québec between 1977 and 1995, as a percentage of the population



There has also been a substantial increase in bicycling among all age groups. In 1981, the 15-24 and 25-34 age groups were the only ones in which the number of cyclists exceeded 45%. However, by 1995, similar levels were also observed among people aged 35-44 and 45-54. This reflects the fact that the members of these last two age groups, which correspond to the baby-boomers and account for a large share of the population, prefer non-organized activities such as cycling on account of their heavy schedules. Given Quebecers' growing interest in health and physical fitness and the fact that cycling can be carried out almost anywhere at any time, there should be an increase in participation rates among all age groups for several years to come.

Figure 2

Percentage of cyclists, by age group



Note : In 1981, the data for the 35-44 and 45-54 age groups were not compiled separately.

Current situation

Bicycles are omnipresent in Québec. Used for family recreation, touring and transportation purposes, they are found not only deep in the woods but on downtown streets, bicycle paths and highways. The portrait of bicycling presented in this section includes information on cyclists, trip patterns and bicycle use. Unless otherwise indicated, the data come from the Décarie & Complices survey (1995) and from counts done on bikeways in various parts of Québec during the summer of 1996.

Profile of Québec cyclists

Number

By definition, a cyclist is a person who bicycles. In Québec, one person in two rode a bicycle at least once in 1995. Even more significantly, more than one adult in three bicycled at least once a week from May to September.

Table 7

Number of cyclists in Québec

Source	Age group	Number of people in age group*	Number of cyclists in age group	Percentage of the population
Descarie & complices, 1995	18-74 years	5 376 000	2 849 000	53%
Ministère de l'Éducation, 1994 (1993 data)	12-17 years	591 000	526 000	89%
Impact Recherche, 1993	6-11 years	541 000	298 000	55%**
	Total (6-74 years)	**6 508 000**	**3 644 000**	**56%**
	Total population of Québec	**7 334 000**		

* Calculated on the basis of Statistics Canada population data for 1995.

** Comparisons with other studies tend to indicate that this figure, which is the only one available for this age group, is probably too low.

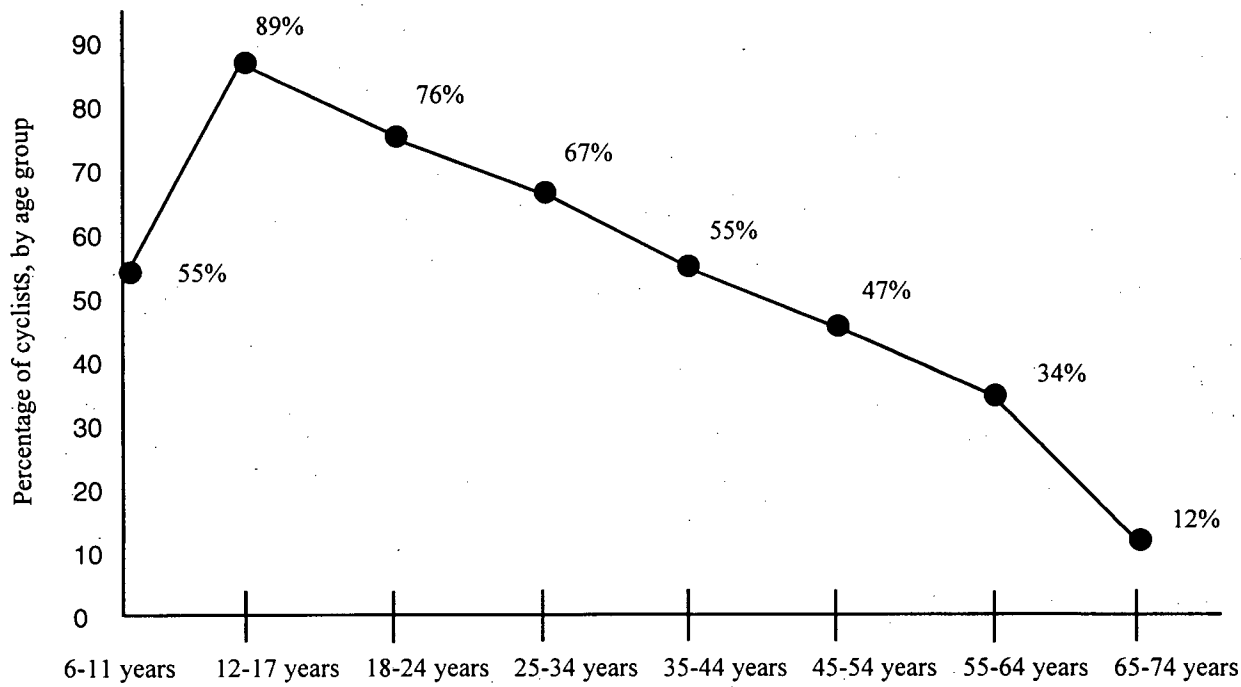
It is interesting to note that although 53% of adults (18-74 age group) rode a bicycle at least once in 1995, 62% owned a bicycle and 86% had used one at least once in their life. This indicates that there is a large pool of potential bicycle users who might join the ranks of active cyclists.

Age and sex

Two main factors affect the distribution of cyclists by age and sex. First, cycling is a physical activity. According to the studies we consulted, men are more physically active than women, and physical activity declines with age. In 1995, 59% of men between the ages of 18 and 74 cycled, compared with 47% of women in the same age group. Second, the bicycle is often one of the only modes of transport available to young people under 16 years of age and, to a lesser extent, to people between the ages of 16 and 24. This is due to the fact that the former are too young to drive a car, while the latter cannot afford to buy one.

Figure 3

Percentage of cyclists, by age group, in 1995



Trip habits

The bicycle is an unobtrusive vehicle for which trip data are not easy to compile. First of all, just over 10% of bicycles are equipped with an odometer, and second, it is impossible to establish a relationship, in the case of bicycles, between fuel consumption and distance travelled as can be done for automobiles. Lastly, there is no clear relationship between the wear-out of certain parts (or the sale of new ones) and distances travelled. Under these circumstances, the ideal solution would be to have access to the results of origin-destination surveys conducted by public transit authorities.

These surveys provide information on the number, length and distance of trips made by people in a given area, according to origin and destination. The scope of this type of study is clearly illustrated by the number of households polled during the most recent survey carried out by the Société de transport de la Communauté urbaine de Montréal (STCUM) in 1993, i.e. 60 000. However, the main problem with origin-destination studies is that they are conducted when public transit use is at its peak, i.e. from September to November, which corresponds to the period when bicycle use declines. In addition, the kind of trips recorded are those that involve a starting point, a destination and a purpose, which excludes trips that are strictly for pleasure—a type of trip rarely made by car or public transit but often by bicycle. Despite these drawbacks, origin-destination surveys provide certain interesting information.

To determine the frequency and length of trips as well as distances travelled, it is necessary to analyse the behaviour of cyclists themselves. In the present study, this was done by conducting a telephone

survey of 1 500 respondents throughout Québec (Décarie & Complices 1995) and by counting the number of cyclists who used bikeways in the summer of 1996. The counts, which were done by observers or automatic counting machines, made it possible to establish the number of cyclists who passed a particular point on the bikeways and to record additional information concerning sex, age and so forth.

Bicycle trip data make it possible to quantify bicycle use. Although the increase in the number of cyclists over the past 20 years can be said to reflect a trend towards more bicycle use, an even clearer indication is provided the fact that the number of bicycle trips increased by 20% from 1982 to 1987 in the Montréal area and by 70% in the downtown core, while the number of walking trips fell during the same period. The number of bicycle trips was even one and a half times that of taxi trips in 1987, a situation that has probably since evolved in favour of bicycles (Chapleau 1994).

To prepare a more global portrait of bicycling in Québec, it is necessary to consider trips made by cyclists from May to September, including weekends, since most bicycle trips are made during those periods. The situation in all Québec regions must also be taken into account. These were the objectives of the survey and counting activities conducted during the present study, whose results are analyzed below.

Evaluation of trip indicators

Until now, data have been available on the number of cyclists but not on their mobility. The cyclist population data only made it possible to calculate accident rates per 100 000 inhabitants or 100 000 cyclists, but did not provide a valid basis for determining accident exposure rates. The number of accidents per 100 000 inhabitants varies according to the number of cyclists. Likewise, the number of accidents per 100 000 cyclists varies according to distances travelled.

On the basis of our study (Décarie & Complices 1995), it is possible to evaluate three types of cyclist mobility indicators:

- trip frequency;
- trip length;
- distance travelled.

An average may be obtained for each of these indicators, per cyclist, for a given period (week, year). Comparisons may then be made over time or with other modes of transport. It is even possible to calculate the total distance travelled by cyclists as a whole. Such data could eventually be used to establish accident rates per million kilometres travelled and to compare them over time or with the rates observed in other countries or regions.

Four questions in the Décarie & Complices survey (1995) dealt with the frequency and length of trips made by each cyclist, and particularly with weekly averages for these two indicators from May to September 1995. Respondents had to provide this information for six types of bicycle facilities and for two trip purposes. The following table summarizes their answers to these questions.

Table 8

Trip frequency and length

Type of facility*	Average number of trips per week	Average length of each trip (minutes)	Average length of trips per week (minutes)
Bicycle path	1.5	47.4	71
Streets with light traffic	2.6	33.5	87
Streets with heavy traffic	0.8	8.8	7
Rural roads with light traffic	1.1	19.7	22
Rural roads with heavy traffic	0.3	3.4	1
Mountain trails or roads	0.4	21.1	8
Total for all types of facilities	**6.7**	**29.3**	**196**

* Décarie & Complices 1995 - Questions 11 and 12.

Tip purpose*	Average number of trips per week	Average length of each trip (minutes)	Average length of trips per week (minutes)
Recreational	3.2	68.4	219
Utilitarian	1.8	29.7	53
Total for all purposes	**5.0**		**272**

* Décarie & Complices 1995 - Questions 13 and 14.

The figures pertaining to number of trips per week and the average length of each trip were obtained by averaging the survey results for cyclists as a whole. These figures were then used to calculate the average length of trips per week.

On the basis of the estimates provided by the cyclists polled, the total length of trips per week ranges from 196 minutes, when all trips for each type of facility are taken into account, to 272 minutes, when all trips for each purpose are considered. This difference may be explained by various factors, including the fact that the questions concerned a five-month period. The ability to remember events accurately is known to diminish with the amount of time that elapses after the events took place.

With this data, it was possible to calculate the average distance travelled by cyclists per week. For this purpose, an average speed of 12km/h was used for urban areas and 20 km/h for rural areas. The way in which these speeds were obtained is explained in Appendix I (Volume II).

Table 9

Average distance travelled by cyclists per week

Type of facility*	Average length of trips per week (minutes)	Average speed (km/h)	Average distance travelled per week (km)
Bicycle path	71	12	14
Streets with light traffic	87	12	17
Streets with heavy traffic	7	12	1
Rural roads with light traffic	22	20	7
Rural roads with heavy traffic	1	20	0
Mountain trails or roads	8	12	2
Total for all types of facilities			**42**

* Décarie & Complices 1995 - Questions 11 and 12.

Trip purpose*	Average length of trips per week (minutes)	Average speed (km/h)	Average distance travelled per week (km)
Recreational	219	12	44
Utilitarian	53	12	11
Total for all pourposes			**54**

* Décarie & Complices, 1995 - Questions 13 and 14.

Based on the distances travelled per type of facility, we can assert that cyclists have a definite preference for bicycle paths, followed by streets with a low volume of automobile traffic. This situation is quite remarkable, considering that Québec's bike path system is 20 times smaller than the street network.[1] The popular verdict is very clear: people would rather bicycle where there are fewer cars and traffic speeds are lower. Bicycles and automobiles can co-exist when there is enough room for bikes and cars drive slowly, as is the case on streets and roads with light traffic. In other words, people prefer bicycle paths, or streets and roads with specially designed features such as paved shoulders, bicycle lanes and so forth.

Based on the average distances travelled by the cyclists polled during the survey, we were able to calculate the total number of kilometres travelled on Québec's road network by cyclists as a whole.

[1] The ministère des Transports estimates that the total length of the street network in Québec municipalities is 50 000 km, while the *Répertoire des voies cyclables du Québec*, published by Les Éditions Tricycle, sets the total length of the bike path system at 2 600 km.

It should be emphasized that the result obtained for this indicator constitutes an approximation. A more in-depth study would be needed to obtain a precise figure.

Table 10

Total distance travelled by cyclists from May to September 1995

Average distance travelled by each cyclist per week (km)	Number of weeks	Total number of cyclists aged 18 to 74	Total distance travelled by cyclists from May to Septembre
42	22	2 849 000	2,6 milliards de km

If the distances travelled during the other months of the year, notably April and October—when the number of cyclists is fairly high—are added to this total, we estimate that Québec cyclists as a whole travel approximately 3 billion km per year.

Purpose of trips

Bicycles are used for utilitarian or recreational purposes. In Québec, 65% of bicycle trips are recreational, and the average length of such trips is twice that of utilitarian ones.

In addition, 79% of cyclists use their bicycle solely for recreation, while 13% occasionally use it as a means of transportation and 8% as their primary mode of transport. Since using a bicycle for transportation does not exclude recreational use, it can be asserted that bicycles serve as recreational vehicles for the vast majority of cyclists.

It should be stressed, however, that a large number of cyclists, i.e 21% of cyclists aged 18 to 74, or nearly 600 000 people, use bicycles for utilitarian purposes. It should also be noted that they make far more bicycle trips than other cyclists, given that 35% of trips are utilitarian.

Bikeway use

Knowing the extent to which major bikeways are used helps to ensure that bicycle network development is better planned and facilitates research into bicycle transportation and safety. The methods employed to measure cycling levels on these facilities are more or less the same as those used to measure automobile traffic: cyclists are counted manually by observers, or automatically by machines. So far, a limited number of counts have been conducted in Québec, notably in Montréal by the City of Montréal, and on the path along the Beauport flats in the vicinity of Québec City by the ministère des Transports. A few less extensive evaluations have also been carried out, particularly on the Lachine Canal path and Victoria Bridge in Montréal.

Cyclist counts were made during the present study to obtain additional data for evaluating use levels on typical bicycle facilities and for identifying a users' profile: relative number of cyclists, in-line

skaters and pedestrians, as well as their sex, age and so forth. Two methods were used to collect the data:

- the different types of users identified on each facility (cyclists, in-line skaters and pedestrians, where applicable) were counted manually, while recording the characteristics of each individual (sex, age and whether he or she was wearing a bicycle helmet);
- the number of users was counted automatically over the entire counting period.

The counts were conducted from July to October 1996 on three bikeways that are part of major networks or axes and were therefore likely to be used by a fairly large number of people. The characteristics of the three facilities varied in terms of the region and type of environment (urban, peri-urban or resort) in which they were located.

Table 11

Counting sites selected in 1996

Region	Bikeway	Characteristics
Estrie	Lennoxville—North-Hatley axis	- Peri-urban environment (Lennoxville) - Multi-use, 12-km trail - Inaugurated in 1994
Laurentides	P'tit Train du Nord linear park	- Resort environment - Multi-use, 200-km trail - Inaugurated in 1995
Mauricie—Bois-Francs	Trois-Rivières linear park	- Urban environment - Bicycle path between downtown and the Forges du Saint-Maurice

In addition to providing data on cycling levels on these three bikeways, which can serve as a baseline for measuring changes in bicycle use, these counts made it possible to check the validity of the automatic count data and to assess the impact of weather conditions on bicycle use.

1995 and 1996 count data

Detailed results of the counting operations are shown in Appendix 3 (Volume II). This section presents the main information that we have been able to derive from this data.

Laurentides

Site	P'tit Train du Nord linear park, Mont-Rolland
Type of count	Automatic, 24 hours a day, using pneumatic counters
Period	July 7 to October 13, 1996

- Over 78 000 cyclists passed the counting site during the 87-day counting period, or an average of 863 per day. Given that cyclists almost always do a round trip, we can conclude that 39 000 cyclists visited the linear park in the Mont-Rolland sector alone.
- An average of 1 766 cyclists passed the counting site on Sundays, 1 477 on Saturdays and 560 on weekdays.

Estrie

Site	Grandes Fourches network, Lennoxville—North-Hatley section
Type of count	Automatic, 24 hours a day, using pneumatic counters
Period	July 7 to August 20, 1996

- A total of 30 800 cyclists passed the counting site during the 45-day counting period, or an average of 779 per day.
- An average of 1 604 cyclists passed the counting site on Sundays, 891 on Saturdays and 594 on weekdays.

Mauricie

Site	Trois-Rivières linear park
Type of count	Manuel, 8 hours a day
Period	July to October 1996

- A total of nearly 10 000 cyclists passed the counting site over the following 15 days (Fridays, Saturdays and Sundays): July 12, 13 and 14; August 2, 3, 4, 23, 24 and 25; September 13, 14 and 15; and October 4, 5 and 6. This corresponds to an average of 662 cyclists per day.
- In July and August, an average of 1 087 cyclists passed the counting site on Sundays, 1 046 on Saturdays and 646 on Fridays.

Québec City

Site	Path along the Beauport flats
Type of count	Automatic, 24 hours a day, using loop detectors
Period	August 3 to 13, 1995

- A total of over 19 000 cyclists passed the counting site during the 11-day counting period, or an average of 1 749 per day.
- An average of 2 506 cyclists passed the counting site on weekends and 1 609 on weekdays.

Montréal

Site	City bikeway network
Type of count	Automatic, 24 hours a day, using pneumatic counters
Period	June to July 1991, July 1993, July and August 1996

- Montréal's bikeways are used extensively:
  - on the north-south axis at the level of Rue Rachel, over 3 900 cyclists passed the counting site per day during the week, with peaks of 5 000 cyclists;
  - on the bicycle lane along Rue Rachel, over 2 700 cyclists passed the counting site per day during the week, with peaks of 3 300 cyclists;
  - on the bicycle lane along Boulevard René-Lévesque, 1 400 cyclists passed the counting site per day during the week, with peaks of 2 300 cyclists.
- Hourly peaks of up to 500 cyclists were recorded in various parts of the network, which is remarkable considering that Montréal's bike lanes are generally only 3 metres wide.
- At the level of Rue Rachel on the north-south axis, we estimate that over 500 000 cyclists pass the counting site per year. It is therefore reasonable to conclude that, on average, nearly 4 000 cyclists pass the counting site per day in June, July and August, half as many in May and September and several hundred in April and October.
- According to manual counts by the Société du parc des Îles, over 200 000 cyclists crossed the St. Lawrence River via the sidewalk on Victoria Bridge between Montréal and Saint-Lambert from May 1 to October 10, 1995.

Main characteristics of bikeway use in the Laurentides, Estrie and Trois-Rivières

- Bikeway use is fairly stable in July and August and declines on weekdays in September.

- The number of cyclists using bikeways on Sundays is roughly three times as high as on weekdays. The number found on the P'tit Train du Nord trail (resort area) on Saturdays corresponds to nearly 85% of that observed on Sundays, while the number using the Lennoxville trail (peri-urban environment) on Saturdays amounts to only 56% of that recorded on Sundays.

- In the Laurentides region, bikeway use is concentrated between 10:00 a.m. and 4:00 p.m., with a sharp peak between 1:00 p.m. and 3:00 p.m. This is probably because the trail is used solely for recreational purposes and there is no major population centre in the vicinity. In Trois-Rivières, where the bike path is in an urban environment, bicycle use is higher between 3:00 p.m. and 6:00 p.m. than between 12:00 p.m. and 3:00 p.m.

- Roughly the same number of cyclists were counted in both directions on each of the bicycle facilities studied. It is probable, therefore, that almost all cyclists make round trips.

- There are no in-line skaters on the stone-dust trails of P'tit Train du Nord and Lennoxville, while they account for 25% of users on the asphalt path in Trois-Rivières.

- The male/female ratio varies depending on the bikeway concerned: 33% of cyclists on the Trois-Rivières path are women, compared with 40% on the P'tit Train du Nord trail and 45% on the Lennoxville facility.

- The age of cyclists seems to vary depending on the proximity of cities. People between the ages of 15 and 54 represent 64% of users in Trois-Rivières, 78% in Lennoxville and 89% in the P'tit Train du Nord linear park. This is probably because children and older people have readier access to the Trois-Rivières bike path, which is located in an urban environment, and to the Lennoxville trail, which is situated in a peri-urban environment, than they do to the P'tit Train du Nord linear park, which most cyclists reach by car.

Main characteristics of bikeway use in Montréal

- Two very different models of bikeway use were observed at all counting sites: one during the week and the other on weekends.

    - On weekdays, bikeway use is characterized by a peak in the morning, with a maximum hourly volume of bicycle traffic between 8:00 a.m. and 9:00 a.m. and volumes increasing as of 10:00 a.m., to an hourly peak between 5:00 p.m. and 6:00 p.m. (double the morning peak). The high volume of traffic in the late afternoon may be explained by the arrival of two types of users who are absent in the morning: recreational riders, and cyclists who do not bicycle to work but who use this mode of transport at the end of the day to go shopping or make other utilitarian trips.
    - On weekends and holidays, the bikeway network is used for recreational purposes: use patterns follow a normal, or bell-shaped, curve, similar to that recorded on regional bike paths, with a peak between 2:00 p.m. and 5:00 p.m.

- In the central parts of the network, a third peak occurs every evening during the week, from 9:00 p.m. to 10:00 p.m. This phenomenon may be observed not only on the bicycle lanes along Boulevard René-Lévesque and Rue Rachel, but also on the north-south axis, from the Old Port to Rue Rachel.

- In 1996, bikeway use was higher on weekdays than during the weekend at all counting sites, except those located near or on the periphery of large recreational areas, namely, the Old Port, Parc du Mont-Royal and Rivières des Prairies.

- The bikeway network is used most extensively in the Plateau Mont-Royal area, not only because residents to the north and east of this part of the network cross it when they go downtown, but probably because the bicycle is a popular mode of transport in this sector.

- Since 1991, use levels on weekdays have increased by roughly 20% throughout most of the bikeway network, except in its northernmost section, even though almost no changes were made to these facilities over that period.

- Since 1991 as well, use levels on weekends have declined to varying degrees (by up to 30% in the most seriously affected areas), except in the northernmost part, where they have increased. It should be noted that, over the same period, bikeway networks developed rapidly in peripheral regions, offering good opportunities for recreational cycling.

Validity of automatic count data

The validity of data collected using automatic counters can be verified by comparing it with that gathered by manual counts over the same period at the same counting site. A comparison of this type is presented in Appendix 3 (Volume II) using the data collected on the P'tit Train du Nord trail on October 6, 1996, when both manual and automatic counts were made every hour. The very high correlation between the results obtained using the two counting methods indicates that the type of automatic counter used was very reliable. A pneumatic device, it records the number of air impulses generated when wheels pass over a round rubber hose that operates according to the same principle as a service-station signal hose. Designed to count automobiles, this type of counter provides accurate bicycle counts on stone-dust surfaces. It would be useful to check whether this pneumatic device and other types of counters are equally effective on asphalt surfaces, where hoses have a tendency to roll under bicycle wheels.

Impact of weather conditions

Since cyclists are not protected by a compartment, they are exposed to the elements. It is commonly held, therefore, that only nice summer days are suitable for cycling. However, an analysis of the data gathered on the P'tit Train du Nord trail shows that the situation is more complex (See the figures for daily use patterns and weather conditions recorded from July 11 to October 13, 1996 (Appendix 3, Volume II)). It is true that heavy rain has a direct impact on the use of recreational bikeways. It can be noted, for example, that fewer than 100 cyclists used the P'tit Train du Nord trail on Wednesday, July 31, when 23 mm of rain fell; in comparison, over 1 500 people had bicycled there one week earlier. However, the relationship between temperature and number of cyclists is much less clear. The decline observed in the number of people using the trail on weekdays—from a daily average of

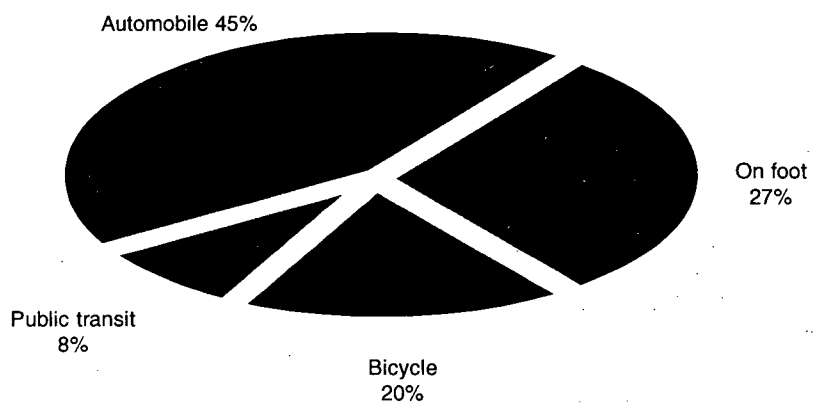
slightly over 1 000 in July and August to around 500 in September—is probably due more to the end of the holiday period than to the decline in temperature. The number of cyclists using the bikeway on weekends was just as high in September as it was during the summer, with the busiest summer day being the Sunday of Labour Day weekend, when nearly 3 700 cyclists passed the counting site. Close to 2 000 cyclists were recorded on Sunday, October, 6, despite a maximum temperature of only 11°C.

Other modes of transport

To optimize bicycle use, it is necessary to understand how it compares with the use of other means of transportation. Similarly, to identify situations where bicycling could be promoted or to pinpoint constraining factors, it is useful to look at how cyclists travel when they do not use a bicycle. Based on the total number of trips made per week during the reference period using various means of transportation, we can assert that cyclists use a bicycle for 20% of their trips. The rest of the time, they travel by car (45%), walk (27%) or take public transit (8%). People who use a bicycle as their main mode of transport are among those who walk or use public transit most often.

Figure 4

Breakdown of cyclists' trips, by mode of transport



Organized activities

This section provides a general description of the main types of bicycle use, along with supporting data. Recreational riding accounts for a large share of bicycle use, and one of its main advantages is that it can be carried out as part of organized or non-organized recreational activities.

Cycling clubs

Cycling clubs are not merely indicative of people's need to socialize, but reflect the extent to which many Quebecers have developed a passion for cycling. Of course, there will always be people who prefer to bicycle alone. However, according to the Regroupement provincial des clubs cyclistes,

around 50 bicycling clubs are probably active in the province every year, including mountain biking clubs. For the purposes of this study, we identified 50 clubs that were active in 1996. Twenty-six provided us with data on membership levels and the number of outings their club organized. Six were racing clubs and had a total of 104 active members, who took part in Québec's competitive cycling circuit. The other 20 organized non-competitive rides and had a membership of 40 to 150. The largest cycling clubs have over 1 000 members.

Public cycling events

According to the *Directory of Canada's Bicycle Rides*, cyclists were invited to participate in 34 one-day public cycling events in Québec during the summer of 1995, i.e from mid-May to mid-September. Three of the events were being held for the first time, while the 31 others were repeats of rides organized in previous years. In 1994, over 110 000 cyclists took part in the 31 cycling events available at the time, pedalling a total of over 5 million km. Three million of these kilometres were covered during the Tour de l'Île de Montréal alone (Appendix 4, Volume II).

Bicycle touring

Bicycle touring is generally defined as any bicycle trip involving at least one night away from home. It includes cycling packages organized by the hotel industry, traditional tours for small groups, multiple-day event rides, vacations where people stay in a hotel or motel of their choice and make bicycle excursions from there and, of course, the classic form of bicycle touring, independent cycling trips.

Portrait of bicycle tourists

The following statistics were derived from answers to three questions on bicycle touring in the Décarie & Complices survey (1995):

- Forty-three of the 721 cyclists polled said they went bicycle touring. This corresponds to 6% of total cyclists, or 3% of the population.
- Bicycle tourists go on an average of 1.7 excursions each.
- On average, excursions last 3.2 days and include slightly more than 2 overnight stays.
- The average distance travelled is 37 km per day, or nearly 120 km per excursion.

Since these figures were calculated on the basis of a limited sample, they must be interpreted with caution. Nevertheless, when the number of overnight stays recorded during bicycle tours alone, i.e. over 20 000, is applied to the total number of bicycle tourists in Québec, we estimate that Quebecers spend 100 000 nights away from home per year while bicycle touring.

Tourism product

Bicycling is an increasingly popular tourism product. For example, in just two or three years, bicycle tours and "bicycling and accommodations" packages have emerged. In the first case, tour operators or a group of hoteliers provide lodgings, two meals a day and baggage transportation between points of accommodation for tourists travelling by bicycle. In the second case, participants are provided with bicycles, as well as accommodations usually located near a regional bike path. Few data are available on the supply of such products, which is limited for the time being. Nevertheless, on the basis of a brief survey, we can assert that over 30 or so packages were offered in 1996. The situation could change very rapidly, however, based on what has happened in the case of multiple-day event rides. These rides include baggage transportation, two or three meals a day and usually campground accommodations, although a limited number of participants may stay in hotels. This type of event has undergone extraordinary development in recent years, following a trend that first emerged in the United States and Australia. Since 1993, the number of participants has risen by an average of over 1 000 per year, reaching a peak of 5 000 in 1996, while the number of overnight stays has increased from around 1 000 to nearly 22 000.

Table 12

Multiple-day event rides: number of participants and overnight stays

Ride	First edition	Overnight stays	Participants/Overnight stays							
			1993		1994		1995		1996	
Tour du Lac à vélo pour l'Afrique	1987	2	330	660	405	810	469	938	550	1 100
Vélo-Trans-Québec	1995	2	—	—	—	—	95	190	167	334
Beauce à Vélo	1996	4	—	—	—	—	—	—	500	2 000
Vélotour de la sclérose en plaques, Foresterie Noranda	1989	1	474	474	441	441	537	537	456	456
Grand Tour	1994	7	—	—	1 150	8 050	2 000	14 000	1 900	13 300
Petite Aventure	1996	2	—	—	—	—	—	—	710	1 420
Tour des Cantons	1996	5	—	—	—	—	—	—	675	3 375
TOTAL										
Number of participants			804		1996		3 101		4 958	
Number of overnight stays				1 134		9 301		15 665		21 985

Source : Tour de l'île de Montréal and Vélo Québec.

Use of bicycles as work vehicles

Bicycle couriers

The growing popularity of bicycle courier service can be readily observed in North American cities. In Québec, such services are particularly widespread in the city of Montréal. Twenty-six of the 76 courier firms in the Montréal area offer bicycle service. They employ 140 cyclists, who each deliver an average of 15 to 50 parcels and letters a day, depending on the distances that have to be travelled. This represents over 3 500 deliveries per day. In Québec City, the only company that offers bicycle courier service makes all of its deliveries by bike and employs 5 to 10 cyclists, depending on the time of year. Vélo Service does not require a signature on the reception of items, and cyclists deliver an average of 20 to 40 letters an hour. Although Hull does not have any bicycle courier firms as such, certain companies in Ottawa offer bicycle service and make regular deliveries to Hull.

Bicycle officers

The bicycle is making a come-back as a patrol vehicle in police departments, after falling into disuse for over 30 years. This trend first emerged on the west coast of the United States and has now spread to the rest of the country. In 1991, there were already as many as 515 bicycle officers in the United States as a whole. In 1996, over 700 officers used bicycles as patrol vehicles in New York State alone (*Bicycle Federation of America,* 1996). Law enforcement authorities and police officers see many advantages to using bicycles. This means of transportation facilitates contacts with the general public and makes it easier to reach isolated spots such as parks, bike paths and wooded areas. Much of the work done by bicycle officers involves community action, through education, awareness and prevention programs and activities. In general, these officers patrol municipal bikeways, streets and parks.

The following list includes the police departments of the Communauté urbaine de Montréal (CUM) and the 24 most heavily populated municipalities in Québec. Thirteen have police bicycle patrols, three of which employ police technology students, who work under the supervision of the police department for the summer. Most of the time, bicycle officers patrol in pairs, except in Chicoutimi and Terrebonne, where they sometimes work alone.

Table 13

Use of bicycles by police departments

City	Number of bicycle officers	Number of bicycle available
Brossard	2	2
Châteauguay	3	3
Chicoutimi	3	3
CUM	93	69
Gatineau	3	2
Hull	2	2
Longueuil	3	3
Québec	5	5
Sherbrooke	1996 : 6 students	N/A
	1995 : 2 officers	2
Saint-Jean-sur-Richelieu	2 students	2
Terrebonne	2	2
Saint-Eustache	2	2
Sainte-Foy/Cap-Rouge	10	4
Saint-Hubert	2	2
Saint-Hyacinthe	2 students	2
Trois-Rivières	15	2

Main duties of bicycle officers

- conducting awareness tours (schools, playgrounds and shopping centres);
- setting up information stands;
- engraving ID on bicycles;
- escorting groups;
- attending special events;
- patrolling bicycle paths;
- answering emergency calls in parks and on bike paths;
- answering calls following injuries and accidents;
- repairing bicycles;
- providing tourist information;
- issuing statements of offence to cyclists and motorists under municipal by-laws and the Highway Safety Code;
- making arrests.

Civilian patrols

Several cities that do not have a police bicycle patrol or that wish to supplement the activities of an existing one recruit civilian volunteers to patrol their bike path network. Hull, Québec City and Sherbrooke have civilian patrols that are responsible for enforcing rules and regulations, administering first aid, doing minor bicycle repairs, providing tourist information and carrying out education and prevention activities. Most civilian patrols receive bicycle-officer training.

Parking-control officers

Since the fall of 1995, the parking-control officers of the City of Montréal have had 10 bicycles at their disposal for carrying out their duties with regard to parking infractions.

Delivery people

In congested urban areas in Québec, grocery stores still deliver groceries by bicycle. We noted, for example, on the basis of a random sample of about 40 grocery and convenience stores in Montréal, that roughly 10 stores (nearly 25%) had delivery bicycles. These businesses were located in the following municipalities and districts: Verdun, Centre-Est, Ahuntsic, Lachine, Villeray, Plateau Mont-Royal, Hochelaga-Maisonneuve and Mile-End.

Quilicot, a renowned tricycle manufacturer, sells around 30 tricycles a year, mainly to grocery stores and to businesses that have warehouses or factories.

FACILITIES AND SERVICES

Road network and bikeways

A quick look at Québec's road map provides a clear picture of the province's road network. The most bicycle friendly section, i.e. the local collector and regional road system, is located primarily in the immediate vicinity of the St. Lawrence Valley and the area further south stretching to the U.S. border. These roads, coupled with the municipal street network, form the basic part of the road system that may be used by cyclists. There is also the bikeway network strictly speaking, which is discussed below.

Local roads are the most suitable for cycling on account of their function, speed limit (70 or 80 km/h) and low volume of traffic. These roads often serve as designated roadways when they are integrated into bicycle routes.

Even though primary roads are used by cyclists, they are a priori less bicycle friendly, since their geometry-wider curves, gentler maximum slopes and so forth-promotes higher speeds (90 km/h). From a cyclist's viewpoint, high speeds, a lack of paved shoulders and a high volume of car and heavy vehicle traffic are the main obstacles to safety and comfort. Prior to 1993, no special measures were implemented, except in a few specific cases, to make the geometry of primary roads safer for all users, including cyclists. That year, however, the ministère des Transports introduced standards for paving shoulders on busy roads.

Moreover, in accordance with its *Bicycle Policy*, the department has adhered since 1995 to the principle of improving bicycle safety on roads under its management by paving shoulders along designated bike routes.

According to the *Répertoire des voies cyclables du Québec* (1996), the bikeway network strictly speaking (bike paths, bicycle lanes and designated roadways) covers 2 315 km. It includes 1 287 km of intermunicipal bikeways and 1 729 km of facilities located within municipal boundaries. The Laurentides administrative region encompasses the largest section of intermunicipal bikeways, covering 324 km, 200 km of which are comprised by the P'tit Train du Nord linear park. The longest urban bikeway systems are found in Montréal, Québec City, Trois-Rivières and the cities in the Outaouais region.

Table 14

Length of Québec's bikeway network, by administrative region

Region	Present length (km)			Projected length (km)		
	Path	Lane	Designated roadway	Path	Lane	Designated roadway
Gaspésie	11	7				
Bas-Saint-Laurent	140			3		
Chaudières—Appalaches	19	4		45	6	
Estrie	131	26	63	25	4	
Montérégie	256	130	76	66	29	3
Montréal	193	58	50		2	
Laval	12	36	3		0	
Outaouais	77	13	0	155	5	
Laurentides	307	87	11		2	
Lanaudière	14	43	15	10	8	
Coeur-du-Québec	114	63	45	84	7	4
Abitibi—Témiscamingue	12					
Saguenay—Lac-Saint-Jean	53	42		63	120	68
Québec	57	54	29	69	2	2
Manicouagan	11		17	20	8	8
Duplessis	4	38			3	
Sub-total	**1 412**	**594**	**309**	**539**	**194**	**86**
Present total		**2 315**				
Projected total					**819**	

Source : *Répertoire des voies cyclables*, 1996.

Note : This table does not take into account the mountain bike trails included in the above-mentioned guide.

Municipal policies

In Québec, as elsewhere, history has shown that the successful development of bikeway networks depends on rigorous planning. Although such an approach is still not the norm in the various municipalities, considerable progress has been made. In the 1970s, people rarely thought of integrating bikeway networks into global plans, be it for recreation, transportation, tourism or land use. With the steady rise in the number of cyclists, an increasing number of Québec municipalities have started to pay attention to their population's concerns and have willingly adopted plans for the development of bikeway networks. For example, based on a sample of 19 of the most densely populated municipalities in Québec (*Répertoire des municipalités du Québec*, 1995), we found that a large share (14 out of 19) have a bikeway development policy or master plan.

In their efforts to meet cyclists' needs, municipalities have also made major investments and participated to a greater extent in large-scale bikeway projects. The Estriade (21 km), whose development was financed mainly by four municipalities, the Montérégiade (23 km), the Soulanges Canal path (22 km) and the Grandes Fourches network in Estrie (53 km) are concrete examples of major municipal investments in this type of facility. However, Québec municipalities have not always made such large investments. Obviously, municipal contributions to this kind of project come from different sources: fund-raising campaigns organized by local or regional bodies, government employability programs, financial contributions from various funds (government or other) and so forth. The size of municipal investments varies depending on population, real estate wealth and the length of projected bikeways. It also varies according to the social and political context. We have noted that it is not always easy to determine how much money municipalities allocate to bikeway projects. Often, several municipal departments are asked to contribute manpower and funds, and in some cases, these contributions are combined with those for larger projects. Furthermore, labour costs are not always broken down, making it impossible to calculate the exact amount a municipality has contributed. To provide a rough idea of the size of municipal investments, the following table presents eight regional bikeway projects that have been carried out over the past decade or so, or are currently being implemented. They cover an area comprised by approximately 100 municipalities. An analysis of the contributions made by each municipality according to its population, real estate wealth and bikeway network length (km) did not allow us to establish a valid correlation between these factors or to define a model for evaluating the ability of municipalities to invest in bikeway projects. In all cases, specific regional characteristics and political will had a determining impact on the financial contribution made by each municipality.

Table 15

Municipal investments in nine regional bikeway projects

Project	Km	Region	Cost	Municipal investment	
Chambly Canal	21	Montérégie	$450 000	$150 000	33%
Soulanges Canal	21	Montérégie	$733 600	$145 000	20%
Grandes Fourches network	40	Estrie	$1 263 060	$842 000	67%
Estriade	21	Montérégie	$912 000	$800 000	80%
Montérégiade Farnham—Granby	23	Montérégie	$500 000	$285 000	57%
Montérégiade 2 Iberville—Farnham	17	Montérégie	$400 000	$49 200	12%
Bois-Francs linear park	77	Mauricie—Bois-Francs	$1 709 278	$1 108 811	65%
P'tit Train du Nord linear park	200	Laurentides	$6 100 000	$1 010 000	17%
Tour du Lac-Saint-Jean	241	Saguenay—Lac-Saint-Jean	$8 005 503	$1 706 667	21%

Source : *Étude sur le financement de la Route verte*, Vélo Québec, 1995.

Parking

The availability of safe parking facilities greatly promotes bicycle use, particularly in urban areas. In this respect, bicycles are no different from automobiles: their use is proportional to the supply of parking. According to 155 of the cyclists polled during the Décarie & Complices survey (1995), the fear of having a bicycle stolen is just as serious a constraint on bicycle use as the risk of having an accident.

A survey of parking authorities in the 19 municipalities polled for the purposes of the previous section ("Municipal policies") furnished the following information on municipal bicycle parking policies. Montréal and Trois-Rivières are the only two municipalities that provide parking spaces for bicycles on streets (i.e. on the roadway). However, six municipalities—namely, Montréal, Sherbrooke, Québec City, Verdun, Trois-Rivières and Victoriaville—provide bicycle parking on sidewalks. Eleven respondents said that, under their bicycle parking policy, facilities are set up in parks and around municipal buildings, while seven other municipalities were reported to supply parking even though they have no formal policy to that effect.

Montréal, Verdun and Saint-Bruno have by-laws requiring that bicycle parking spaces be laid out when new buildings are erected. In addition, Montréal, Verdun, Trois-Rivières and Victoriaville have by-laws that prohibit bicycle parking in certain locations, notably on street furniture. However, these municipalities are very tolerant in this regard, except in cases where illegally parked bicycles pose a threat to the safety of pedestrians. None of their by-laws provide for the removal of bicycles abandoned on street furniture. When complaints are lodged with the police, the bicycles are removed by police officers and auctioned off if they are still in satisfactory condition. Where no by-laws apply, bicycles are removed after a "reasonable" period of time.

Complementary nature of bicycling and public transit

Bicycling and public transit complement one another, be it for travelling within cities or between them. In urban areas, this means that suburbs whose population is too small to warrant regular public transit can still benefit from low-cost transportation services. In rural areas, the complementary nature of these two modes of transport allows bicycle tourists to travel longer distances, since they can use transportation modes other than a bicycle for part of their journey and thus reach destinations that might otherwise be inaccessible. Air transport is the only practical means of transport available to Europeans who wish to go bicycle touring in Québec.

Urban carriers

Combining bicycling and public transit makes it possible to travel longer distances or to reduce travel time, and even, in many cases, to do both. The complementary nature of these two modes of transport makes public transit more attractive. Although, to date, the public transit authorities that serve Québec's main population centres have taken very little advantage of this potential, the two largest offer certain services to cyclists, such as parking facilities and the possibility of putting bicycles on vehicles.

Bicycle parking and public transit

The Société de transport de la Communauté urbaine de Montréal (STCUM) has made 1 500 bicycle parking spaces available in its metro and commuter train stations as a whole in the Montréal area. The Société de transport de la rive sud de Montréal (STRSM) supplies bicycle parking near the bus terminal at the Longueuil metro station. In addition, in the summer of 1996, bicycle racks were installed in the park-and-ride facilities that had been set up along Highway 20 to encourage motorists to use public transit for the duration of work on the Louis-Hyppolite-Lafontaine Tunnel.

Buses

Several U.S. and Canadian cities, including Santa Cruz, Tampa, Seattle, Portland and Vancouver, have installed bike racks on their city buses. In Québec, equipment of this type was used by the STRSM between 1983 and the end of the 1980s. During a bicycle transportation promotion week in the spring of 1983, Vélo Québec and the Montréal-based group, Le Monde à bicyclette, provided the STRSM with bicycle racks based on a model used in Seattle. The racks were installed on buses that served Île Charron via the Louis-Hyppolite-Lafontaine Tunnel-Bridge, thus making the island accessible to cyclists. In 1996, none of the three main public transit authorities in the Montréal area—the STCUM, the STRSM or the Société des transports de Laval (STL)—offered bicycle transportation service.

Metro

Bicycles are allowed on the Montréal metro between 10:00 a.m. and 3:00 p.m. and after 7:00 p.m. on Monday to Friday, as well as throughout the day on weekends, except during special events. Exceptionally, bicycles were allowed on the Longueuil—Berri-UQAM line between 5:30 a.m. and 6:30 a.m. in the summer of 1996, during the work on the Louis-Hyppolite-Lafontaine Tunnel-Bridge. There is no extra charge for transporting bicycles on the metro. Cyclists must use the first coach of the train, and no more than four bicycles are allowed on at a time. Cyclists must be at least 16 years of age or be accompanied by an adult. The STCUM does not compile data on the number of bicycles it transports.

Commuter trains

The two commuter trains in the Montréal area (Montréal—Deux-Montagnes and Montréal—Rigaud) allow bicycles on board, but with numerous restrictions. From May 1 to October 30, cyclists may take bicycles on coaches identified by a pictogram of a bicycle.

During the morning rush hour, bicycles are not allowed on trains travelling from Deux-Montagnes to Montréal, while during the afternoon rush hour, they are prohibited on trains returning from Montréal to Deux-Montagnes. They are permitted, however, at all times on weekends. Cyclists can get on or off only at the following four stations: Bois-Francs, Roxboro—Pierrefonds, Sainte-Dorothée and Deux-Montagnes. Two bicycles may be transported in each coach. Bicycles are allowed on the Montréal—Rigaud train from Monday to Friday, except during peak hours, and throughout the day on weekends. Up to four bicycles are permitted per coach. Cyclists may board or disembark only at the following six stations: Windsor, Dorval, Beaconsfield, Sainte-Anne-de-Bellevue, Île-Perrot and Dorion. No data have been compiled on the number of bicycles transported.

Interurban carriers

Buses

In Québec, interurban buses always have a baggage compartment beneath the passenger section. This compartment is large enough to accommodate one or more bicycles, which are transported for an additional fee.

Orléans Express requires that bicycles be placed in a box or a bag, with the front wheel removed, the handlebars turned parallel to the bicycle and the pedals taken off. Transportation charges vary depending on the weight of the bicycle and the distance travelled. For example, a one-way trip between Montréal and Québec costs $13.56 for bicycles that weigh between 9 and 13 kg. The cost is double if cyclists do not accompany their bicycle. The same conditions are imposed by Autobus Auger M. inc. which charges $10.60 for a one-way trip between Montréal and Sherbrooke for bicycles that weigh between 9 and 13 kg. No statistics have been compiled by these companies on the number of bicycles they transport.

Trains

In Canada, Via Rail has a monopoly on passenger transportation by rail. Most of its trains are equipped with a baggage car and allow bicycles on board. Bicycles are not permitted, however, on express trains that serve large cities, such as the Montréal—Ottawa and Ottawa—Montréal trains, which do not have a baggage car. The cost of transporting a bicycle one way is $15.00 (box included). Bicycles must be brought to the station at least one hour before departure. It is preferable to ensure beforehand that a baggage car is available. Via Rail does not compile data on the number of bicycles it transports.

Ferries

In Québec, most rivers can be crossed by bridges, without making major detours. Similarly, since the coastline is fairly straight, there is no need to zigzag around large bays and inlets. The only areas where major ferry service is required are the Saguenay River and the Gulf of St. Lawrence. Most of the province's large ferries are operated by the Société des traversiers du Québec, which allows bicycles on all of its vessels. Cyclists pay the same fare as pedestrians, except on the Rivière-du-Loup—Saint-Siméon ferry, where an additional $3.35 is charged for bicycles. In most instances, passage is free, except when a bridge can be used instead of a ferry, as is the case between Québec City and Lévis. The Québec—Lévis and Sorel—Saint-Ignace ferries are equipped with bicycle racks. On vessels that do not have racks or that are full, cyclists must stay beside their bicycle or secure it with a lock. The number of bicycles transported on ferries has grown steadily since 1992.

Table 16

Transportation of bicycles on ferries

Ferry	Bicycles transported				
	1992	1993	1994	1995	1996
Québec—Lévis	41 097	42 901	47 980	49 770	60 515
Sorel—Saint-Ignace	6 969	10 095	10 099	11 941	14 031
Île-aux-Grues—Montmagny	2 476	1 724	2 013	3 224	3 417
Saint-Siméon—Rivière-du-Loup	—	—	313	371	520

Source : Société des traversiers du Québec, 1996.

Airlines

The major airlines transport bicycles on board their aircraft. However, conditions and rates vary widely. A survey of six companies that serve Québec provided the following information. Three of the six companies polled transport two pieces of luggage, one of which may be a bicycle, free of charge on intercontinental flights, but charge an additional $100 to $200 one way for excess baggage. Two other companies consider bicycles excess baggage at the outset and charge an extra $140 to $200 one way, depending on the destination. Only one airline transports bicycles for free.

All companies require that bicycles be packed in a plastic bag, usually supplied free of charge or sold at the check-in counter, or in a cardboard box. The packaging protects the bicycle and other baggage during transport. To facilitate handling, companies also require that bicycle pedals be taken off, that the handlebars be placed parallel to the frame and that the tires be deflated.

Airline companies do not record different categories of excess baggage separately. Therefore, data in this regard pertains not only to bicycles but also animals, oversized items, objects that require special handling and so forth. This explains why no more than two companies were able to provide even a very rough estimate of the number of bicycles they transport.

Table 17

Transportation of bicycles by airlines

Company	Basic fare (one way)	Excess baggage charge (one way)	Conditions	Packaging required	Number of bicycles transported
Air Canada	cont. : $50 intercont. : $140 to $200	N/A	pedals and handlebars		N/A
British Airways	intercont. : 2 pieces of luggage, free of charge	$140 to $150 per piece	tires and handlebars	bag (free)	N/A
KLM	intercont. : 2 piece of luggage, free of charge	$140 per piece	reservation required	box	approx. 150 to 200/year
Canadian	cont. : $25 to $35 intercont. : 2 pieces of luggage, free of charge	intercont. : $100 to $200 per piece	pedals, tires and handlebars	bag (free)	N/A
Air Transat	free	N/A	none	bag ($5)	approx. 700 to 800/year
Air France	intercont. : $140 or +	N/A	pedals, tires and handlebars	bag	N/A

Source : Vélo Québec, membre's information service, 1996.
Abbreviations : cont. = continental flights ; intercont. = intercontinental flights.

COMPARISON WITH FOREIGN COUNTRIES

It will be possible to measure future changes in bicycle use in Québec on the basis of the portrait of bicycling that we have prepared during the present study and by re-evaluating certain parameters within the next few years. For the time being, however, it is interesting to look for comparable features in foreign countries that enable us to put current practices into perspective. However, in studying data from Europe and the United States, we noted that the methods employed in these countries to measure bicycle use and changes in cycling levels are very different from the ones used here.

In the most bicycle friendly countries, such as the Netherlands, Denmark, Sweden and Germany, levels of bicycle use are usually determined by establishing the percentage of trips made by bicycle in comparison with those made by other modes of transport. This data is obtained through extensive, trip pattern surveys, which are equivalent to the origin-destination studies conducted by our public transit authorities. These surveys reveal the percentage of trips made by bicycle in various urban centres.

In the United States, data on the percentage of trips made by bicycle in comparison with those made by other modes of transport is rarely available for cities or states, despite a vast survey conducted on the occasion of the ISTEA *(Intermodal Surface Transportation Efficiency Act)* proceedings. Similarly, data can rarely be found with respect to the length of bikeways, which is not measured systematically at either the state or the national level. In addition, the concept of bikeway used in the United States is very different from that which prevails in Québec. Facilities considered to make it easier for cyclists to use the road network, such as wider right-hand lanes and paved shoulders, are often not called bikeways. Despite these differences, we were able to prepare the following tables and figures, which bear witness to the place bicycles occupy in other parts of the world.

Figure 5

Comparison of the length of bikeway networks in various urban centres (km)

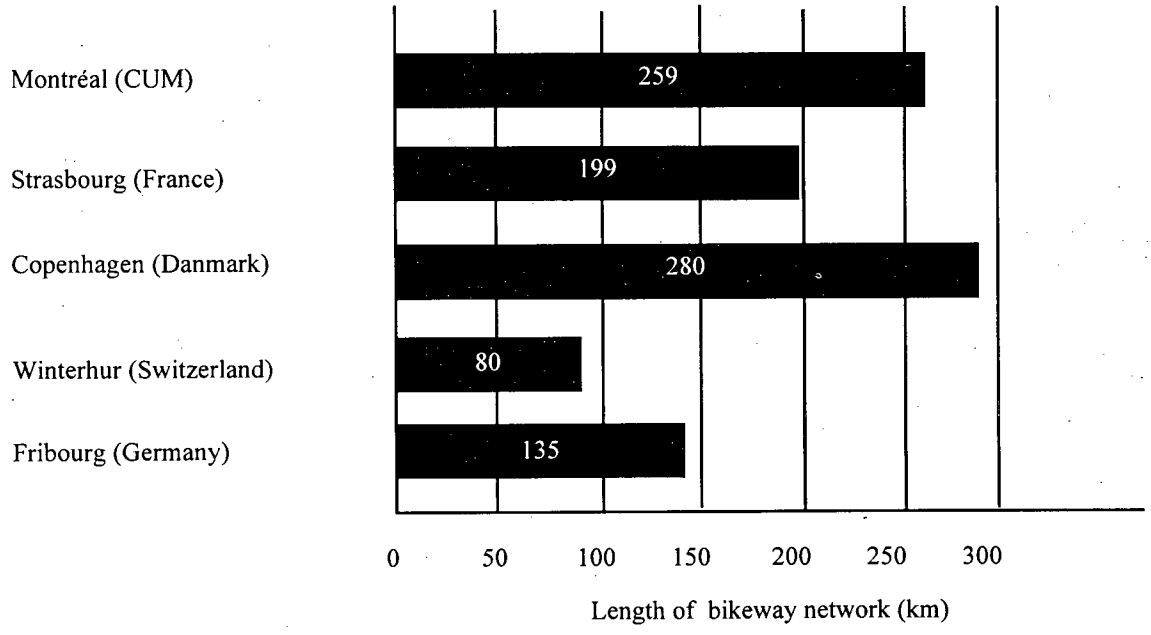
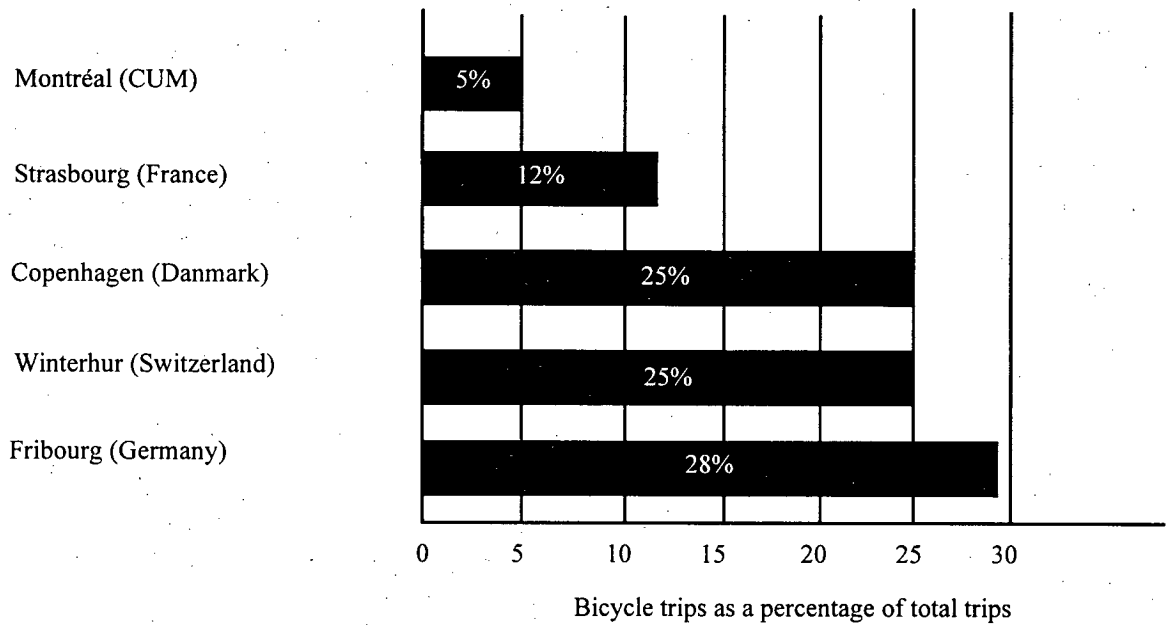


Figure 6

Percentage of trips made by bicycle in various urban centres



PERCEPTIONS, CONSTRAINTS AND INCENTIVES

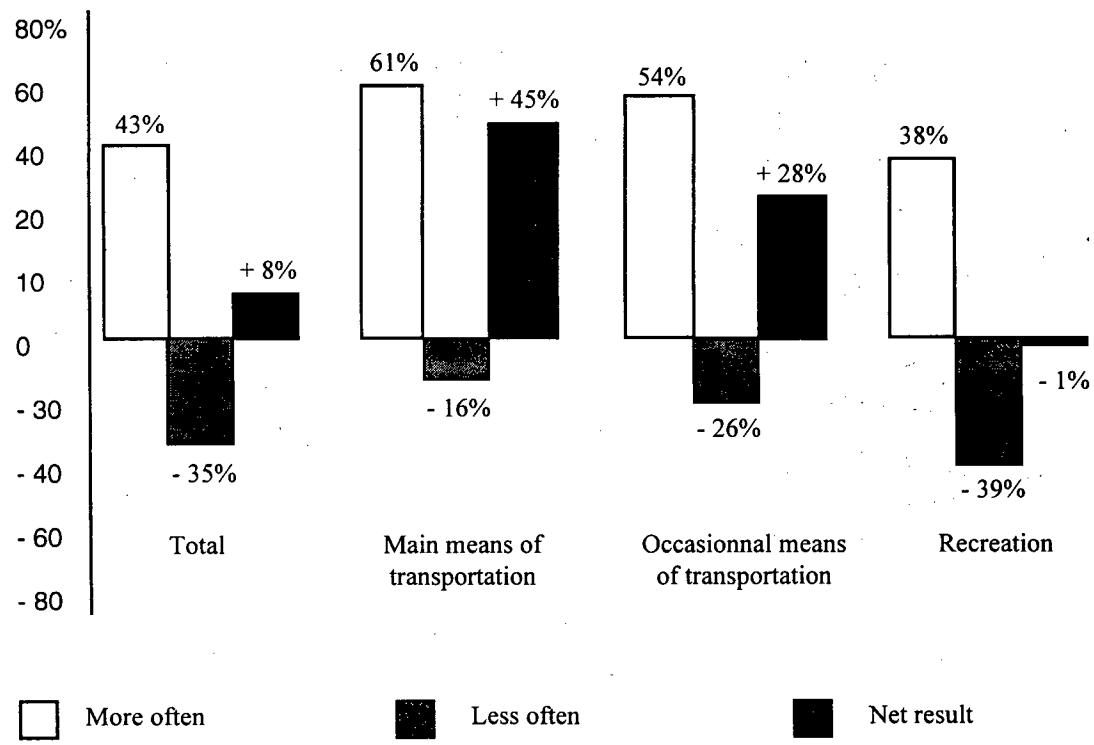
Although perceptions cannot be used as a basis for scientifically measuring changes in the popularity of bicycling, they can provide an idea of the context in which this activity evolves. The survey conducted during the present study allows us to describe this context.

Frequency of bicycling over the past five years

According to Quebecers, the frequency with which they bicycle has increased over the past five years. Forty-three percent of Québec cyclists estimate that they bicycle more often than they did five years ago, while 35% think they bicycle less. This represents a net increase of 8%. It can also be noted that the net development index is much higher among people who use bicycles as their main means of transport.

Figure 7

Changes in the frequency of bicycling over the past five years



In addition, cyclists claim that they travel longer distances than they did five years ago (net gain of 15%), a perception also noted during the participant surveys conducted by the organizers of the Tour de l'Île de Montréal. After taking part in the event, cyclists said that, in general, they bicycled more and travelled longer distances. Overall, the popularity of cycling has grown over the past five years, with the distance of trips increasing to a greater extent than the number of outings.

Incentives and constraints

Another question that might be asked is why people bicycle or, on the contrary, what makes them less inclined to engage in this activity. Once again, by measuring perceptions, we noted that, in general, most people ride simply for fun (97%) or to stay fit (96%). Other motivating factors include a desire to discover (79%), ecological convictions (71%) and economic considerations, a reason given by as many as 62% of cyclists.

Certain factors, however, limit bicycle use. The weather is definitely perceived as the main obstacle to cycling. Although distance is considered the second major obstacle, it is half as important as weather conditions. As for risk perception, cyclists admit that riding a bicycle entails certain hazards, but this does not constitute a major constraint and is no more important than the fear of having their bicycle stolen. It should be specified, however, that perceptions were measured only among people who bicycle. Therefore, the results do not allow us to determine why people do not bicycle.

Figure 8

Factors that limit bicycle use

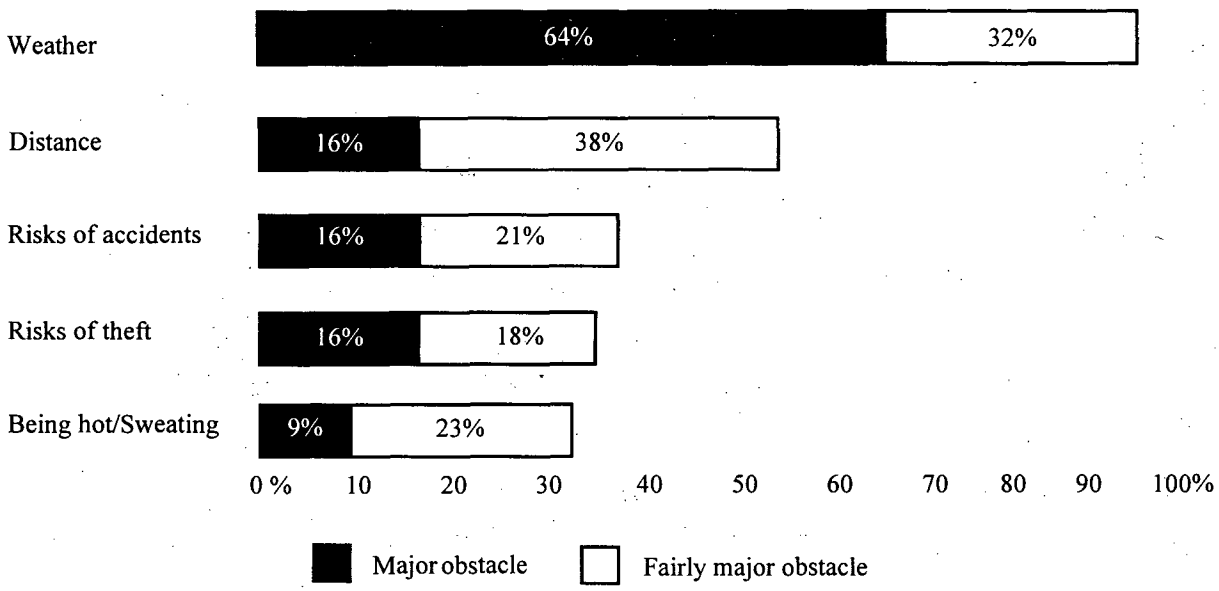


Table 18

Perception of the risk of injury in a bicycle accident

Risk	Of being injured	Of being seriously injured
Very high	31%	28%
Fairly high	45%	44%
Fairly low	22%	26%
Very low	2%	2%
Net result*	**+29**	**+26**

Thirty-three percent of cyclists consider the risk of theft as an obstacle to bicycle use. In 1994, 21 976 bicycle thefts were reported to police departments in Québec (including 20 839 bicycles worth less than $1 000). Around 5% of these crimes were solved. Forty-seven percent of the thefts occurred in Montréal and Montérégie. These figures probably represent only part of the problem, considering the high proportion of unreported thefts. Given that the deductible charged by most insurance companies is fairly high, i.e. around $200, and that the average price of a bicycle is in the order of that figure, it is often not very profitable to submit a claim.

Table 19

Bicycle thefts in Québec

	Number committed	Number solved
Bicycles	21 976	5.6%
Cars	26 260	13.6%

Source : Ministère de la Sécurité publique du Québec, 1996.

General perceptions

The part of our survey concerning general perceptions of bicycling has made it possible to determine the extent to which people support the idea of promoting bicycle use and under what circumstances. The opinions expressed are those of both cyclists and non-cyclists, i.e of all the respondents in the Décarie & Complices survey. Apparently, bicycling is associated with a series of factors that help to improve the environment and that meet the concerns of people who want to improve their quality of life. For example, nearly 90% of Quebecers believe that bicycle use helps to reduce automobile

of life. For example, nearly 90% of Quebecers believe that bicycle use helps to reduce automobile air pollution and that people should be encouraged to use bicycles as a mode of transport in urban centres. In addition, nearly two-thirds of Quebecers agree that increased bicycle use would help to reduce the volume of automobile traffic. With regard to bicycle facilities, all respondents, whether they bicycle or not, think that they are inadequate. (Appendix I, Volume II, p. 63)

CONCLUSION

The role of the bicycle has changed considerably in Québec over the past 30 years. After falling into disuse as the automobile gained popularity, this magnificent invention has finally won renewed acclaim. Although we still have a way to go to catch up to countries with ideal bicycling conditions, there is no doubt that cycling now plays an important role in Québec society. Despite the constraints imposed by our northern climate, it is still possible to bicycle in Québec seven to nine months a year, depending on the region.

This study has made it possible to express the importance of bicycling in Québec in quantitative terms and to define parameters that will allow us to measure changes in this activity before the turn of the century. In 1995, the Québec government took two steps that reflected its will to promote bicycle use: first, the ministère des Transports announced the *Bicycle Policy*, and second, the ambitious *Route verte* project was launched with a view to developing a bikeway across Québec.

The portrait of bicycling that we have presented here is based on a large amount of data and indicators. However, in addition to presenting the bare facts, we have also been able to make certain observations. Bicycling is fun and healthy, which is one of the main reasons why people engage in this activity. In the tourism sector, bicycle touring is definitely an increasingly popular product, as reflected by the growing number of multiple-day event rides and cycling packages. Motorists, who have long been the bane of cyclists, have in turn taken to bicycling, a situation that has certainly improved road network sharing. As for the behaviour of cyclists, it is far from perfect, but it must be admitted that things are improving. The popularity of certain regional linear parks and the enthusiastic response to the *Route verte* project, which will integrate certain bicycle facilities, clearly illustrates the benefits of bicycling.

We have also made several interesting discoveries with regard to the use of bicycles for transportation purposes. We are well aware, however, that the bicycle alone cannot save the planet. Nevertheless, its potential in this regard is enormous, insofar as we manage to integrate the bicycle into what is now called the "transportation mix." This promises to be a truly exciting challenge.

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