



Table 5. Behavior Change Strategies and Interventions to Promote Driver Safety

Behavior Change Strategies and Interventions				
	Strategy Name	Strategy Description	Applicable Driving Behavior(s)	References
<i>OVERALL (more than one driving behavior)</i>				
Effective Strategies	Physician requirements for reporting to DOT based on a medical condition of a driver	<ul style="list-style-type: none"> A highly confidential system of physician reporting for patients with ADHD, or other medical conditions, to DOT 	<ul style="list-style-type: none"> Aggressive Driving and Speeding Drowsy and Fatigued Driving 	(Jerome, Segal, & Habinski, 2006)
	Policy	<ul style="list-style-type: none"> Distracted driving laws that prohibit the use of cell phones or other devices while operating a vehicle Modify Graduated driver licensing (GDL) policies that include a distracted driving component Primary seat belt laws that require drivers to wear a seat belt BAC Laws Employer-based programs safety programs that require consistent seat belt use at all time 	<ul style="list-style-type: none"> Distracted Driving Impaired Driving - Alcohol Seat Belt Nonuse by Adults 	(Behzad, King, & Jacobson, 2014 ; Bhat, Beck, Bergen, & Kresnow, 2015 ; Boal, Li, & Rodriguez-Acosta, 2016 ; Hill, et al., 2017 ; Schroeder, Wilbur, & Peña, 2018 ; Strine, et al., 2010 ; The National Academies of Sciences, Engineering, Medicine, 2018)
	Visible enforcement of state or local policy	<ul style="list-style-type: none"> Sobriety checkpoints Ignition interlocks Roadside drug testing Incorporate substance related traffic-risk behaviors into early prevention/intervention strategies Fines and penalties for violations Interventions that address risk perception 	<ul style="list-style-type: none"> Aggressive driving and speeding Distracted driving Impaired Driving - Alcohol Impaired Driving - Other Drugs Seat Belt Nonuse by Adults 	(Arria, Caldeira, Vincent, Garnier-Dykstra, & O'Grady, 2011 ; Duarte, Escario, & Molina, 2016 ; Richard, et al., 2018 ; Sloan, McCutchan, & Eldred, 2017)



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<i>OVERALL (more than one driving behavior)</i>				
Effective Strategies	Theoretical frameworks that explore behavioral intention within and across one or more risky driving behaviors	<ul style="list-style-type: none"> • Theory of Reasoned Action • Theory of Planned Behavior • Theory of Normative Social Behavior 	<ul style="list-style-type: none"> • Aggressive Driving and Speeding • Distracted Driving • Drowsy and Fatigued Driving • Impaired Driving - Alcohol • Impaired Driving - Other Drugs • Seat Belt Nonuse by Adults 	(Atombo, Wu, Tettehfiio, & Agbo, 2017; Carter, Bingham, Zakrajsek, Shope, & Sayer, 2014; Elias, Bord, Baron-Epel, Gesser-Edelsburg, & Shifan, 2017; Fishbein & Ajzen, 2011; Gielen, Sleet, DiClemente, 2006; Jiang, Ling, Feng, Wang, & Shao, 2017; Okamura, Fujita, Kihira, Kosuge, & Mitsui, 2012; Nemme & White, 2010)
	Behavioral psychotherapies in addressing maladaptive and destructive behaviors	<ul style="list-style-type: none"> • The 'Big Five Personality Factors' is a model that can be mitigated to address behaviors as they relate to risky driving outcomes. These factors include the following personality traits: <ul style="list-style-type: none"> ○ Openness to experience, ○ Conscientiousness, ○ Extraversion-introversion, ○ Agreeableness, and ○ Neuroticism. 	<ul style="list-style-type: none"> • Aggressive Driving and Speeding • Drowsy and Fatigued Driving, • Impaired Driving - Alcohol • Impaired Driving - Other Drugs • Seat Belt Nonuse by Adults 	(Burtăverde, Chraif, Anîței, & Dumitru, 2017; Chraif, Anîței, Burtăverde, & Mihăilă, 2016; Iancu, Hogeia, & Olteanu, 2016; Parr, Ross, McManus, Wittig, & Stavrinou, 2016)



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<i>OVERALL (more than one driving behavior)</i>				
Promising Strategies	Driver education (except for programs that enable young/novice drivers to obtain their license at an earlier age because of enrollment in drivers education).	<ul style="list-style-type: none"> Educate drivers on scope of problem (e.g., drowsy and fatigued driving) Educate drivers on the dangers of unsafe driving practices (e.g., distracted driving, impaired driving) Education on the benefits of reducing risky driving behaviors Psychoeducational interventions Motivational approaches (e.g., motivational interviewing) 	<ul style="list-style-type: none"> Aggressive Driving or Speeding Distracted Driving Drowsy and Fatigued Driving Impaired Driving - Alcohol Driving, Impaired Driving - Other Drugs Seat Belt Nonuse by Adults 	(Bonar, et al., 2018; Engelberg, Hill, Rybar, & Styer, 2015; Hill, et al., 2017; Ortiz, Ortiz-Peregrina, Castro, Casares-López, & Salas, 2018; Owens, et al., 2018; Parr, Ross, McManus, Wittig, & Stavrinou, 2016; Strine, et al., 2010; Tefft, 2016; Tefft, 2014; Vanlaar, Simpson, Mayhew, & Roberston, 2008; Wickens, et al., 2012)
	Mindfulness training	<ul style="list-style-type: none"> Mindfulness training encourages emotion-regulation and involves acceptance of, but not reaction to, the current situation 	<ul style="list-style-type: none"> Aggressive Driving and Speeding Distracted Driving 	(Koppel, et al., 2019; Stephens, Koppel, Young, Chambers, & Hased, 2018)



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Promising Strategies	Comprehensive approaches to reduce risky driving	<ul style="list-style-type: none"> Multi-sector strategies that involve: <ul style="list-style-type: none"> Primary seat belt laws and enforcement Distracted driving laws Improved road design Improved emergency response Lower BAC limits set by state law Increased alcohol taxes Use of ignition interlocks Use of Driver Alcohol Detection System for Safety (DADSS) Interventions that address drug-impaired driving more assertively and simultaneously with alcohol-impaired driving 	<ul style="list-style-type: none"> Aggressive Driving and Speeding Distracted Driving Drowsy and Fatigued Driving Impaired Driving - Alcohol Impaired Driving - Other Drugs Seat Belt Nonuse by Adults 	(Arria, Caldeira, Vincent, Garnier-Dykstra, & O'Grady, 2011; Richard et. al., 2018; The National Academies of Sciences, Engineering, Medicine, 2018)
Emerging Strategies	Reward-based programs	<ul style="list-style-type: none"> Auto insurance rate discounts Reduced fees for license renewal 	<ul style="list-style-type: none"> Aggressive Driving and Speeding Distracted Driving Drowsy and Fatigued Driving Impaired Driving - Alcohol Impaired Driving - Other Drugs Seat Belt Nonuse by Adults 	(Constantinou, Panayiotou, Konstantinou, Loutsiou-Ladd, & Kapardis, 2011)



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<i>SPECIFIC (one identified driving behavior)</i>				
Effective Strategies	Campaigns targeted at changing group norms	<ul style="list-style-type: none"> • Social marketing campaigns designed to reset perceived social norms associated with distracted driving behavior • Campaigns that focus on parental involvement, parental modeling and monitoring of adolescent distracted driving behavior (e.g., The Checkpoints Program) 	Distracted Driving	(Carter, Bingham, Zakrajsek, Shope, & Sayer, 2014)
	Clinical observation and treatment of Obstructive Sleep Apnea (OSA)	<ul style="list-style-type: none"> • Expedite treatment of diagnosed OSA to minimize risk of motor vehicle-related injury due to drowsy and fatigued driving 	Drowsy and Fatigued Driving	(Tregear, Reston, Schoelles, & Phillips, 2009 ; U.S. Department of Transportation, 2008 ; Ward, et al., 2013)
	Healthcare Screening & Referral Programs (e.g., SBIRT Model)	<ul style="list-style-type: none"> • Include routine questions on drug-impaired driving (and riding) when screening for substance use problems • Law enforcement response that includes mandatory referral for evaluation and treatment of drug-impaired offenders • Revocation of driving privileges until treatment programs are complete • Community-based screening for substance use behaviors 	Impaired Driving - Other Drugs	(Arria, Caldeira, Vincent, Garnier-Dykstra, & O'Grady, 2011 ; Richard et. al., 2018 ; Substance Abuse and Mental Health Services Administration, 2019)



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<i>SPECIFIC (one identified driving behavior)</i>				
Promising Strategies	Gender-based education	<ul style="list-style-type: none"> Intervention strategies that are designed to increase awareness of the consequences of aggressive driving and speeding and promote safe driving practices Intervention strategies that address gender as one of many moderating factors in aggressive driving behaviors 	Aggressive Driving and Speeding	(Constantinou, Panayiotou, Konstantinou, Loutsiou-Ladd, & Kapardis, 2011 ; Kuhn, Drescher, Ruzek, & Rosen, 2010 ; Wickens, et al., 2012)
	Required annual recertification for commercial vehicle drivers with untreated obstructive sleep apnea (OSA)	<ul style="list-style-type: none"> A Medical Expert Panel convened by The U.S. Department of Transportation's (DOT), Federal Motor Carrier Safety Administration (FMCSA) made specific recommendations for updating guidelines and standards related to the medical fitness of commercial motor vehicle drivers with OSA 	Drowsy and Fatigued Driving	(Tregar, Reston, Schoelles, & Phillips, 2009 ; U.S. Department of Transportation, 2008)
	Maintain or increase price/fees related to the purchase or consumption of alcohol	<ul style="list-style-type: none"> Raise alcohol taxes to reduce impaired driving; suggest retail price restrictions and minimum alcohol pricing) 	Impaired Driving - Alcohol	(Richard et. al., 2018 ; The National Academies of Sciences, Engineering, Medicine, 2018)
	Address physical availability of alcohol products	<ul style="list-style-type: none"> Regulate alcohol outlet density, regulate hours and days of alcohol sales, and state monopolization of alcohol sales 	Impaired Driving - Alcohol	(Richard et. al., 2018 ; The National Academies of Sciences, Engineering, Medicine, 2018)



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Promising Strategies	Reduce illegal alcohol sales	<ul style="list-style-type: none"> Develop minimum legal drinking age laws/enforcement procedures, dram shop liability laws, create liability standards for social hosts (where alcohol is served), responsible beverage service/server training, sales to intoxicated persons, alcohol law enforcement) 	Impaired Driving - Alcohol	(Richard et. al., 2018 ; The National Academies of Sciences, Engineering, Medicine, 2018)
	Reduce the harmful effects of alcohol marketing	<ul style="list-style-type: none"> Decrease the number of advertisements or standardize advertisement times to avoid youth exposure to alcohol marketing. 	Impaired Driving - Alcohol	(Richard et. al., 2018 ; The National Academies of Sciences, Engineering, Medicine, 2018)
	Education/ awareness	<ul style="list-style-type: none"> School-based education programs, alcohol warning labels, and/or media campaigns. 	Impaired Driving - Alcohol	(Fairlie, Quinlan, Wood, Lawson, & Witt, 2010 ; Richard et. al., 2018 ; The National Academies of Sciences, Engineering, Medicine, 2018)
	Technological interventions	<ul style="list-style-type: none"> Personal devices and technology for estimating BAC and other BAC estimation tools. Combine alcohol monitoring with behavior change that take advantage of smartphone connectivity: <ul style="list-style-type: none"> Ongoing feedback support Real-time notifications of peers and loved ones Leverage social norms Contingency management Prompts to use ride sharing services Pair in-vehicle devices with smartphone applications that monitor driving 	Impaired Driving - Alcohol	(Richard et. al., 2018 ; The National Academies of Sciences, Engineering, Medicine, 2018 ; Sahabiswas, et al., 2016)



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Promising Strategies	Advocacy	<ul style="list-style-type: none"> Educate stakeholders, key partners, and policymakers on the connections between and value of screening, intervention, and treatment of substance abuse issues 	Impaired Driving - Other Drugs	(Arria, Caldeira, Vincent, Garnier-Dykstra, & O'Grady, 2011)
	Personal decision-making policies	<ul style="list-style-type: none"> Assess an individual's decision policy of wearing a seat belt while driving (full-time policy, part-time policy, or no policy at all) 	Seat Belt Nonuse by Adults	(Alattar, Yates, Eby, LeBlanc, & Molnar, 2016)
Emerging Strategies	Mobile phone technology solutions	<ul style="list-style-type: none"> Mobile applications that auto-respond to text messages when operating a vehicle Programs that text drivers text messages when they're texting and driving (e.g., "BTW, Friends would prefer a late TXT to an early death") 	Distracted Driving	(Parr, Ross, McManus, Wittig, & Stavrinos, 2016; Engelberg, Hill, Rybar, & Styer, 2015; Stavrinos, Pope, Shen, & Schwebel, 2018)



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Emerging Strategies	Car safety features	<ul style="list-style-type: none"> • Technology solutions based on the car make and model • Use of technology to detect or predict operator fatigue: <ul style="list-style-type: none"> ○ Drowsy driving warning systems ○ Driving simulators that detect drowsiness, temperature, time of day, lane width, average travel speed, driving time in heavy traffic and road types ○ Forward collision warning ○ Forward collision warning plus autobrake ○ Lane departure warning ○ Blind spot detection ○ Rear automatic braking ○ Rearview cameras ○ Rear cross-traffic alert 	<ul style="list-style-type: none"> • Drowsy and Fatigued Driving 	<p>(Abe, Mollicone, Basner, & Dinges, 2014; Balkin, Horrey, Graeber, Czeisler, & Dinges, 2011; Owens, et al., 2018; Sahabiswas, et al., 2016; Wang, Sun, Fang, Fu, & Stipancic, 2017)</p>
	New seat belt technology	<ul style="list-style-type: none"> • Make seat belts more comfortable and convenient to use for individuals who are obese. 	<ul style="list-style-type: none"> • Seat Belt Nonuse by Adults 	<p>(Jehle, Doshi, Karagianis, Consiglio, & Jehle, 2014)</p>