# Appendices

THIS PAGE INTENTIONALLY LEFT BLANK

# Appendix A: Acronyms

*Target Zero contains many acronyms for agencies, organizations, special programs, and other elements of traffic safety. One purpose of Target Zero is to create a common language for traffic safety practitioners in Washington State. This acronym list will help practitioners easily familiarize themselves with the acronyms used by the diverse groups — educators, engineers, law enforcement officers, academics, and many others — who are attempting to reduce traffic fatalities and serious injuries in our state.*

| | |
|---|---|
| AAA | American Automobile Association |
| AADT | Average Annual Daily Traffic |
| AAMVA | American Association of Motor Vehicle Administrators |
| AAP | American Academy of Pediatrics |
| ABACCL | American Bar Association Center on Children and the Law |
| ADA | Americans with Disabilities Act |
| AIAN | American Indian and Alaskan Native |
| AOC | Washington Administrative Office of the Courts |
| ARIDE | Advanced Roadside Impaired Driving Enforcement |
| ASE | Automated Speed Inforcement |
| AV | Automated Vehicle |
| BAC | Blood Alcohol Content |
| BIA | Bureau of Indian Affairs |
| CAT | Cooperative Automated Transportation |
| CDC | Centers for Disease Control and Prevention |
| CDL | Commercial Driver License |
| CFR | Code of Federal Regulations |
| CHSC | Center for Health and Safety |
| CLAS | Collision Location and Analysis System |
| CMF | Crash Modification Factor |
| CMV | Commercial Motor Vehicle |
| CPS | Child Passenger Safety |
| CPST | Child Passenger Safety Technician |
| CRAB | County Road Administration Board |
| CTW | Countermeasures That Work |
| CVD | Commercial Vehicle Division |
| CVEB | Commercial Vehicle Enforcement Bureau |
| DAG | Data Analyst Group |
| DDACTS | Data-Driven Approaches to Crime and Traffic Safety |
| DEI | Diversity, Equity, and Inclusion |
| DOH | Washington State Department of Health |
| DOL | Washington State Department of Licensing |
| DOT | Department of Transportation |
| DRE | Drug Recognition Expert |
| DUI | Driving Under the Influence |
| DUID | Driving Under the Influence of Drugs |
| DUICA | Driving Under the Influence of Cannabis and Alcohol |
| E-DUI | Driving Under the Influence of Electronics |
| EMS | Emergency Medical Services |
| eTRIP | Electronic Ticketing and Collision Reporting Program |
| FARS | Fatality Analysis Reporting System |

| | |
|---|---|
| FAST Act | Fixing America's Surface Transportation Act |
| FMCSA | Federal Motor Carrier Safety Administration |
| FHWA | Federal Highway Administration |
| GDL | Graduated Drivers License |
| GHSA | Governors Highway Safety Association |
| GIS | Geographic Information System |
| GSA | United States General Services Administration |
| GVWR | Gross vehicle weight rating |
| HBD | Had Been Drinking |
| HCA | Health Care Authority |
| HFST | High Friction Surface Treatment |
| HIA | Health Impact Assessment |
| HLDI | Highway Loss Data Institute |
| HPMS | Highway Performance Monitoring System |
| HRRR | High Risk Rural Roads |
| HSIP | Highway Safety Improvement Program |
| HSP | Highway Safety Plan |
| HSM | Highway Safety Manual |
| HVE | High Visibility Enforcement |
| IBL | Information by Location |
| IID | Ignition Interlock Device |
| IIHS | Insurance Institute for Highway Safety |
| IIL | Ignition Interlock License |
| LCB | Liquor and Cannabis Board |
| LE | Law Enforcement |
| LEP | Limited English Proficiency |
| LIDAR | Light Detection and Ranging |
| LIT | Literature; refers to a strategy supported by extensive literature but lacks a metastudy |
| LRS | Linear Referencing System |
| LRSP | Local Road Safety Plan |
| MAP-21 | Moving Ahead for Progress in the 21st Century Act |
| META | Metastudy; refers to a strategy supported with published, favorable outcomes in the form of a metastudy (a review of several related studies for methodological strength and consistent outcomes) |
| MIDU | Mobile Impaired Driving Unit |
| MLDA | Minimum Legal Drinking Age |
| MIT | Muckleshoot Indian Tribe |
| MMUCC | Model Minimum Uniform Crash Criteria |
| MPO | Metropolitan Planning Organization |
| MUTCD | Manual on Uniform Traffic Control Devices |
| NATEO | The Northwest Association of Tribal Law Enforcement Officers |
| NCHRP | National Cooperative Highway Research Program |
| NGA | National Governors Association |
| NHS | National Highway System |
| NHTSA | National Highway Traffic Safety Administration |
| NTSB | National Transportation Safety Board |
| OCIO | Washington State Office of the Chief Information Officer |
| OECD | Organisation for Economic Co-operation and Development |
| OFM | Office of Financial Management |
| OIC | Office of the Insurance Commissioner |
| OSPI | Office of Superintendent of Public Instruction |
| PBT | Preliminary Breath Test |

| | |
|---|---|
| PSA | Public Service Announcement |
| PSAC | Pedestrian Safety Advisory Council |
| PTCR | Police Traffic Collision Report |
| RCW | Revised Code of Washington |
| RIA | Resource Inventory Analysis |
| ROW | Right of Way |
| RSA | Road Safety Audit |
| RTPO | Regional Transportation Planning Organization |
| SAE | Society of Automotive Engineers |
| SDOT | Seattle Department of Transportation |
| SFST | Standard Field Sobriety Tests |
| SHSP | Strategic Highway Safety Plan |
| STEP | Safe Transportation for Every Pedestrian |
| SURTCOM | Small Urban and Rural Transit Center on Mobility |
| TACT | Ticket Aggressive Cars and Trucks |
| THC | Tetrahydrocannabinol |
| TIB | Transportation Improvement Board |
| TLD | Toxicology Laboratory Division |
| TRC | Traffic Records Committee |
| TRS | Traffic Records Systems |
| TREDS | Training, Research, and Education for Driving Safety |
| TSRP | Traffic Safety Resource Prosecutors |
| TTPO | Tribal Transportation Planning Organization |
| TTSAB | Tribal Traffic Safety Advisory Board |
| TZD | Toward Zero Deaths |
| TZM | Target Zero Manager |
| UA | Urinalysis |
| USDOT | United States Department of Transportation |
| UTC | Utilities and Transportation Commission |
| VIN | Vehicle Identification Number |
| VMT | Vehicle Miles Traveled |
| WASPC | Washington Association of Sheriffs & Police Chiefs |
| WaTech | Washington Technology Solutions |
| WEMSIS | Washington EMS Information System |
| WIDAC | Washington Impaired Driving Advisory Council |
| WITPAC | The Washington Indian Transportation Policy Advisory Committee |
| WSDOT | Washington State Department of Transportation |
| WSP | Washington State Patrol |
| WSTC | Washington State Transportation Commission |
| WTN | Washington Tracking Network |
| WTR | Washington Trauma Registry |
| WTSC | Washington Traffic Safety Commission |

THIS PAGE INTENTIONALLY LEFT BLANK

# Appendix B: Glossary

*Target Zero contains many specialized terms related to traffic safety in Washington State. One purpose of Target Zero is to create a common language for traffic safety practitioners in Washington State. This glossary is intended to help explain the meanings of specific terms used by the diverse groups—educators, engineers, law enforcement officers, academics, and many others—who are attempting to reduce traffic fatalities and serious injuries in our state.*

**Alcohol-Impaired Driver**

Any driver with a BAC of .08 or higher.

**Blood Alcohol Concentration**

BAC is measured as a percentage by weight of alcohol in the blood (grams/deciliter). A positive BAC level (0 .01 g/dl and higher) indicates that alcohol was consumed by the person tested. A BAC level of 0.08 g/dl or more indicates that the person was intoxicated.

**Contributing Circumstance**

An element or driving action that, in the reporting officer's opinion, best describes the main cause of the crash. First, second, and third contributing causes are collected for each motor vehicle driver, bicyclist, and pedestrian involved in the crash.

**Cooperative Automated Transportation**

Cooperative Automated Transportation includes both autonomous and connected vehicles. Vehicles with connectivity are able to communicate automatically with other vehicles and infrastructure, and also identify pedestrians and bicyclists in and around roadways. Automated vehicles, also called autonomous or self-driving, do not require a driver to operate the vehicle or monitor roadway conditions.

**Crash**

An unintended event that causes a death, injury, or property damage, and involves at least one motor vehicle or bicyclist on a public roadway.

**Death Certificate Records**

The Department of Health manages all of Washington's vital statistics, including death events. Death certificates include information about the primary and underlying causes of death as determined by medical examiners and coroners. This information is used to reconcile deaths involving traffic crashes to determine if the death was traffic-related (death as a result of injuries sustained in a crash) or non-traffic-related (death occurs and then the crash occurs, such as a heart attack while driving).

**Distracted Driver**

Distracted driving is any activity that takes a driver's attention away from the task of driving. It includes any driver with the following attributes as recorded by the investigating officer: looked but did not see; distracted by vehicle occupant or object; while using a cell phone (talking, listening, dialing, etc.); adjusting vehicle controls; distracted by object/person outside the vehicle; eating, drinking, or smoking; emotional or lost in thought; other or unknown distraction.

**Driving under the influence (DUI) (legal definition)**

In Washington State, a person is guilty of driving while under the influence of intoxicating liquor, cannabis, or any drug if the person drives a vehicle within this state and:

- Has, within two hours after driving, an alcohol concentration of .08 or higher as shown by analysis of the person's breath or blood made under RCW 46.61.506; or
- Has, within two hours after driving, a THC concentration of 5.00 or higher as shown by analysis of the person's blood made under RCW 46.61.506; or
- Is under the influence of or affected by intoxicating liquor, cannabis, or any drug; or
- Is under the combined influence of or affected by intoxicating liquor, cannabis, and any drug.

**Electronic Traffic Information Processing (eTRIP) Initiative**

A collaborative effort among state and local agencies to create a seamless and integrated system through which traffic-related information can travel from its point of origin to its end use and analysis. The intent of this undertaking is to move from the current paper-based process to an automated system that will enable law enforcement agencies to electronically create tickets and crash reports in the field and transmit this data to state repositories and authorized users.

**Fatality**

A person who died within 30 days of a crash as a result of injuries sustained in the crash.

**Fatality Analysis Reporting System (FARS)**

A database system containing data on a census of fatal traffic crashes within the 50 states, the District of Columbia, and Puerto Rico. To be included in FARS, a crash must involve a motor vehicle traveling on a trafficway customarily open to the public and result in the death of a person (occupant of a vehicle or a non-occupant) within 30 days of the crash. FARS collects information on over 100 different coded data elements that characterize the crash, the vehicle, and the people involved.

**Fatality Rate**

Number of deaths resulting from reportable crash for a specified segment of public roadway per 100 million vehicle miles of travel or per 100,000 people.

**Heavy Truck**

1. Any vehicle with a trailer classified at gross vehicle weight rating (GVWR) of 10,001 lbs. or more, a single vehicle with GVWR of 26,001 lbs. or more, or a single vehicle of 26,000 lbs. or less that is commercial driver license (CDL)-required, or a commercial vehicle supplement to the crash report.
2. A vehicle type of truck and trailer, truck tractor, truck tractor and semi-trailer, or truck-double trailer combinations.
3. A vehicle usage classification of concrete mixer, dump truck, logging truck, refuse/recycle truck, van over 10,001 lbs., tanker truck, or auto carrier.

**Impaired Driver**

Any driver with a BAC of .08 or greater and/or any driver with a positive result on a drug test or through an investigating officer or drug recognition expert (DRE) assessment of impairment.

**Impairment Involved**

A fatal or serious injury crash involving a driver, pedestrian, bicyclist, etc., with a BAC of .08 or greater and/or a positive result on a drug test.

**Licensed Driver**

A person who is licensed by any state, province, or other governmental entity to operate a motor vehicle on public roadways.

**Motor Vehicle**

Any motorized device in, upon, or by which any person or property is or may be transported or drawn upon a public roadway, excepting devices used exclusively upon stationary rails or tracks. This includes every motorized vehicle that is self-propelled or propelled by electric power (excluding motorized wheelchairs), including that obtained from overhead trolley wires but not operated on rails.

**Non-motorist**

Any person who is not an occupant of a motor vehicle in transport; includes the following:

4. Pedestrians
5. Bicyclists, tricyclists, and unicyclists
6. Occupants of parked motor vehicles
7. Others such as people riding on animals and persons riding in animal-drawn conveyances

**Older Driver Involved**

A fatal or serious injury crash involving a driver age 70 or older. Involvement does not indicate fault.

**Passenger**

Any occupant of a motor vehicle who is not a driver.

**Pedestrian**

Any person not in or upon a motor vehicle or other vehicle but includes persons on personal conveyance devices, such as foot scooters, skateboards, in-line skates, etc. Pedestrians also include people using any type of mobility assistive device such as a wheelchair, walker, or scooter.

**Per se Alcohol Limit**

No further proof is needed. When a person is found to have, within two hours after driving, an alcohol concentration of .08 or higher or a THC concentration of 5.00 nanograms per milliliter of blood or higher, that person is guilty “per se” of driving under the influence.

**Polydrug Use**

Using multiple drugs, including cannabis, illicit substances, over-the-counter drugs, and/or prescription medications. This can cause interactions that create greater impairment than one drug on its own.

**Restraint**

A device such as a seat belt, shoulder belt, booster seat, or car seat used to hold the occupant of a motor vehicle in the seat at all times while the vehicle is in motion.

**Rural**

Any area, incorporated and unincorporated, with a population of less than 5,000.

**Serious Injury**

Any injury other than a fatal injury that prevents the injured person from walking, driving, or normally continuing the activities the person was capable of performing before the injury occurred. This definition applies to traffic crash data only. This is not the legal definition or medical definition of serious injury.

**Speeding**

Speeding occurs when drivers travel above the posted speed limit or too fast for conditions. Drivers may be traveling well under the posted speed limit, but may be considered speeding when road, traffic, or weather conditions such as such as icy roads, poor visibility, or fog may cause drivers to lose control of their vehicles or increase normal stopping distance.

**Traffic Safety Culture**

The shared belief system of a group of people that influences road use behavior and stakeholder actions that impact traffic safety.

**Transcreation**

The process of adapting a message from one language to another, while maintaining its intent, style, tone, and context. The aim of a transcreated message is to successfully evoke the same emotions and contextual relevance in the new language as the original or source language. This includes words, graphics, video, audio, and cultural nuances.

**Trauma Injury**

A major single or major multiple injury requiring immediate medical or surgical intervention or treatment to prevent death or permanent disability.

**Urban**

Any incorporated area with a population of over 5,000.

**Vehicle Miles Traveled (VMT)**

The number of miles traveled annually by motor vehicles.

**Work Zone**

Any activity involving construction, maintenance, or utility work on or in the immediate vicinity of a public roadway. A work zone may be active (workers present) or inactive.

**Young Driver Involved**

A fatal or serious injury crash involving a driver age 16–25. Involvement does not indicate fault.

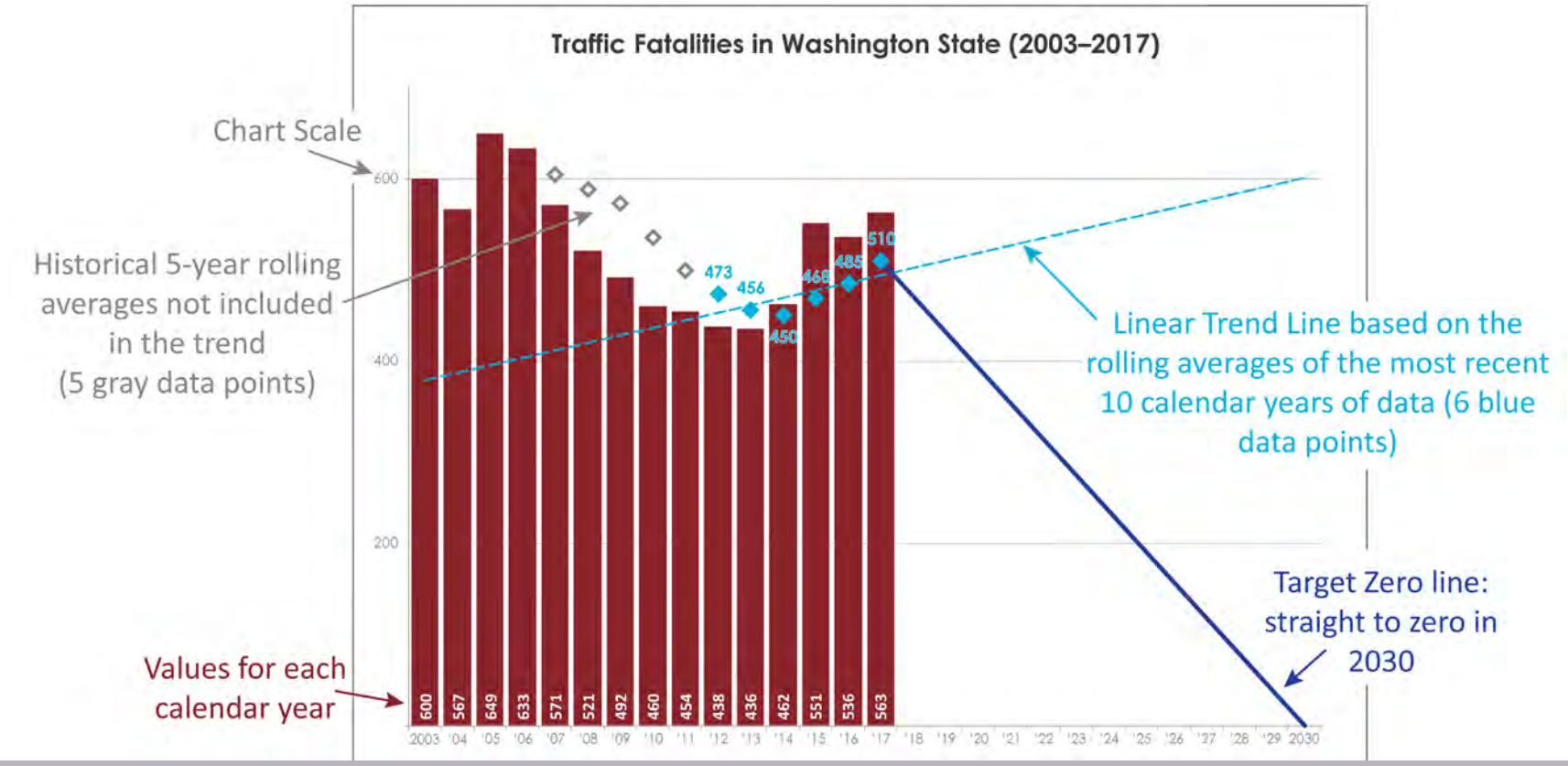
# Appendix C: Methodologies

This appendix explains the methodology used in developing the Target Zero fatality and serious injury charts and maps. For information on the sources of data, please see Appendix D, Data Sources and Appendix E, Data Definitions.

## Five-year Rolling Averages and the Performance Trend Line

In 2000, Washington State formed its Target Zero vision: zero deaths and serious injuries by 2030. This edition of Target Zero provides the most recent 10 years of traffic fatality and serious injury data for our state, 2008–2017. The vision of zero by 2030 itself is a linear concept: a direct relationship between the two variables of fatalities and time (or, of serious injuries and time) converging at zero in 2030. Therefore, it makes sense to use a linear measure of progress to compare with a linear goal. The linear performance trend line may indicate a declining, flat, or increasing trend, depending on the change among the series of five-year rolling averages.

Each five-year rolling average contributes equally to the change driving the direction of the trend. The rolling averages smooth the effect of a single year's fluctuation on a linear trend. The most recent 10 years



of data are used to derive six five-year rolling averages on which the performance trend is based: data for 2008–2017 result in rolling averages of 2008–2012, 2009–2013, 2010–2014, 2011–2015, 2012–2016, and 2013–2017. An additional five years of historic data and the historic five-year rolling averages are also shown but not included in the trend line.

The performance trend line represents a future projection assuming all variation, fluctuation, and preventive measures stay at historic and current levels. In practice, by continuously implementing new strategies and enhancing and maintaining existing strategies, we can drive the trend downward, closer to the overall goal of zero by 2030.

## The Target Zero Goal Line

For this edition of Target Zero, the Data Analysts Group projected fatality and serious injury trends out to the year 2030. This approach allows us to measure incremental progress within the entire 2030 time-frame and see what's required to reach zero by 2030. The Target Zero goal line is simply a straight line to zero in 2030, starting from the middle of the most recent five-year average (2013–2017). From the Target Zero line, we can estimate the annual fatality and serious injury reductions that must occur to reach zero in 2030.

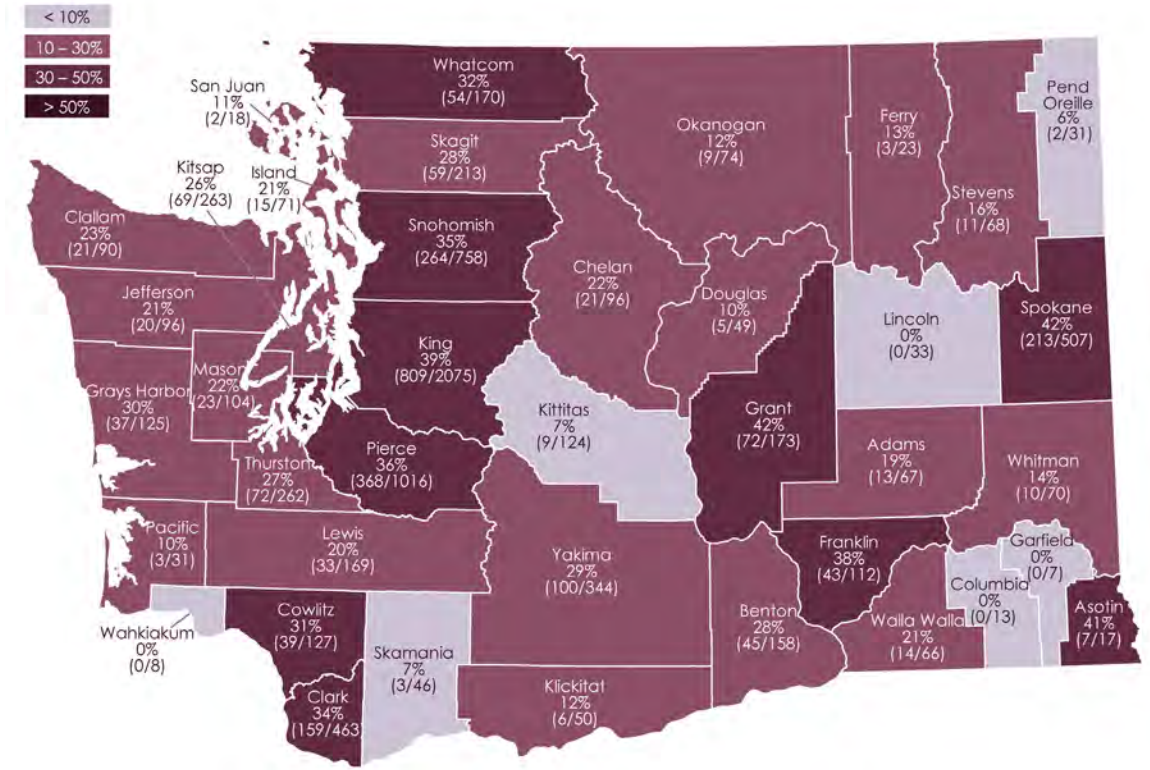
## The Performance Gap

The solid line on trend charts represents the Target Zero line—the downward trend needed to reach zero by 2030. The performance gap is the space between the Target Zero goal line and the performance trend line projected from the five-year rolling averages.

The performance gap may also be used as a monitoring tool. For example, if the performance gap is smaller in 2018 and grows on its way to 2030, it indicates we need not only a greater decrease in overall counts, but also a greater average annual decline than we have had. This type of gap represents areas in need of new and expanded strategies. However, if the gap is of similar width in 2018 as it is in 2030, then we have achieved the necessary average annual decline, but need an immediate downward drive in annual counts to close the gap.

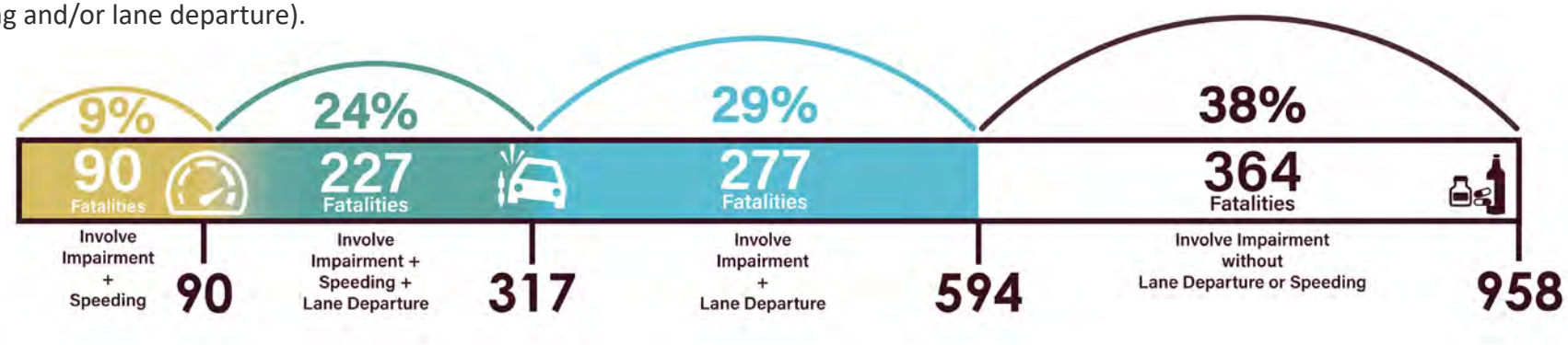
## Emphasis Area County Maps

Each emphasis area chapter includes a map that shows the percent of each county's fatalities and serious injuries that involve a specific emphasis area, such as impairment. The maps are color coded to identify counties with higher proportions of fatalities and serious injuries around a specific emphasis area. This also helps individual counties to identify their traffic safety priorities and see how they compare to other counties.



## Top Two Factors Overlap Graphics

Each emphasis area chapter includes a factor overlap graph. For each emphasis area, the top two additional overlapping fatal crash emphasis areas from the priority table were identified and the overlap displayed. For example, of all impairment involved fatalities, 62% also involved lane departure and/or speeding (9% involved speeding, 29% involved lane departure, and 24% involved BOTH speeding and lane departure; combined this means that 62% of impairment fatalities also involved speeding and/or lane departure).




## Fatality and Serious Injury Rates

We reference rates in some chapters of this Target Zero edition. There are three types of rates in our analysis:

**1. Rates based on vehicle miles traveled (VMT)**

The most common rates used in traffic safety statistics are the number of fatalities or serious injuries per 100 million VMT. These rates represent the measure of risk for traffic deaths or serious injuries based on estimated annual traffic volume. VMT is available for state, county, rural, and urban classifications.

**2. Rates based on population**

Rates of fatalities and serious injuries specific to population subgroups, such as racial/ethnic and age-specific groups, are calculated per 100,000 people. Comparisons of these population rates enable identification of high risk groups. Such groups may be at higher risk for traffic death or serious injury than other population subgroups, as is the case with the Native American population.

**3. Rates based on licensed or endorsed drivers**

Some rates are presented based on the number of licensed or endorsed drivers. These rates are similar to population rates, but represent a measure of risk of traffic death or serious injury based on the estimated number of drivers. The rates are useful when comparing different categories of drivers, such as motorcyclists.

As we get closer to zero fatalities and serious injuries, it gets harder to affect the trends. Target Zero Partners recognize that there are factors related to traffic deaths and serious injuries outside the reach of listed strategies. Additionally, we recognize most strategies have immediate benefits that level off over time. As we look to the future, we also realize that as overall fatal and serious injury counts are driven downward, it will be harder to meet average annual reduction goals.

These recognitions are particularly true related to affecting fatality and serious injury trends among the more isolated, higher risk, and/or less receptive members of Washington's population.

As linear trends flatten and we get closer to 2030, we will need more sophisticated statistical methods to monitor and predict outcomes. Our challenge is to continue to accurately identify and monitor changing trends, and keep ahead of them with new and expanded strategies. This challenge is addressed in the Evaluation, Analysis, and Diagnosis chapter on page 176.

The factors contributing to traffic fatalities and serious injuries are an intimate web of environmental, behavioral, and vehicular factors. Some factors are related to the triggering of the event, while others are related to the severity of the event. Using various facets of Enforcement, Education, Engineering, Emergency Medical Services, and Evaluation, we will continue to prevent these crashes from happening in the first place, and to mitigate the harm incurred when they do happen.

While we may not be able to prevent all crashes, we can eliminate those that result in deaths and serious injuries, our vision for Washington State.

# Appendix D: Target Zero Data Sources

To develop the data that drive Target Zero, practitioners draw data from multiple sources in Washington State. This appendix describes those sources.

## The Fatality Analysis Reporting System

The Fatality Analysis Reporting System (FARS) is the source of Target Zero's fatality data. The Washington Traffic Safety Commission (WTSC) contracts with the National Highway Traffic Safety Administration (NHTSA) to provide FARS data for Washington State. FARS is a nationwide census of traffic fatalities that characterizes the crash, the vehicles, and the people involved in each reported fatal crash. FARS contains more than 140 coded data elements that are collected from official documents, including Police Traffic Collision Reports (PTCR), state driver licensing and vehicle registration files, death certificates, toxicology reports, and emergency medical services (EMS) reports.

To be included in FARS, a crash must involve a motor vehicle traveling on a trafficway that is customarily open to the public, and result in the death of a person (either an occupant of a vehicle or a pedestrian/bicyclist) within 30 days of the crash.

## The Collision Location and Analysis System

The Collision Location and Analysis System (CLAS), a crash data repository, is the source of Target Zero's serious injury data. CLAS is housed at the Washington State Department of Transportation (WSDOT). Most of the data in CLAS comes from law enforcement officers via the PTCR. Citizens may also submit non-police assisted reports of crash events via the Citizen Vehicle Collision Report.

CLAS stores all reportable traffic crash data for Washington State public roadways. A crash needs to meet at least one of the two following criteria to be considered reportable: 1) a minimum property damage threshold of $1,000, and/or 2) bodily injury occurred as a result of the crash.

Target Zero uses CLAS crash data for counts of seriously injured people. However, there are sections within Target Zero that also use CLAS crash information for deriving counts of fatally injured people through record merging with FARS. Those sections are Lane Departure and Intersection. CLAS crash data were also used to reconcile jurisdictional assignment in FARS for road type/jurisdiction analysis.

It is widely acknowledged that serious injury classifications assigned by investigating officers are not as accurate as injury severity derived from health records. The serious injury data presented in this edition of Target Zero is classified by the investigating officer at the scene. However, Washington's Traffic Records Committee is making progress on a collaborative, multi-agency effort to get more accurate injury severity data, particularly for serious injury crashes. For more information about the efforts of the Traffic Records Committee (TRC), see page 168.

## Vehicle Miles Traveled Estimates

Vehicle Miles Traveled (VMT) is a measure of the total number of miles traveled by all vehicles over a segment of road over a specific period of time, usually either a day or a year. WSDOT collects and reports several different types of road and street data to the federal Highway Performance Monitoring System (HPMS) each year. WSDOT collects traffic data for state highways and relies on local jurisdictions to provide traffic data for their roads and streets.

VMT is calculated as follows:

VMT = (length of road segment) x (the Average Annual Daily Traffic [AADT] traveling on that road segment)

The total VMT for a highway network or region is a summation of VMT for all segments of roads that make up the network or region. Statewide VMT is a summation of all segments of road statewide.

## Department of Licensing Driver Record Data

The Washington State Department of Licensing (DOL) provides the driver record data used in Target Zero from their Drivers Data Mart database. This data is updated daily from several sources, and contains the complete driver records for all Washington drivers.

## Administrative Office of the Courts Citation Data

Washington Administrative Office of the Courts (AOC) provides court and citation data, which includes enforcement and court processing. For example, AOC collects the number of texting while driving citations when they are filed with the court.

Data gaps exist, which Target Zero Partners address, such as tracking a single DUI case through the myriad of internal and external data systems that the information passes through. The AOC actively participates in the Traffic Records Committee and is working to identify and find solutions for these data gaps, and to develop methods for linking AOC data with WTSC and WSDOT crash data.

## Office of Financial Management Population Estimates

Washington's Office of Financial Management (OFM) has been providing annual population estimates for revenue allocation purposes since the 1940s. OFM provides population estimates, including breakouts by county, age, gender, and race/ethnicity, on their population page.

# Appendix E: Data Definitions

| Measures | Fatality Definition<br>**From FARS database** | Serious Injury Definition<br>**From CLAS database** |
|---|---|---|
| High Risk Behavior | Fatality resulting from a collision that involved… | Serious injury resulting from a collision that involved… |
| Impairment Involved | Any driver, pedestrian, or bicyclist with a Blood Alcohol Concentration (BAC) of 0.08 or higher or a positive drug result as confirmed by the state Toxicology Laboratory. | Any driver, pedestrian, or bicyclist in which the investigating officer indicated that the person was impaired by drugs or alcohol and reported in contributing circumstances as 'Under the Influence of Alcohol', 'Under the Influence of Drugs', or 'Had Taken Medication' or sobriety reported as 'HBD – Ability Impaired' or 'HBD – Ability Impaired (tox test)'. |
| Distraction Involved | Any driver with the following driver-related factors (2009 and earlier): emotional; inattentive/ careless; cellular telephone; fax machine; cellular telephone in use in vehicle; computer; computer fax machines/printers; on-board navigation system; two-way radio; or head-up display. Any driver with the following driver distractions (2010 and later): looked but did not see; by other occupants; by moving object in vehicle; while talking or listening to cellular phone; while dialing cellular phone; adjusting audio or climate controls; while using other device integral to vehicle; while using or reaching for device brought into vehicle; distracted by outside person, object, or event; eating or drinking; smoking related; other cellular phone related; distraction/ inattention; distraction/careless; careless/inattentive; inattentive or lost in thought; or other distraction AND/OR (2015 and later) a driver charged with a violation of using a telecommunications device. Any pedestrian or bicyclist with an action of inattentive (talking, eating, etc.) or person-related factors of inattentive or portable electronic devices (e.g. cell phones, MP3 Player, PDA, etc.) | Any driver, pedestrian, or bicyclist with the following attributes reported in contributing circumstances: inattention; driver operating handheld telecommunications device; driver operating hands-free wireless telecommunications device; driver operating other electronic device; driver adjusting audio or entertainment system; driver smoking; driver eating or drinking; driver reading or writing; driver grooming; driver interacting with passengers, animals, or objects inside vehicle; other driver distractions inside vehicle; other driver distractions outside vehicle; or unknown driver distraction. |
| Speeding | Any driver exceeding the posted speed limit or driving too fast for conditions at the time of the collision as indicated by the investigating officer. | Any driver exceeding the posted speed limit or driving too fast for conditions at the time of the crash as reported by the investigating officer in contributing circumstances. |

| Measures | Fatality Definition<br>**From FARS database** | Serious Injury Definition<br>**From CLAS database** |
|---|---|---|
| Unrestrained Passenger Vehicle Occupants | A fatally injured driver or passenger of a passenger vehicle (excluding limousines, three-wheel automobiles, motorhomes, school and transit buses, and medium/heavy trucks used to haul trailers) who was either not restrained or improperly restrained at the time of the crash. | A seriously injured driver or passenger in a vehicle type of 'Passenger Car', 'Pickup, Panel Truck or Vanette under 10,000 lb', 'Taxi' AND restraint system type of 'No Restraints Used'. |
| Crash Type | Fatality resulting from a collision that involved… | Serious injury resulting from a collision that involved… |
| Lane Departure | Derived from CLAS and flagged in FARS. Uses the same criteria described in the "Serious Injury" column. | A run-off-the-road event defined as the primary collision type is reported as 'one parked-one moving', 'struck fixed object', 'struck other object', or 'vehicle overturned' AND object struck is NOT 'Animal-Drawn Vehicle', 'Closed Toll Gate', 'Domestic Animal (ridden)', 'Drawbridge Crossing Gate Arm', 'Fallen rock hit by vehicle (on the road)', 'Fallen Rock or Tree Hit by Vehicle', 'Fallen tree hit by vehicle (on the road)', 'Falling rock on vehicle (on the road)', 'Falling Rock or Tree Fell on Vehicle', 'Falling tree on vehicle (on the road)', 'Manhole Cover', 'Miscellaneous Object or Debris on Road', 'Mud or Landslide', 'Not Stated', 'Railway Crossing Gate', 'Reversible Lane Control Gate', 'Snowslide', 'Toll Booth', 'Toll Booth Island', 'Underside of Bridge', or miscellaneous object or debris on road AND junction relationship is 'At Driveway but Not Related', 'At Intersection and Not Related', 'At Roundabout but not Related', 'Not at Intersection and Not Related' AND the first impact location code is NOT 'A1', 'A2', 'A3', 'A4', 'A5', 'A6', 'AA', 'AB', 'AC', 'C1', 'D1', 'D2', 'D3', 'D4', 'D5', 'D6', 'DA', 'DB', 'DC', 'H1', 'H2', 'H3', 'H4', 'H5', 'H6', 'L1', 'L2', 'L3', 'L4', 'L5', 'L6', 'M1', 'M2', 'M3', 'M4', 'M5', 'M6', 'N1', 'N2', 'N3', 'N4', 'N5', 'N6', 'P1', 'P2', 'P3', 'P4', 'P5', 'P6', 'Q1', 'Q2', 'Q3', 'Q4', 'Q5', 'Q6', 'R1', 'R2', 'R3', 'R4', 'R5', 'R6', 'S1', 'S2', 'S3', 'S4', 'S5', 'S6', 'V1', 'V2', 'V3', 'V4', 'V5', 'V6', 'X1', 'X2', 'X3', 'X4', 'X5', 'X6'. Lane Departure also includes collisions resulting from opposite direction travel (head-on) defined as the primary collision type reported as 'From opposite direction – both moving – head-on', 'From opposite direction – one stopped – head-on', 'From opposite direction – both going straight – sideswipe', 'From opposite direction – both going straight – one stopped – sideswipe', 'From opposite direction – all others. Exclude cases if the vehicle action is 'Going Wrong Way on Divided Highway', 'Going Wrong Way on Ramp', 'Going Wrong Way on One-Way Street or Road' and cases with corresponding junction relationships of described in the intersection definition.' |

| Measures | Fatality Definition<br>**From FARS database** | Serious Injury Definition<br>**From CLAS database** |
|---|---|---|
| Intersections | Derived from CLAS and flagged in FARS. Uses the same criteria described in the "Serious Injury" column. | A junction relationship reported as at intersection and related; intersection-related but not at intersection; at driveway within major intersection; entering roundabout; circulating roundabout; exiting roundabout; roundabout related but not at roundabout; or traffic calming circle. |
| Road Users | Fatality resulting from a collision that involved… | Serious injury resulting from a collision that involved… |
| Young Driver Ages 16-25 Involved | Any driver between the ages of 16 and 25 years. Counts of fatalities involving a certain driver group do not imply that driver to be "at fault". | Any driver between the ages of 16 and 25 years. Counts of serious injuries involving a certain driver group do not imply that driver to be "at fault". |
| Pedestrians | A fatal person type coded as pedestrian or person on personal conveyances. | A seriously injured person coded as pedestrian (includes person on foot, roller skater/skateboarder, wheelchair, flagger, roadway worker, and EMS personnel). |
| Bicyclists | A fatal person type coded as bicyclist or other cyclist. | A seriously injured person coded as pedcyc driver or pedcyc passenger (includes bicycles and tricycles). |
| Motorcyclists | A vehicle body type coded as motorcycle; moped/ motorized bicycle; three-wheel motorcycle/moped; off-road motorcycle; motor scooter, unenclosed/enclosed three-wheel motorcycle/autocycle; and other motored cycle types (mini-bikes, pocket motorcycles, "Pocket bikes"). | A vehicle type reported as motorcycle, scooter bike, or moped. |
| Older Driver Involved (age 70+) | Any driver age 70 years or older. Counts of fatalities involving a certain driver group do not imply that driver to be "at fault". | Any driver age 70 years or older. Counts of serious injuries involving a certain driver group do not imply that driver to be "at fault". |
| Heavy Truck Involved | Any vehicle coded as 'step van >10,000lbs', 'single-unit straight/cab chassis, GVWR >10,000lbs or unknown', ' Truck-tractor', 'Medium/Heavy P/U >10,000lbs', 'Unk unit or combination >10,000lbs', 'Unk medium/heavy truck type', OR 'Unk truck (light, medium, heavy) with one or more trailers'. Counts of fatalities involving a certain driver group do not imply that driver to be "at fault". | Any vehicle that also has a vehicle classification of 'trailer with GVWR of 10,001 lbs. or more, if GVWR of combined vehicle(s) is 26,001 lbs or more – CDL required', 'single vehicle with GVWR of 26,001 lbs. or more; or any school bus regardless of size – CDL required', 'single vehicle of 26,000 lbs. or less, designed to carry 16 passengers or more; or any vehicle regardless of size which requires HAZ MAT Placard -CDL required' or a commercial vehicle supplement to the collision report; OR a vehicle type reported as 'truck (flatbed, van, etc.)', 'truck and trailer', 'truck tractor', 'truck tractor and semi-trailer', or 'truck-double trailer combinations'; OR a vehicle usage classification reported as concrete mixer, dump truck, logging truck, refuse/recycle truck, vannette over 10,001 lbs., tanker truck, tow truck, or auto carrier. Counts of serious injuries involving a certain driver group do not imply that driver to be "at fault". |

| Measures | Fatality Definition<br>**From FARS database** | Serious Injury Definition<br>**From CLAS database** |
|---|---|---|
| Other Monitored Areas | Fatality resulting from a collision that involved… | Serious injury resulting from a collision that involved… |
| Drowsy Driver Involved | Any driver with a driver related factor coded as 'drowsy, sleepy, asleep, fatigued' (2009 and prior) or a driver condition coded as asleep or fatigued (2010 and later). | Any driver apparently asleep or apparently fatigued as reported by the investigating officer in the contributing circumstances. |
| Work Zone Involved | A work zone status coded as construction; maintenance; utility; or work zone, type unknown. | A work zone status reported as within work zone or in external traffic backup caused from work zone. |
| Wildlife Involved | A sequence of events coded as animal. | A collision type reported as non-domestic animal (2008 and prior) or a collision type reported as vehicle strikes deer; vehicle strikes elk; or vehicle strikes all other non-domestic animal (2009 and later). |
| School Bus Involved | A vehicle coded as school bus. | A vehicle type reported as school bus. |
| Vehicle Train | A sequence of events coded as railway train. | A collision type reported as train struck moving vehicle; train struck stopped or stalled vehicle; vehicle struck moving train; or vehicle struck stopped train. |

# Appendix F: Data Nuances

## What the Data Can and Cannot Tell Us

Crash data analysis is complex and can include many different levels of focus, including crash factors surrounding:

- **Event:** weather, lighting conditions, road surface conditions, and other circumstances.
- **Vehicle:** motorcycles, heavy trucks, and other vehicles.
- **People:** such as drivers, vehicle passengers, and people walking and biking—both surviving and deceased.

### Unit of Reporting

The unit of reporting also adds a level of nuance to crash data. The unit of reporting for most of Target Zero is the people who are killed or seriously injured. For example, the Distraction chapter reports on fatalities and serious injuries involving any distraction, either a distracted driver or other road user. However, it does not include data on the number of distracted drivers or road users. For instance, in a fatal crash between a motorist and a pedestrian, it is possible that both parties were distracted, but in the data this would only be counted as one distracted fatality. In some cases, the distracted driver or pedestrain IS the person fatally or seriously injured, but sometimes it is not. This is true for the data reported in the Impairment, Distraction, Speeding, Young Drivers, Motorcyclists, Older Drivers, and Heavy Truck chapters.

In addition to these complexities, the following data limitations add further nuance to what the data does or does not tell us.

### Crash Culpability and Fault

Washington is considered a "no-fault" state, meaning that law enforcement personnel do not indicate which party was actually at fault when investigating crashes. Instead, they record driver and other road user circumstances contributing to the crash, such as impairment or speeding. In crashes where only a single vehicle is involved, or only one driver or road user is recorded as having contributing circumstances, then crash fault can be assumed.

However, in the absence of a standard approach to assigning culpability in crashes involving multiple units and multiple persons with contributing circumstances, comprehensive analysis centered on crash "fault" is not possible. This is important to keep in mind when considering analysis in chapters such as Young Drivers. The data shown are a simple count of all fatalities or serious injuries involving a young driver, but do NOT indicate that the young driver is always the one at fault in these crashes. Occasionally, agencies may conduct internal reviews of crash reports to assign fault for a specific emphasis area. This information is presented in the chapters if it was available.

### Data Inclusion Criteria

The Fatality Analysis Reporting System (FARS) is the official source of traffic fatality information for Washington State. Specific criteria must be met in order for a death to be counted in FARS. The crash must involve at least one motor vehicle in-transport on a roadway open to the public and involve at least one fatality that was not a result of intentional or natural causes within 30 days (720 hours) of the crash. For these reasons, other sources of traffic fatality information, such as those from the statewide crash data or vital statistics data, often do not match the counts in FARS.

## Advanced Driver Assistance Systems (ADAS)

There are vehicles on the road today that have Level 1 or 2 automation features for safety, or ADAS, such as automatic forward collision breaking and lane keeping. Data regarding the role of these systems when crashes occur are limited. This issue is further complicated by the driver's ability to turn off some of these safety features, and potential driver inattention caused by over-dependence on these systems. Some vehicle manufacturers include ADAS information with the Vehicle Identification Number (VIN), but currently the information is scarce.

Automated technology has the potential to save lives and prevent injury, so it is important that Washington improve data collection regarding ADAS presence and use in crash-involved vehicles. Additional ADAS data needs include:

- The percent of vehicles on the road with ADAS features.
- Systems in operation at the time of a crash.
- Impact of ADAS on crash outcomes.
- Functional differences in the same ADAS feature across different vehicle makes and models.
- Public understanding and acceptance of automated vehicles.

Additional information on automated vehicles and ADAS can be found in the Cooperative Automated Transportation—Includes Automated Vehicles chapter on page 184.

## Impairment-Involved Crashes

Only fatal crashes are consistently linked with toxicology reports. Under Washington State law, any person involved in a traffic crash who dies within four hours of that crash will be blood tested for intoxicants. The only other testing that occurs is among surviving drivers where probable cause for impairment is present.

When a toxicology test is performed on any person in a fatal crash, including surviving drivers, the FARS analysts receive those toxicology reports directly from the lab. The statewide crash database relies on officer supplemental reports to complete the impairment information, which is an inconsistent reporting method for toxicology outcomes. For this reason, comparisons between FARS fatalities and fatalities in the statewide database confirm under-reporting of drug and alcohol results to the statewide crash database. Due to this under-reporting, meaningful and complete analysis of impairment involvement is restricted to only FARS data.

## Speeding-Involved Crashes

The actual travel speed of a vehicle is not recorded on Washington's crash reporting form, only the roadway posted speed. Technical Reconstructionist reports will sometimes have the calculated travel speed, but not consistently. Therefore, analysts do not know how fast vehicles were actually going at the time of the crash. Furthermore, the majority (at least two-thirds) of speed-related crashes are coded as "Exceeding Reasonable Safe Speed" as opposed to "Exceeding Stated Speed Limit."

Speeding-involved crashes is the only emphasis area that experienced a decrease in both fatalities and serious injuries during the past three years. This is unlikely a meaningful reduction, but rather a function of previous over-reporting. Since Washington strengthened the state's distracted driving laws, it has anecdotally been reported that officers are now coding distraction at a higher rate, versus "Exceeding Reasonable Safe Speed," because now there is a distraction citation that applies to all distraction from cell phones, instead of texting only. While this has not yet been measured, the Data Analyst Group (DAG) will review this issue.

## Distraction-Involved Crashes

It is suspected that distraction involvement in serious crashes is generally under-reported. Officers are reluctant to record specific distractions contributing to the crash without defensible proof. Even witness accounts of driver cell phone use in crash report narratives do not always mean that the driver is coded as being distracted in the contributing circumstances. When distraction is coded, in more than two-thirds of the cases the distraction is coded as general "inattention."

## Motorcyclist Crashes

For this edition of Target Zero, the definition of motorcyclists was expanded to include motor scooters, mopeds, and motorized bicycles. The extended definition now aligns with the National Highway Traffic Safety Administration's definition of a motorcycle. In Washington, an endorsement is required to operate a motorcycle unless the vehicle is a two-wheeled motorcycle or scooter with a 50 cubic centimeter or smaller engine and has a maximum speed of 30 miles per hour. The definition of motorcycle is driven by how the officer reports the vehicle type and information obtained from vehicle identification numbers (VINs), independent of whether or not an endorsement is required. Therefore, there may be motor scooters, mopeds, and motorized bicycles involved in fatal or serious injury crashes that do not require an endorsement but are classified as "motorcyclists" under the new expanded definition.

## Heavy Truck-Involved Crashes

The data used for the Heavy Truck chapter is based on vehicle type and weight, independent of whether or not it is a commercial vehicle. The strategies relate largely to commercial vehicles, yet that is not exactly what is measured. The Washington State Patrol maintains a database for the Federal Motor Carrier Safety Administration (FMCSA) that captures crash data when a commercial vehicle heavy truck is involved. While the data definitions match regarding vehicle weight requirements, the data in FARS that is used in the chapter may also include non-commercial vehicles, such as large vans and heavy pickup trucks. Work is currently underway to better reconcile the FMCSA data with the FARS data and to explore the use of the FMCSA commercial vehicle data for the next edition of Target Zero.

THIS PAGE INTENTIONALLY LEFT BLANK

# Appendix G: Strategy Definitions and Criteria

Most chapters of Target Zero contain a list of strategies that practitioners from all disciplines can use to reduce traffic fatalities. This appendix describes how Target Zero analysts evaluate these strategies for inclusion in the plan.

- Strategies listed in Target Zero are given an effectiveness designation of proven, recommended, or unknown as described in the table below. For this review process, Target Zero evaluators chose three main resources to serve as the foundation for the designations:
- Countermeasures That Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices (9th Edition 2017), which focuses on behavior.
- The National Cooperative Highway Research Program Report 500 Series, which focuses on both engineering and behavior.
- Crash Modification Factors Clearinghouse, which focuses on engineering.

Disagreement among these sources is rare, but when it happens, evaluators defer to the source that is most aligned with the type of strategy. Therefore, in general, Countermeasures That Work usually takes precedence for behavior/program strategies, Crash Modification Factors takes precedence for engineering strategies, and the NCHRP report prevails when a strategy is not present in either of the first two sources.

| Strategy Effectiveness in Target Zero | Target Zero Definition | Countermeasures That Work | NCHRP 500 Report | Crash Modification Factors (CMF) Clearinghouse |
|---|---|---|---|---|
| Proven | Demonstrated to be effective by several evaluations with consistent results. | ★★★★★Demonstrated to be effective by several high-quality evaluations with consistent results. | **Proven (P).** Those strategies that have been used in one or more locations and for which properly designed evaluations have been conducted which show them to be effective. | ★★★★★= 14 quality points<br>★★★★= 11–13 quality points |
| Recommended | Generally accepted to be effective based on evaluations or other sources. | ★★★★ Demonstrated to be effective in certain situations, or<br>★★★Likely to be effective based on balance of evidence from high-quality evaluations or other sources. | **Tried (T).** Those strategies that have been implemented in a number of locations, and may even be accepted as standards or standard approaches, but for which there have not been found valid evaluations. | ★★★= 7–10 quality points |
| Unknown | Limited evaluation evidence, or experimental. | ★★ Effectiveness still undetermined; different methods of implementing this countermeasure produce different results.<br>★Limited or no high-quality evaluation evidence. | **Experimental (E).** Those strategies representing ideas that have been suggested, with at least one agency considering them sufficiently promising to try them as an experiment. | ★★ = 3–6 quality points |

Evaluators reviewed each of these publications for the Target Zero plan. They looked for the strategies that Target Zero's statewide partners identified to reduce fatalities and serious injuries, and compared them with the designations adopted according to the table. In some instances, partners slightly modified strategies to be more specific to Washington State, but their strategies were still aligned with the strategies in these publications, and therefore designated the same.

If evaluators could not find a strategy in the three resources described in the table, then they conducted further review, in the following order:

- Was the strategy supported with published, favorable outcomes in the form of a meta-study (a review of several related studies for methodological strength and consistent outcomes)? If yes, these strategies were designated proven with META as the source.
- Was the strategy supported by extensive literature but lacks a meta-study? If yes, these strategies were designated proven or recommended with LIT as the source, dependent on evaluation of the quality and outcomes of the available literature.
- Was the strategy a recommendation supported by a state or federal agency, backed by cited evaluation/data? If yes, these strategies were designated recommended with the supporting agency as the source.
- If a strategy did not meet the proven or recommended criteria, or did not meet one of the criteria listed above, then the strategy was designated unknown. The unknown designation was assigned to strategies when:
    - The strategy was listed in one of the three main resources with lower quality ratings.
    - The literature was insufficient to designate it as recommended.
    - There was sufficient literature, but outcomes were inconsistent and inconclusive between studies.

While the proven, recommended, and unknown designations provide some indication of relative effectiveness, any system for weighting traffic safety strategies is imperfect. The particular context in which a strategy is employed is immensely important and difficult to capture in prioritization systems. Nevertheless, as a general rule, organizations should give priority to strategies listed as proven, followed by those designated as recommended. Strategies listed as unknown should only be utilized when proven and recommended strategies are not viable, or when the unknown strategy is truly innovative and promising. In cases where an unknown strategy is selected for implementation, organizations should develop a straightforward plan for evaluation to add to the body of knowledge and enhance future decision-making.

# Appendix H: Federal Requirements

*This appendix explains the federal requirements regarding establishing and updating the Strategic Highway Safety Plan (SHSP) for all 50 states. Target Zero is Washington's SHSP.*

Two major federal laws influence the content and implementation of Target Zero: Moving Ahead for Progress in the 21st Century (MAP- 21) Act and the Fixing America's Surface Transportation (FAST) Act.

Under these laws, the Federal Highway Administration (FHWA) sets policy that guides the implementation and evaluation of the SHSP.

FHWA published their Highway Safety Improvement Program (HSIP) Final Rules with an effective date of April 14, 2016. These Final Rules implement the HSIP requirements established in MAP-21 and the FAST Act, and establish clear requirements for updating the state's SHSP.

The HSIP is a core federal-aid program with the purpose of achieving a significant reduction in fatalities and serious injuries on all public roads. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance. The HSIP regulation under 23 CFR 924 establishes the FHWA's HSIP policy, as well as program structure, planning, implementation, evaluation, and reporting requirements which states must follow to successfully administer the HSIP. The HSIP Final Rule updates HSIP requirements under 23 CFR 924 to be consistent with MAP-21 and the FAST Act, and clarifies program requirements.

In addition to clarifying other programs, the HSIP Final Rule contains performance management requirements for SHSP updates. FHWA has been working in partnership with key stakeholders for many years to prepare for these new rules. They will reinforce a data-driven approach to making safety decisions, improve collaboration across a wide range of safety partners, and provide transparency for the American public as states set goals, report on safety targets and, most importantly, save lives.

## Meeting Federal Requirements for Target Zero

23 USC 148 requires all states to have an updated, approved SHSP which is consistent with specific requirements under section 148. The updated SHSP must be submitted to the FHWA Division Administrator, who will ensure that the state has followed a process that meets these requirements.

The FHWA provides an SHSP Process Approval Checklist, which is a tool to help Division Offices assess the process and completeness of the SHSP update. The requirements outlined in the Process Approval Checklist include detailed specific Indicators and Considerations which must be met by the state. Washington's plan has met all requirements in the past, and believes that it has met them with the 2019 update as well.

- Consultation with appropriate stakeholders and traffic safety partners during the update process
- Comprehensive use of data to develop plan emphasis areas and safety improvement strategies, including safety data from non-state-owned public roads and tribal land
- Performance management and adoption of performance-based goals which are consistent with established safety performance measures
- Employing a multi-disciplinary approach which addresses engineering, management, operations, education, enforcement, and emergency services elements of highway safety as key features when determining SHSP strategies

- Coordination with other state, regional, local, and tribal transportation and highway safety planning processes; a demonstration of consultation among partners in the development of transportation safety plans; and an SHSP which provides strategic direction for other transportation plans
- An implementation focus which describes process, actions, and potential resources for implementing the strategies in the emphasis areas
- Requirements to evaluate the SHSP as part of the HSIP update process, including confirming the validity of the emphasis areas and strategies based on analysis of safety data, and identifying issues related to the SHSP's process, implementation, and progress
- Special rules which require including the state's definition of High Risk Rural Road and strategies to address the increases in older driver and pedestrian traffic fatalities and serious injuries, if applicable
- A detailed description of the SHSP update process, included as a section, chapter, or appendix in the SHSP
- A requirement to complete the SHSP update no later than five years from the date of the previous approved version
- A requirement that the SHSP be approved and signed by the Governor of the state or a state official that is delegated by the Governor
- Approval by the FHWA Division Administrator

# Appendix I: Performance Based Goals

Washington's goal is to reduce traffic fatalities and serious injuries to zero by 2030. While aspirational, this target recognizes that our personal goals and the state's goal should be the same: you, your family, and your friends all make it home safely. To achieve this, partners across the state have a responsibility to implement strategies (countermeasures) that have the highest likelihood of reducing the frequency and severity of crashes.

Washington's safety partners use performance metrics to track and understand system performance and needs over time. The goal is to make our efforts as effective as possible. Data from crashes involving fatalities and serious injuries form the basis for the emphasis areas and their priorities within Target Zero in the categories of high-risk behavior, crash types, and road users. The higher the relative contribution to fatalities or serious injuries statewide, the higher the priority ranking of the particular emphasis area. See the priority table page 11 for more information.

Safety partners can use this information to identify contributing factors that are leading to these high severity crashes throughout the system. For instance, Target Zero has identified lane departure crashes as a Priority Level One emphasis area. The next step would be to screen the network to identify segments or intersections on the road network or characteristics for locations experiencing more than the expected number of high severity lane-departure crashes. Further analysis of the contributing factors to these crashes can then provide insights into the type of countermeasures that would have a high potential to reduce the number and severity of this particular group of crashes. These countermeasures can be in the form of education and outreach, enforcement, engineering (infrastructure), emergency medical services, evaluation, leadership, or a combination of each.

The performance metrics help us evaluate how effective these strategies have been in reducing the targeted types of crashes. Target Zero does not evaluate an individual project's or program's effectiveness. Instead, it focuses on the overall performance of the system, setting performance based goals across emphasis areas.

## Washington's Performance Goals

State agencies are responsible for the administration of federal safety funds from the U.S. Department of Transportation report, and set annual performance goals. The Federal Highway Administration (FHWA) and National Highway Traffic Safety Administration (NHTSA) agree that zero fatalities on our nation's roads is the only acceptable goal. However, agencies recognize that reaching zero fatalities will require time and significant effort by many different partner agencies and that interim goals will be necessary.

Targets for FHWA's and NHTSA's performance metrics are interim measures along the way to the zero goal. Washington's annual targets are data-driven, realistic, and intended to be achievable.

In Washington, WSDOT and the WTSC have three overlapping performance goal areas and targets required as part of federal reporting. The three overlapping measures that are set in collaboration between WSDOT and WTSC are shaded in the following table.

| Washington State's Traffic Safety Performance Goals | |
|---|---|
| WSDOT Annual Traffic Safety Performance Goals<br>FHWA Highway Safety Improvement Program (HSIP)*<br>*Due August 31* | WTSC Annual Traffic Safety Performance Goals<br>NHTSA Highway Safety Plan (HSP)*<br>*Due July 1* |
| Number of traffic fatalities on all public roads (FARS). | |
| Number of fatalities per 100 million vehicle miles traveled (VMT) on all public roads (FARS/FHWA). | |
| Number of serious injuries on all public roads (State Data). | |
| Number of non-motorist fatalities and serious injuries on all public roads (e.g. bicyclists and pedestrians**) (FARS/State Data). | Number of pedestrian** fatalities (FARS). |
| Number of serious injuries per 100 million VMT on all public roads (State Data/FHWA). | Number of bicyclist fatalities (FARS). |
| | Number of unrestrained passenger vehicle occupant fatalities, all seat positions (FARS). |
| | Number of motorcyclist fatalities (FARS). |
| | Number of unhelmeted motorcyclist fatalities (FARS). |
| | Number of drivers age 20 or younger involved in fatal crashes (FARS). |
| | Number of speeding-related fatalities (FARS). |
| | Number of fatalities involving a driver with a BAC of .08 and above (imputed) (FARS). |
| | Observed seat belt use for passenger vehicles, front seat outboard occupants (survey). |
| | Number of seat belt citations, impaired driving arrests, and speeding citations issued during grant-funded enforcement activities. |

*Quantifiable targets are set annually and can be found in the HSIP at www.wsdot.wa.gov/LocalPrograms/Traffic/FedSafety.htm and in the HSP at https://www.nhtsa.gov/highway-safety-grants-program/state-highway-safety-plans-and-annual-reports

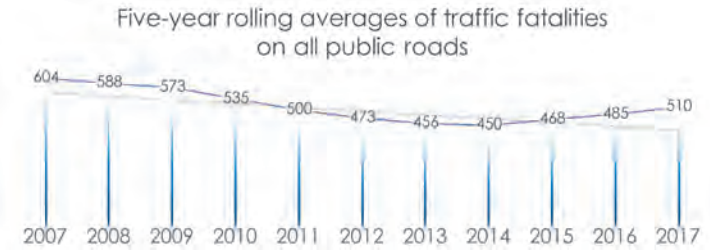
**Although the measure of pedestrian fatalities is from the same data source (the Fatality Analysis Reporting System, FARS), the person type criteria used to define pedestrians differ between FHWA and NHTSA. Therefore, the sum of the NHTSA pedestrian and bicyclist fatality performance measures do NOT match the FHWA non-motorist performance measure fatality counts.

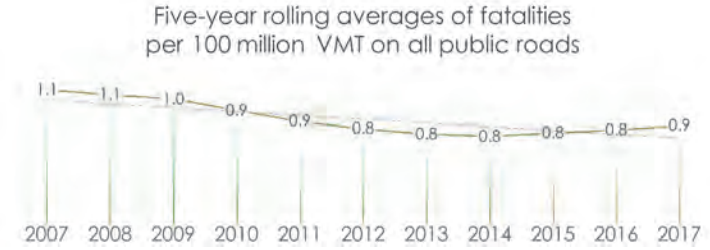
## Calculating Annual Targets

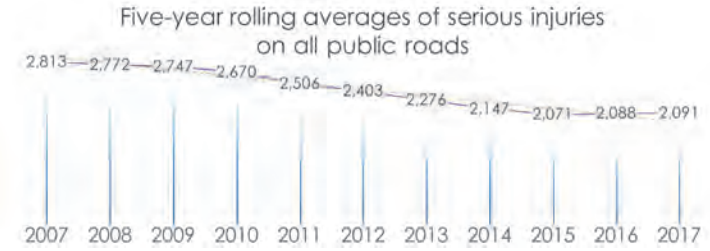
The targets are updated and reported annually in Washington's Highway Safety Plan, submitted by WTSC, and Washington's Highway Safety Improvement Program, submitted by WSDOT.

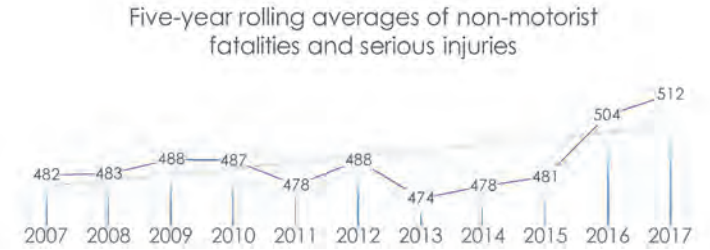
Target-setting methodologies can change, and readers should refer to the HSP and HSIP for the most up-to-date information. Target Zero analysts set annual targets using trend line projections, which are then compared to the Target Zero line. That data, plus the most recent preliminary year of data, is then used to calculate seven 5-year rolling averages for trend line projections. However, Target Zero values do not include the preliminary data, and therefore are only calculated using six 5-year rolling averages. The exception to this method is when the trend line value is higher than the most recent 5-year rolling average. In these instances, the annual goal is set equal to the most recent 5-year average (maintenance goals).

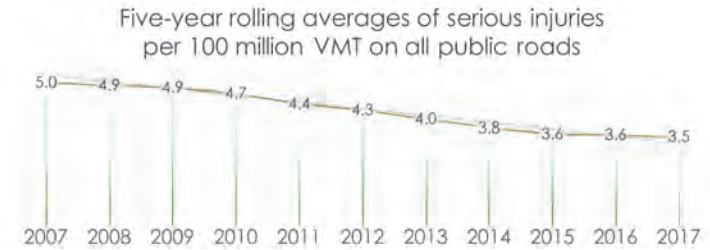
Target Zero generally looks at a projecting trend line towards the 2030 goal. A one-year look at the targets provide only a limited and variable perspective on where Washington State actually is in terms of traffic safety goals. This type of look captures "noise" in the data, while a longer look smooths out that noise and shows overall trends. For these reasons, we present the overall target data in Target Zero, but refer readers to the HSP and HSIP for the current targets and explanation.



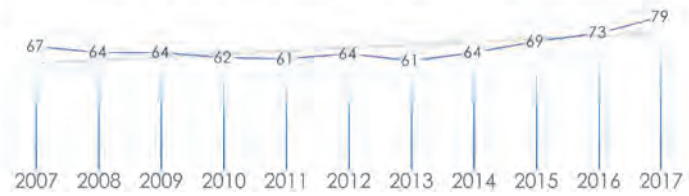



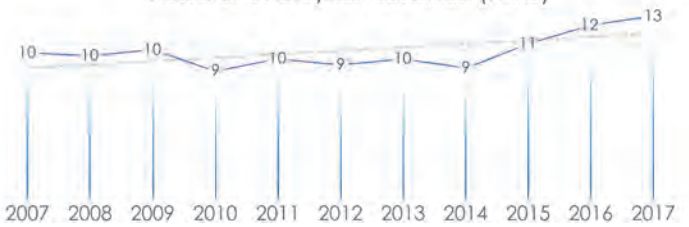



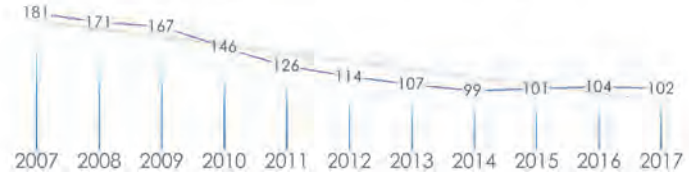
Five-year rolling averages of pedestrian fatalities




Number of bicyclist fatalities (FARS)

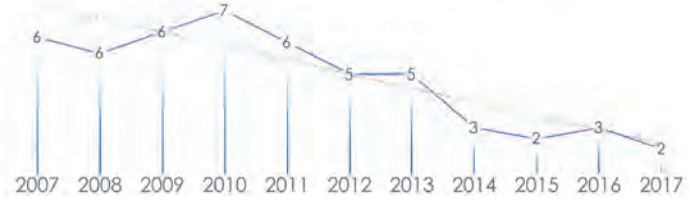



Five-year rolling averages of unrestrained passenger vehicle occupant fatalities, all seat positions



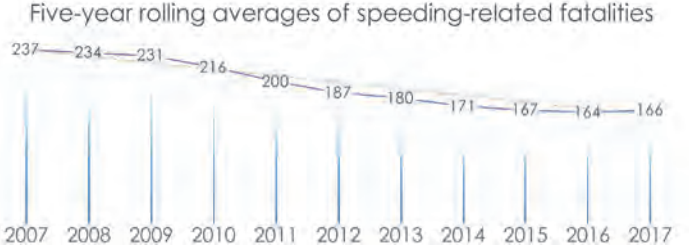

Five-year rolling averages of motorcyclist fatalities


Five-year rolling averages of unhelmeted motorcyclist fatalities

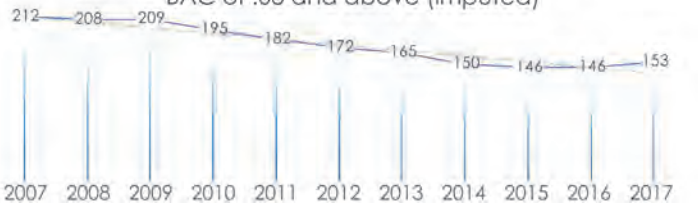



Five-year rolling averages of drivers age 20 or younger involved in fatal crashes


Five-year rolling averages of speeding-related fatalities




Five-year rolling averages of fatalities involving a driver with a BAC of .08 and above (imputed)



# Appendix J: Target Zero Plan Development

Developing and writing Target Zero is a multi-year process and a collaboration across many groups. This appendix describes the process of developing the plan.

In 2018, the Washington Traffic Safety Commission (WTSC) and the Washington Department of Transportation (WSDOT) partnered to develop the 2019 Washington State Target Zero Strategic Highway Safety Plan (SHSP). Over 25 organizations directly contributed to the development of this new SHSP, and dozens of others advised the project along the way.

It's the intention of these traffic safety partners to use the plan to coordinate traffic safety programs across the state, align priorities and strategies among the various partners, and provide a common language and approach for traffic safety efforts.

The Target Zero partners have revised and updated the plan several times since the first edition in 2000. In the 2019 plan, faced with increasing trends in fatalities and serious injuries, we took a more action-oriented approach. We believe this will provide critical focus for the many partners who implement the strategies in the plan.

We began the project by establishing the **Data Analyst Group**, a partnership of data experts from state agencies that manage Washington's core traffic safety data systems. The Data Analyst Group coordinated the update of the fatality and serious injury data, made data-based recommendations on which factors were the biggest contributors to deaths and serious injuries on our roadways, and developed the new Priority Table (on page 11). Later, they helped assess the effectiveness rating of the strategies listed in this plan (Proven, Recommended, or Unknown).

Along with the Data Analyst Group, a number of key partners came together in a formal, multi-disciplinary project structure to create the Target Zero Project Team and the Steering Committee.

The **Project Team** consisted of manager-level representatives who developed the project plan and timeline, coordinated a vast amount of work, made decisions regarding plan structure and content, wrote the plan sections and chapters, and evaluated strategies for inclusion in the plan. These contributors made the critical decision to make a more action-oriented plan, in response to the rising numbers of fatalities and serious injuries.

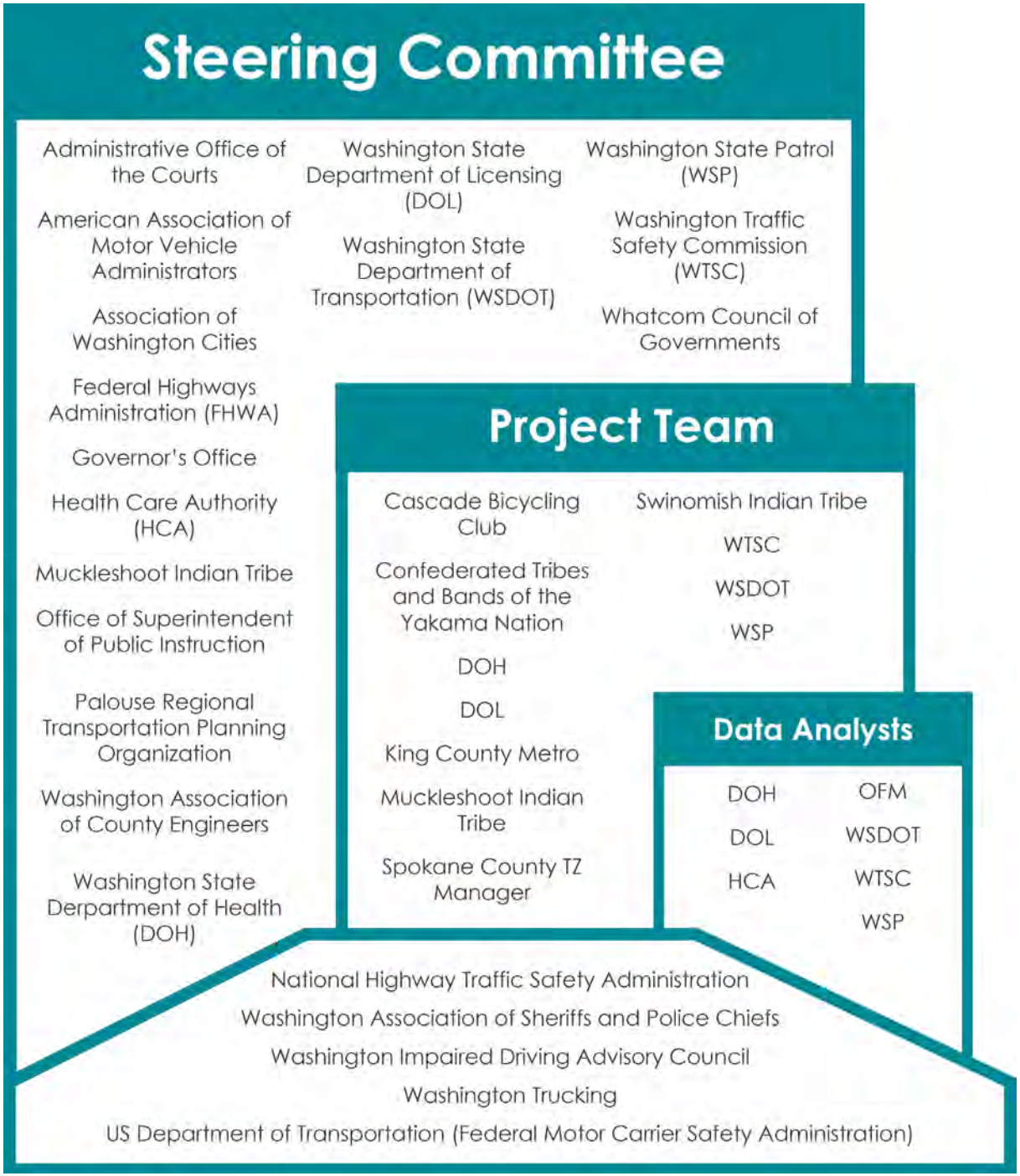
The **Steering Committee** consisted of senior-level management representatives who provided the project with strategic direction and executive guidance, and helped ensure the project had appropriate resources for success. They reviewed the plan, and supported any formal change requests from partners. The Steering Committee also recommended the plan for adoption by the WTSC.

In addition, the Target Zero Project Team received advice from leaders at the state and federal levels, including representatives from the Governor's Office, WSDOT, Administrative Office of the Courts, the U.S. Department of Transportation, the Federal Highway Administration (FHWA), and National Highway Traffic Safety Administration (NHTSA).

To round out the project and gather input from a broader stakeholder group, the Project Team held a Target Zero Partners Meeting in December 2018. More than 200 people involved in traffic safety from across the state attended. Together, they reviewed the preliminary data and new priorities, provided feedback and input on strategies for addressing some of the plan's priority areas, and gave insight into what specific traffic safety messages will best impact our target audiences.

In April 2019, the Project Team and Steering Committee distributed the draft 2019 Target Zero plan for external review by Tribes, partners, and other stakeholders. Over 34 respondents, representing members of the public, agencies, private sector companies, academic institutions, and professional associations, provided formal comment. Their input helped finalize the 2019 plan, and established a baseline for future revisions.

At the concluding stages of the Target Zero plan development, the Steering Committee sent the newly revised plan to the WTSC Commissioners and FHWA for their approval. In October 2019, the Commissioners delivered the final Strategic Highway Safety Plan to Governor Jay Inslee for his approval and signature.



# Appendix K: Safe Systems

## How does the Safe Systems Approach Relate to Vision Zero, Toward Zero Deaths, and Road to Zero?

Several initiatives with the Safe Systems approach are under way nationally and internationally, including Vision Zero, Toward Zero Deaths, and Road to Zero.

Vision Zero, adopted by Sweden in the late 1990s, and Sustainable Safety, adopted by the Netherlands in the 2000s, are founded in the principles of systematic safety. Vision Zero has been successful across Europe and is gaining momentum in major American cities through the efforts of the Vision Zero Network. In Washington, Seattle and Bellevue have formally adopted Vision Zero policies.

Toward Zero Deaths (TZD) is a national strategy for highway safety in the U.S., echoing the goal of zero fatalities and serious injuries. This initiative shares common components with Safe Systems in terms of users (drivers, passengers, and vulnerable users), vehicles, infrastructure, enhanced emergency medical services, and improved safety management.

Road to Zero is a coalition managed by the National Safety Council that includes USDOT (FHWA, NHTSA, Federal Motor Carrier Safety Administration), the Centers for Disease Control, National Association of State EMS Officials, and many other public and private organizations coming together to collaborate in strategies for zero fatalities by 2050.

While these campaigns each take their own approach to promotion of Safe Systems, they share several solution-oriented components with Target Zero:

- Recognition that deaths caused by motor vehicle crashes are preventable, not inevitable
- Consideration of the entire system (users, vehicles, and the environment), not just one element
- Evidence-based and data-driven approaches
- Embrace of a safe systems approach

And finally, they share a recognition that it takes people from all disciplines leveraging their subject matter expertise and collaborating in order to reach our common goal: zero deaths and serious injuries on our roads.

## International Examples of a Safe Systems Approach

In a 2008 report on the Safe Road Transport System Model and the Safe Systems definition, the Organisation for Economic Co-operation and Development's (OECD) International Transport Forum stressed that a Safe Systems approach is "the only way to achieve the vision of zero road fatalities and serious injuries and it requires that the road system be designed to expect and accommodate human error." The report further noted that a Safe Systems approach is appropriate for countries at all levels of road safety performance, with specific interventions likely to differ from country to country.

In places where the Safe Systems approach has been implemented, it has proven to reduce serious injury and fatal crashes.

## Equity: Essential Context for Application of the Safe Systems Approach

The Safe Systems approach is grounded in data analysis. It is essential that this analysis be structured to identify and address disparate traffic safety outcomes rooted in past policy decisions. The goal of zero fatalities and serious injuries for all is a universal goal; a targeted strategy that recognizes how different groups are affected in different ways will enable us to move most efficiently and effectively toward that goal.

Today, people living with lower socioeconomic status include an over-representation of people of color, the elderly, and people with disabilities; differing levels of infrastructure for traffic safety create and exacerbate health and transportation inequities.

Infrastructure investment focused on providing for the multimodal needs of historically underserved neighborhoods would be of significant benefit. Nationally, patterns of underinvestment in public safety infrastructure with roots in the public policies of the past have disproportionately affected lower income communities and neighborhoods with higher proportions of people of color. In these areas, residents experience reduced private vehicle ownership, an increased reliance on public and active transportation, and greater vulnerability across a number of indicators.

## Additional Resources


Casanova-Powell, Tara. 2019. "Speeding Away from Zero: Rethinking a Forgotten Traffic Safety Challenge." Spotlight on Highway Safety. Governors Highway Safety Association. https://www.ghsa.org/resources/Speeding19.

Cottrill, Caitlin D., and Piyushimita Thakuriah. 2010. "Evaluating Pedestrian Crashes in Areas with High Low-Income or Minority Populations." *Accident Analysis and Prevention 42, no. 6: 1718-28.* https://doi.org/10.1016/j.aap.2010.04.012.

Drive Tech. National Speed Awareness Course. Automobile Association. https://www.drivetech.co.uk/driver-awareness-courses/courses/national-speed-awareness-course.

Fischer, Pam. 2016. "Everyone Walks: Understanding & Addressing Pedestrian Safety." Governors Highway Safety Association. https://www.ghsa.org/sites/default/files/2016-12/FINAL_sfped_0.pdf.

Fleisher, A., Wier, M. L., & Hunter, M. (2016). "A Vision for Transportation Safety: Framework for *Identifying Best Practice Strategies to Advance Vision Zero." Transportation Research Record 2582, no. 1 (January): 72–86.* https://doi.org/10.3141/2582-09.

Gauvin, Lise, Lucie Richard, Cora Lynn Craig, Michaël Spivock, Mylène Riva, Mathieu Forster, et al. 2005. "From Walkability to Active Living Potential: An 'Ecometric' Validation Study." *American Journal of Preventive Medicine 28, no. 2 (February): 126-133* https://doi.org/10.1016/j.amepre.2004.10.029.

International Transport Forum. 2008. "Towards Zero: Ambitious Road Safety Targets and the Safe System Approach." Organisation for Economic Co-operation and Development (OECD) Publishing, Paris. https://doi.org/10.1787/9789282101964-en.

Karner, A., D. Rowangould, and J. London. 2016. "We Can Get There From Here: New Perspectives on Transportation Equity." *UC Davis: National Center for Sustainable Transportation.* https://escholarship.org/uc/item/9zp565xr.

LaChapelle, Ugo. 2014. "Walk, Bicycle, and Transit Trips of Transit-Dependent and Choice Riders in the 2009 U.S. National Household Travel Survey" *Journal of Physical Activity & Health 12, no. 2 (August): 1139–1147.* https://www.ncbi.nlm.nih.gov/pubmed/25347916.

Lawrence, Eric D., Nathan Bomey and Kristi Tanner. 2018. "Death on Foot: America's Love of SUVs Is Killing Pedestrians. *Detroit Free Press, July 1, 2018.* https://www.freep.com/story/money/cars/2018/06/28/suvs-killing-americas-pedestrians/646139002/.

Marshall, Wesley E. 2018. "Understanding International Road Safety Disparities: Why is Australia So Much Safer Than the United States?" *Accident Analysis & Prevention 111 (February 2018): 251-265.* https://doi.org/10.1016/j.aap.2017.11.031.

Miller, Greg. 2016. "Newly Released Maps Show How Housing Discrimination Happened." National Geographic News. October 17, 2016. https://news.nationalgeographic.com/2016/10/housing-discrimination-redlining-maps/.

Morency, P., L. Gauvin, C. Plante, M. Fournier and C. Morency. 2012. "Neighborhood Social Inequalities in Road Traffic Injuries: The Influence of Traffic Volume and Road Design." *American Journal of Public Health, 102, no. 6 (June): 1112-1119.* https://ajph.aphapublications.org/doi/10.2105/AJPH.2011.300528.

NTSB. 2018. Pedestrian Safety: Special Investigation Report. NTSB/SIR-18/03. Washington, D.C. https://www.ntsb.gov/safety/safety-studies/Documents/SIR1803.pdf.

NTSB. 2017. Reducing Speeding-Related Crashes Involving Passenger Vehicles. Safety Study. NTSB/SS-17/01. Washington, D.C. https://www.ntsb.gov/safety/safety-studies/Documents/SS1701.pdf.

Powell, L., S. Slater, and F. Chaloupka. 2004. "The relationship between community physical activity settings and race, ethnicity and socioeconomic status." *Evidence-Based Preventive Medicine 1: 135–144.* https://www.researchgate.net/publication/229042945.

Rothstein, Richard. 2017. *The Color of Law: A Forgotten History of How Our Government Segregated America. New York: Liveright Publishing.*

*Signor, K., Kumfer, W., LaJeunesse, S., & Carter, D. 2018. "Safe Systems Synthesis: An International Scan for Domestic Application." Final Report. Project no. SA-18-09-07, North Carolina Governor's Highway Safety Program.* https://www.roadsafety.unc.edu/wp-content/uploads/2018/08/SafeSystemsSynthesis-FinalReport_3.pdf.

Washington State DOH. Data and Statistical Reports. Health Data Visualization. Social Determinants of Health Dashboards. https://www.doh.wa.gov/DataandStatisticalReports/HealthDataVisualization/SocialDeterminantsofHealthDashboards.

Wilson, Dawn K., Karen A. Kirtland, Barbara E. Ainsworth, Cheryl L. Addy. 2004. "Socioeconomic Status and Perceptions of Access and Safety for Physical Activity." *Annals of Behavioral Medicine 28, no. 1 (August): 20–28.* https://doi.org/10.1207/s15324796abm2801_4.

THIS PAGE INTENTIONALLY LEFT BLANK

# Appendix L: Additional Resources

## Tribes and Target Zero


Centers for Disease Control and Prevention (CDC). n.d. Roadway to Safer Tribal Communities Toolkit. Accessed August 25, 2019. https://www.cdc.gov/motorvehiclesafety/native/toolkit.html.

CDC. 2016. Tribal Motor Vehicle Injury Prevention: Best Practices Guide. https://www.cdc.gov/motorvehiclesafety/pdf/native/TMVIP_Best-Practices_Guide_2016-a.pdf.

Federal Highway Administration (FHWA). 2016. Low-Cost Treatments for Horizontal Curve Safety Report no. FHWA-SA-15-084.

Tribal Transportation Safety Management System Steering Committee. Tribal Transportation Strategic Safety Plan. https://www.tribalsafety.org/reports#dm.


## Traffic Safety Culture


American Civil Liberties Union. Police Excessive Force. https://www.aclu.org/issues/criminal-law-reform/reforming-police-practices/police-excessive-force.

Center for Health and Safety Culture. n.d. *An Assessment of Traffic Safety Culture Related to Engagement in Efforts to Improve Traffic Safety. Final Report. Montana State University. Accessed August 25, 2019.* https://chsculture.org/general-news/an-assessment-of-traffic-safety-culture-related-to-engagement-in-efforts-to-improve-traffic-safety/.

Chin, Kathy Ko. 2016. "Health Equality: U.S. Department of Health and Human Services (HHS) Must Improve Language Access to Make Meaningful Access a Reality." Health Affairs. July 22, 2016. https://www.healthaffairs.org/do/10.1377/hblog20160722.055907/full/.

Delude, Cathryn M. 2008. "Culture Influences Brain Function, Study Shows." *Tech Talk 52, no. 14 (January 30, 2008). Massachusetts Institute of Technology.* http://news.mit.edu/2008/psychology-0111.

Gardner, Trevor G. 2014. "Racial Profiling as Collective Definition." *Social Inclusion 2, no. 3: 52-59.* https://www.cogitatiopress.com/socialinclusion/article/view/126/pdf_6.

Jackson, Joe. 2018. "Police Diversity without Inclusion Won't Lower Police Violence." The Greenlining Institute. http://greenlining.org/blog/2018/police-diversity-without-inclusion-wont-lower-police-violence/.

Literacy Pittsburgh. Causes of Low Literacy. https://www.literacypittsburgh.org/the-challenge/.

National Academies of Sciences, Engineering, and Medicine. 2018. *A Strategic Approach to Transforming Traffic Safety Culture to Reduce Deaths and Injuries. Washington, DC: The National Academies Press.* https://doi.org/10.17226/25286.

Peterson, Abby and Malin Åkerström. 2011. "Introduction to the Special Issue 'Policing Ethnicity: Between the Rhetoric of Inclusion and the Policies and Practices of Exclusion.'" *Social Inclusion 2, no. 3: 1-4.* https://www.cogitatiopress.com/socialinclusion/article/view/189/112.

Roat, Cindy. 2011. Why Language Access? Patient Populations Are Changing. http://cindyroat.com/why-language-access/.


## Impairment


American Medical Association. 1986. "Alcohol and the Driver." *Journal of the American Medical Association* 255, no. 4 (January):522-527. https://doi.org/10.1001/jama.1986.03370040096031

Tefft, Brian C. 2018. "Acute Sleep Deprivation and Culpable Motor Vehicle Crash Involvement." *Sleep* 41, no. 10 (October). https://doi.org/10.1093/sleep/zsy144.

## Distraction


Cherry, Kendra. 2019. "Inattentional Blindness in Psychology." Verywell Mind. https://www.verywellmind.com/what-is-inattentional-blindness-2795020

SurveyUSA. 2018. Results of SurveyUSA Mkt Research Study #24067. King County Target Zero Task Force. Survey results : http://www.surveyusa.com/client/PollReport.aspx?g=85ba5081-1100-4f93-9953-ac3f1ee3d95e

Tison, J., N. Chaudhary, and L. Cosgrove. 2011. *National phone survey on distracted driving attitudes and behaviors. Report No. DOT HS 811 555. Washington, DC: NHTSA.* https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/811555.pdf.

Washington Traffic Safety Commission (WTSC). 2018. *Distracted Driving in Washington State, 2016-2018: Final Results from the Annual Observation Surveys*. WTSC. http://wtsc.wa.gov/wp-content/uploads/dlm_uploads/2019/01/2018-DD-REPORT.pdf.


## Speeding


Insurance Institute for Highway Safety (IIHS). 2019. Advanced Driver Assistance Overview. Topics. https://www.iihs.org/topics/advanced-driver-assistance.

IIHS. 2016. Front Crash Prevention Slashes Police-Reported Rear-End Crashes. News, January 28, 2016. https://www.iihs.org/news/detail/front-crash-prevention-slashes-police-reported-rear-end-crashes.

IIHS. 2018. GM front crash prevention systems cut police-reported crashes, News, November 13, 2018. https://www.iihs.org/iihs/news/desktopnews/gm-front-crash-prevention-systems-cut-police-reported-crashes.

IIHS. 2019. Rear Crash Prevention Ratings. Vehicle Ratings. https://www.iihs.org/iihs/ratings/Rear-crash-prevention


## Unrestrained Occupants


American Academy of Pediatrics. 2018. AAP Updates Recommendations on Car Seats for Children. https://www.aap.org/en-us/about-the-aap/aap-press-room/Pages/AAP-Updates-Recommendations-on-Car-Seats-for-Children.aspx

Beard, Melissa M and Philip M. Salzberg. 2005. *The Last Five Percent: Who Are the Non-Users of Seat Belts in Washington State?* WTSC. Traffic Research & Data Center. December. http://wtsc.wa.gov/wp-content/uploads/2018/03/seatbelt_lastfivepercent1205.pdf

CDC. National Center for Injury Prevention and Control. 2019. Motor Vehicle Prioritizing Interventions and Cost Calculator for States (MV PICCS 3.0). Motor Vehicle Safety. Cost Data and Prevention Policies. https://www.cdc.gov/motorvehiclesafety/calculator/index.html.

National Highway Traffic Safety Administration (NHTSA). 2004. The National Initiative for Increasing Safety Belt Use. Sixth Report to Congress. Fourth Report to the President. Executive Order 13043. https://icsw.nhtsa.gov/people/injury/research/6thAnnualBUAReport/

Safe Kids Worldwide. n.d. Car Seat Safety Tips. https://www.safekids.org/car-seat.

Starnes, Marc. 2005. "Lives Saved Calculations for Infants and Toddlers." NHTSA Traffic Safety Facts: Research Note. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/809778.

WTSC. 2014. *Statewide Estimates of Child Restraint Use Among Elementary Students*. WTSC. http://wtsc.wa.gov/wp-content/uploads/dlm_uploads/2014/12/Statewide-Estimates-of-Child-Restraint-Use-Among-Elementary-Students_FINAL-1.pdf

## Young Drivers


Gershon, P., C. Zhu, S. G. Klauer, T. Dingus, and B. Simons-Morton. 2017. "Teens' Distracted Driving Behavior: Prevalence and Predictors." *Journal of Safety Research* 63 (December): 157–161. https://doi.org/10.1016/j.jsr.2017.10.002.

IIHS. Highway Loss Data Institute. n.d. GDL Crash Reduction Calculator. Accessed August 25, 2019. https://www.iihs.org/topics/teenagers/gdl-calculator.


## Pedestrians and Bicyclists


American Association of State Highway and Transportation Officials. Innovation Initiative. Pedestrian Gateway Treatment. http://aii.transportation.org/Pages/Pedestrian-Gateway-Treatment.aspx.

Casanova-Powell, Tara. 2019. "Speeding Away from Zero: Rethinking a Forgotten Traffic Safety Challenge." Spotlight on Highway Safety. Governors Highway Safety Association. https://www.ghsa.org/resources/Speeding19.

Cottrill, Caitlin D., and Thakuriah, Piyushimita. 2010. "Evaluating Pedestrian Crashes in Areas with High Low-Income or Minority Populations." *Accident Analysis and Prevention 42, no. 6: 1718-28.* https://doi.org/10.1016/j.aap.2010.04.012.

Blackburn, Lauren, Charles Zegeer, and Kristen Brookshire. "Field Guide for Selecting Countermeasures at Uncontrolled Pedestrian Crossing Locations." Report no. FHWA-SA-18-018. Federal Highway Administration Office of Safety. https://safety.fhwa.dot.gov/ped_bike/step/docs/pocket_version.pdf.

Fischer, Pam. 2016. "Everyone Walks: Understanding & Addressing Pedestrian Safety." Governors Highway Safety Association. https://www.ghsa.org/sites/default/files/2016-12/FINAL_sfped_0.pdf.

Gauvin, Lise, Lucie Richard, Cora Lynn Craig, Michaël Spivock, Mylène Riva, Mathieu Forster, et al. 2005. "From Walkability to Active Living Potential: An 'Ecometric' Validation Study." *American Journal of Preventive Medicine 28, no. 2: 126-133* https://doi.org/10.1016/j.amepre.2004.10.029.

Karner, A., D. Rowangould, and J. London. 2016. "We Can Get There From Here: New Perspectives on Transportation Equity." *UC Davis: National Center for Sustainable Transportation.* https://escholarship.org/uc/item/9zp565xr.

LaChapelle, Ugo. 2014. "Walk, Bicycle, and Transit Trips of Transit-Dependent and Choice Riders in the 2009 U.S. National Household Travel Survey" *Journal of Physical Activity & Health 12, no. 2 (August): 1139–1147.* https://www.ncbi.nlm.nih.gov/pubmed/25347916.

Pedestrian Safety Advisory Council. 2018. Annual Report NS Recommendations. WTSC. http://wtsc.wa.gov/wp-content/uploads/dlm_uploads/2019/01/FINAL-2018-PSAC-Annual-Report-.pdf.

Powell, L., S. Slater, and F. Chaloupka. 2004. "The relationship between community physical activity settings and race, ethnicity and socioeconomic status." *Evidence-Based Preventive Medicine 1: 135–144.* https://www.researchgate.net/publication/229042945.

Miller, Greg. 2016. "Newly Released Maps Show How Housing Discrimination Happened." National Geographic News. October 17, 2016. https://news.nationalgeographic.com/2016/10/housing-discrimination-redlining-maps/.

Morency, P., L. Gauvin, C. Plante, M. Fournier and C. Morency. 2012. "Neighborhood Social Inequalities in Road Traffic Injuries: The Influence of Traffic Volume and Road Design." *American Journal of Public Health, 102, no. 6 (June): 1112-1119.* https://ajph.aphapublications.org/doi/10.2105/AJPH.2011.300528.

Rothstein, Richard. 2017. *The Color of Law: A Forgotten History of How Our Government Segregated America. New York: Liveright Publishing.*

NTSB. 2017. *Reducing Speeding-Related Crashes Involving Passenger Vehicles. Safety Study. NTSB/SS-17/01. Washington, D.C.* https://www.ntsb.gov/safety/safety-studies/Documents/SS1701.pdf.

NTSB. 2018. Pedestrian Safety: Special Investigation Report. NTSB/SIR-18/03. Washington, D.C. https://www.ntsb.gov/safety/safety-studies/Documents/SIR1803.pdf.

Washington State Department of Health (DOH). Data and Statistical Reports. Health Data Visualization. Social Determinants of Health Dashboards. https://www.doh.wa.gov/DataandStatisticalReports/HealthDataVisualization/SocialDeterminantsofHealthDashboards.

WTSC. 2018. Cooper Jones Bicyclist Safety Advisory Council Annual Report. WTSC. http://wtsc.wa.gov/wp-content/uploads/dlm_uploads/2019/01/FINAL-2018-BSAC-Annual-Report.pdf.

Wilson, Dawn K., Karen A. Kirtland, Barbara E. Ainsworth, Cheryl L. Addy. 2004. "Socioeconomic Status and Perceptions of Access and Safety for Physical Activity." *Annals of Behavioral Medicine 28, no. 1 (August): 20–28.* https://doi.org/10.1207/s15324796abm2801_4.

## Motorcyclists

NO ADDITIONAL RESOURCES LISTED

## Older Drivers

Aksan, N., J. D. Dawson, J. L. Emerson, L. Yu, E. Y. Uc, S. W. Anderson, and M. Rizzo. 2013. "Naturalistic Distraction and Driving Safety In Older Drivers." *Human Factors* 55, no. 4 (August): 841-853. https://doi.org/10.1177/0018720812465769.

Chihui, S., T. Mielenz, C. DiMaggio, M. Betz, C. DiGuiseppi, V. Jones and G. Li. 2015, July. "Driving Cessation and Health Outcomes in Older Adults." *AAA Foundation for Traffic Safety*. https://aaafoundation.org/driving-cessation-health-outcomes-older-adults/.

Eby, David W., L. Molnar, L. Zhang, R. St. Louis, N. Zanier, and L. Kostyniuk, 2015. "Keeping Older Adults Driving Safely: A Research Synthesis of Advanced In-Vehicle Technologies." *AAA Foundation for Traffic Safety*. https://aaafoundation.org/keeping-older-adults-driving-safely-research-synthesis-advanced-vehicle-technologies/

Hill, Linda L., Guohua Li, David P. Merle, David W. Eby, Tara Kelley-Baker and Patricia Pepa. 2018. "Medication Use in Older Adult Drivers: AAA LongROAD Study." *AAA Foundation for Traffic Safety.* https://aaafoundation.org/medication-use-in-older-adult-drivers-findings-from-the-aaa-longroad-study/.

Thomas III, F. D., R. D. Blomberg, M. Knodler, and Matthew R.E. Romoser. 2013. *Licensing Procedures for Older Drivers.* Report No. DOT HS 811 833. Washington, DC: NHTSA. https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/811833.pdf.

Tortorello, Michael. 2017. "How Seniors Are Driving Safer, Driving Longer." *Consumer Reports*, June 01, 2017. https://www.consumerreports.org/elderly-driving/how-seniors-are-driving-safer-driving-longer/.

Tefft, Brian C. 2014. Driver License Renewal Policies and Fatal Crash Involvement Rates of Older Drivers, United States, 1986-2011. *Injury Epidemiology* 1 (October): 25. https://injepijournal.biomedcentral.com/articles/10.1186/s40621-014-0025-0.

## Heavy Trucks

NHTSA. 2019. Traffic Safety Facts: Large Trucks. DOT HS 812 663. https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812663.

## Emergency Medical Services and Trauma Care System


CDC. National Center for Injury Prevention and Control. Injury Coding and Data Systems. https://www.cdc.gov/injury/wisqars/dataandstats.html.

MacKenzie, EJ, Rivara FP, Jurkovich GJ, Nathens AB, Frey KP, Egleston BL, Salkever DS, Scharfstein DO. 2006. A National Evaluation of the Effect of Trauma-Center Care on Mortality. *New England Journal of Medicine 254(4):366-378.* https://doi.org/10.1056/NEJMsa052049.

Washington State DOH. Office of Community Health Systems. Washington State Trauma Registry Inclusion Criteria. https://www.doh.wa.gov/Portals/1/Documents/Pubs/530113.pdf.


## Cooperative Automated Transportation – Includes Automated Vehicles


American Association of Motor Vehicle Administrators. 2018. Jurisdictional Guidelines for the Safe Testing and Deployment of Highly Automated Vehicles. https://www.aamva.org/GuidelinesTestingDeploymentHAVs-May2018/.

American Automobile Association. 2019. "Three in Four Americans Remain Afraid of Fully Self-Driving Vehicles." AAA Newsroom. Mar. 14, 2019. https://newsroom.aaa.com/2019/03/americans-fear-self-driving-cars-survey/.

Governors Highway Safety Association. 2018. "Preparing for Automated Vehicles: Traffic Safety Issues for States." August 2018. https://www.ghsa.org/resources/AutomatedVehicles18.

IIHS Highway Loss Data Institute 2018. "On Foot, At Risk." *Status Report 53, no.3 (May).* https://www.iihs.org/api/datastoredocument/status-report/pdf/53/3.

National Council of State Legislature. 2019. Autonomous Vehicles: Self-Driving Vehicles Enacted Legislation. http://www.ncsl.org/research/transportation/autonomous-vehicles-self-driving-vehicles-enacted-legislation.aspx.

National Academies of Sciences, Engineering, and Medicine. 2018. *Implications of Connected and Automated Driving Systems. Vols. 1–6. Washington, DC: The National Academies Press.* https://doi.org/10.17226/25296.

NHTSA. 2017. Automated Driving Systems 2.0: A Vision for Safety. https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/13069a-ads2.0_090617_v9a_tag.pdf.

NHTSA. 2019. "Automated Vehicles for Safety: Overview." Technology & Innovation. https://www.nhtsa.gov/technology-innovation/automated-vehicles-safety.

National Operations Center of Excellence. Cooperative Automated Transportation (CAT) Coalition. https://transportationops.org/CATCoalition.

National Safety Council. MyCarDoesWhat Campaign. https://mycardoeswhat.org.

Partners for Automated Vehicle Education. https://pavecampaign.org.

Uniform Law Commission. Automated Operation of Vehicles Act Committee. https://www.uniformlaws.org/committees/community-home?communitykey=43730d6f-013d-4883-b2b7-98e66bda3239&tab=groupdetails.

U.S. Department of Transportation. 2018. Preparing for the Future of Transportation: Automated Vehicles 3.0. https://www.transportation.gov/sites/dot.gov/files/docs/policy-initiatives/automated-vehicles/320711/preparing-future-transportation-automated-vehicle-30.pdf.

Washington State Department of Licensing (DOL). n.d. "Autonomous vehicles: Self-certification for testing in Washington State." Accessed August 25, 2019. https://www.dol.wa.gov/vehicleregistration/autonomous-self-cert.html.

WSDOT. Cooperative Automated Transportation (CAT). http://www.wsdot.wa.gov/travel/automated-connected/home.

Washington State Office of the Governor. 2017. Autonomous Vehicle Testing & Technology in Washington State and Autonomous Vehicle Work Group. Executive Order 17-02. June 7, 2017. http://governor.wa.gov/sites/default/files/exe_order/17-02AutonomouVehicles.pdf

WSTC. Autonomous Vehicle Work Group: Subcommittees. http://wstc.wa.gov/Meetings/AVAgenda/AutonomousVehicleWorkGroup.html.

Zmud, Johanna. 2019. "What the Public Really Thinks about Automated Vehicles: Evidence from Survey Research." Presented at the Automated Vehicle Symposium, July 16, 2019, Orlando, FL. https://s36.a2zinc.net/clients/auvsi/avs2019/Custom/Handout/Speaker0_Session3404_1.pdf.

## Safe Systems Approach

Campbell, Anthony, and Cara Robinson. 2018. "Dying While Walking: Interrogating Media Coverage of Pedestrian Deaths in the United States." Presented at the Urban Affairs Association Conference, April 2018. Toronto, Ontario, Canada. http://mediad.publicbroadcasting.net/p/wpln/files/dying_while_walking_wbn_presentation_final.pdf.

Casanova-Powell, Tara. 2019. "Speeding Away from Zero: Rethinking a Forgotten Traffic Safety Challenge." Spotlight on Highway Safety. Governors Highway Safety Association. https://www.ghsa.org/resources/Speeding19.

CDC. 2015. "The National Institute for Occupational Safety and Health Hierarchy of Controls." Workplace Safety & Health Topics. https://www.cdc.gov/niosh/topics/hierarchy/default.html.

Cottrill, Caitlin D., and Piyushimita Thakuriah. 2010. "Evaluating Pedestrian Crashes in Areas with High Low-Income or Minority Populations." *Accident Analysis and Prevention 42, no. 6 (November): 1718-28.* https://doi.org/10.1016/j.aap.2010.04.012.

Fischer, Pam. 2016. "Everyone Walks: Understanding & Addressing Pedestrian Safety." Governors Highway Safety Association. https://www.ghsa.org/sites/default/files/2016-12/FINAL_sfped_0.pdf.

Gauvin, Lise, Lucie Richard, Cora Lynn Craig, Michaël Spivock, Mylène Riva, Mathieu Forster, et al. 2005. "From Walkability to Active Living Potential: An 'Ecometric' Validation Study." *American Journal of Preventive Medicine 28, no. 2: 126-133* https://doi.org/10.1016/j.amepre.2004.10.029.

IIHS Highway Loss Data Institute. 2018. "On Foot, At Risk." *Status Report 53, no.3 (May 8, 2018).* https://www.iihs.org/api/datastoredocument/status-report/pdf/53/3.

Jacobsen, P. L. 2003. "Safety in Numbers: More Walkers and Bicyclists, Safer Walking and Bicycling." *Injury Prevention 9, no. 3 (April 1, 2003): 205-209.* https://injuryprevention.bmj.com/content/injuryprev/9/3/205.full.pdf.

Karner, A., D. Rowangould, and J. London. 2016. "We Can Get There From Here: New Perspectives on Transportation Equity." *UC Davis: National Center for Sustainable Transportation.* https://escholarship.org/uc/item/9zp565xr.

Kraemer, J. D., and Connor S. Benton. 2015. "Disparities in Road Crash Mortality Among Pedestrians Using Wheelchairs in the USA: Results of a Capture-Recapture Analysis." *BMJ Open 5, no. 11 (November).* https://doi.org/10.1136/bmjopen-2015-008396.

LaChapelle, Ugo. 2014. "Walk, Bicycle, and Transit Trips of Transit-Dependent and Choice Riders in the 2009 U.S. National Household Travel Survey" *Journal of Physical Activity & Health 12, no. 2 (August): 1139–1147.* https://www.ncbi.nlm.nih.gov/pubmed/25347916.

Lawrence, Eric D., Nathan Bomey and Kristi Tanner. 2018. "Death on Foot: America's Love of SUVs Is Killing Pedestrians. *Detroit Free Press, July 1, 2018.* https://www.freep.com/story/money/cars/2018/06/28/suvs-killing-americas-pedestrians/646139002/.

Magusin, Heather. 2017. "If You Want to Get Away with Murder, Use Your Car: A Discursive Content Analysis of Pedestrian Traffic Fatalities in News Headlines." *Earth Common Journal 7, no. 1 (October 2017).* https://journals.macewan.ca/earthcommon/article/view/1229/1026.

Miller, Greg. 2016. "Newly Released Maps Show How Housing Discrimination Happened." *National Geographic News, October 17, 2016.* https://news.nationalgeographic.com/2016/10/housing-discrimination-redlining-maps/.

Morency, P., L. Gauvin, C. Plante, M. Fournier and C. Morency. 2012. "Neighborhood Social Inequalities in Road Traffic Injuries: The Influence of Traffic Volume and Road Design." *American Journal of Public Health, 102, no. 6 (June): 1112-1119.* https://ajph.aphapublications.org/doi/10.2105/AJPH.2011.300528.

NTSB (National Transportation Safety Board). 2018. *Pedestrian Safety. Special Investigation Report. NTSB/SIR-18/03. Washington, D.C.* https://www.ntsb.gov/safety/safety-studies/Documents/SIR1803.pdf.

NTSB. 2017. *Reducing Speeding-Related Crashes Involving Passenger Vehicles. Safety Study. NTSB/SS-17/01. Washington, D.C.* https://www.ntsb.gov/safety/safety-studies/Documents/SS1701.pdf.

Powell, L., S. Slater, and F. Chaloupka. 2004. "The relationship between community physical activity settings and race, ethnicity and socioeconomic status." *Evidence-Based Preventive Medicine 1: 135–144.* https://www.researchgate.net/publication/229042945.

Ralph, Kelcie, Evan Iacobucci, Calvin G. Thigpen, and Tara Goddard. 2019. "Editorial Patterns in Bicyclist and Pedestrian Crash Reporting." *Transportation Research Record: Journal of the Transportation Research Board 2673, no. 2 (February 1, 2019): 663-671.* https://doi.org/10.1177/0361198119825637.

Richard, C. M., K. Magee, P. Bacon-Abdelmoteleb, and J. L. Brown. 2018. *Countermeasures that Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices, Ninth Edition (Report no. DOT HS 812 478). Washington, DC: National Highway Traffic Safety Administration.* https://www.nhtsa.gov/sites/nhtsa.dot.gov/files/documents/812478_countermeasures-that-work-a-highway-safety-countermeasures-guide-.pdf

Rothstein, Richard. 2017. *The Color of Law: A Forgotten History of How Our Government Segregated America. New York: Liveright Publishing.*

Traveling Via Public Transportation in North America. n.d. *"Why Travel Via Public Transportation." Accessed August 25, 2019.* https://www.pubtrantravel.com/whyuse.html#safety.

Vanterpool, Veronica. 2018. "Webinar recap: Safety & Systems for Vision Zero–Putting Theory Into Practice." Vision Zero Network, December 21, 2018. https://visionzeronetwork.org/webinar-recap-safety-systems-for-vision-zero-putting-theory-into-practice/.

WSDOT. 2016. *Washington State Public Plan.* https://www.wsdot.wa.gov/sites/default/files/2015/09/30/PT-Report-WashingtonStatePublicTransportationPlan-2016.pdf.

Washington State DOH. n.d. Social Determinants of Health Dashboards. Data and Statistical Reports. Health Data Visualization. Accessed August 25, 2019. https://www.doh.wa.gov/DataandStatisticalReports/HealthDataVisualization/SocialDeterminantsofHealthDashboards.

Washington State DOH. "Population with a Disability." Washington Tracking Network (WTN). https://fortress.wa.gov/doh/wtn/WTNPortal/#!q0=3556.

Wilson, Dawn K., Karen A. Kirtland, Barbara E. Ainsworth, Cheryl L. Addy. 2004. "Socioeconomic Status and Perceptions of Access and Safety for Physical Activity." *Annals of Behavioral Medicine 28, no. 1 (August): 20–28.* https://doi.org/10.1207/s15324796abm2801_4.

## Legislation and Policy

WTSC. 2018. Report. http://wtsc.wa.gov/wp-content/uploads/dlm_uploads/2019/01/2018-DD-REPORT.pdf.

## Licensing and Regulation

Curry, Allison E. 2017. "Is Graduated Driver Licensing Appropriate for Older Novice Drivers?" Center for Injury Research and Prevention (CIRP), Children's Hospital of Philadelphia (CHOP) Research Institute, September 2017. https://injury.research.chop.edu/blog/posts/graduated-driver-licensing-appropriate-older-novice-drivers#.Wplwe_67oWo.

Curry, Allison E., Robert D. Foss, and Allan F. Williams. 2017. "Graduated Driver Licensing for Older Novice Drivers: Critical Analysis of the Issues." *American Journal of Preventive Medicine 53, no. 6 (December 2017): 923–927.* https://doi.org/10.1016/j.amepre.2017.06.014.

Mayhew, Dan, Allan Williams, and Charlotte Pashley. 2014. *A New GDL Framework: Evidence Base to Integrate Novice Driver Strategies. Traffic Injury Research Foundation Ottawa, Ontario: Traffic Injury Research Foundation.* http://tirf.ca/wp-content/uploads/2017/01/ANewGDL-Framework_EvidenceBasetoIntegrateNoviceDriverStrategies_6.pdf.

Tefft, B. C., A. F. Williams, and J. G. Grabowski. 2013. "Timing of Driver's License Acquisition and Reasons for Delay among Young People in the United States, 2012." AAA Foundation for Traffic Safety. August 2013. https://aaafoundation.org/timing-drivers-license-acquisition-reasons-delay-among-young-people-united-states-2012/.

Traffic Injury Research Foundation. n.d. GDL Framework Safety Center. Accessed August 25, 2019 http://gdlframework.tirf.ca/.

Washington State DOL. https://www.dol.wa.gov/.

## Transportation and Health Equity

Brennan Ramirez, L. K., E. A. Baker, and M. Metzler. 2008. *Promoting Health Equity: A Resource to Help Communities Address Social Determinants of Health. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.* https://www.cdc.gov/nccdphp/dch/programs/healthycommunitiesprogram/tools/pdf/SDOH-workbook.pdf

Governing. n.d. "Pedestrian Deaths in Poorer Neighborhoods Report." *Governing*. Accessed August 25, 2019. http://www.governing.com/gov-data/pedestrian-deaths-poor-neighborhoods-report.html

Lane, Leigh Blackmon, Ann Steedly, Teresa Townsend, Brandy Huston, and Chris Danley. 2019. *Connecting Transportation and Health: A Guide to Communication and Collaboration. National Cooperative Highway Research Program Project 25-25, Task 105.* https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4101

Nodjimbadem, Katie. 2017. "The Racial Segregation of American Cities Was Anything but Accidental." smithsonian.com. May 30, 2017. https://www.smithsonianmag.com/history/how-federal-government-intentionally-racially-segregated-american-cities-180963494/#LRzlI0xlddgEYFzo.99.

Rothstein, Richard. 2017. *The Color of Law: A Forgotten History of How Our Government Segregated America. New York: Liveright Publishing.*

World Health Organization. *n.d. Social Determinants of Health: Key Concepts. Accessed August 25, 2019.* https://www.who.int/social_determinants/thecommission/finalreport/key_concepts/en/.

WSDOT. 2018. "Active Transportation: Annual Safety Report." *Gray Notebook 69 (March): 16.* http://wsdot.wa.gov/publications/fulltext/graynotebook/gray-notebook-Mar18.pdf#page=12.

Washington State DOH. n.d. Data and Statistical Reports. Environmental Health, Washington Tracking Network (WTN). Accessed August 25, 2019. https://fortress.wa.gov/doh/wtn/WTNIBL/

Palouse Regional Transportation Planning Organization (RTPO). Palouse Driver Safety Campaign. www.safepalousedrivers.com.

Vision Zero. https://visionzeronetwork.org/resources/vision-zero-cities.

WSDOT. n.d. What is an MPO. Accessed August 25, 2019. https://www.wsdot.wa.gov/planning/Metro/Default.htm.

WSDOT. n.d. Regional Transportation Planning: What is an RTPO? Accessed Aug. 25, 2019. https://www.wsdot.wa.gov/planning/Regional/Default.htm.

Washington State Office of Financial Management. 2018. "Fastest Growing Counties in Washington State." 2018 Population Trends. Population Trends Forecasting & Research Division. July 2018. https://www.ofm.wa.gov/sites/default/files/public/dataresearch/pop/april1/ofm_april1_poptrends.pdf.

The World Day of Remembrance for Road Traffic Victims. n.d. Accessed August 25, 2019. https://worlddayofremembrance.org/.

THIS PAGE INTENTIONALLY LEFT BLANK

# Appendix M: Special Thanks

## Project Co-Sponsors:

- John Milton, State Safety Engineer, Washington State Department of Transportation (WSDOT)
- John Nisbet, Director of Traffic Operations, WSDOT
- Pam Pannkuk, Deputy Director, Washington Traffic Safety Commission (WTSC)

## Data Analyst Group:

- Matthew Enders (Co-Lead), WSDOT
- Staci Hoff (Co-Lead), WTSC
- Mike Bernard, WSDOT
- Daniel Cooke, Washington State Department of Licensing (DOL)
- Dick Doane, WTSC
- Zeyno Nixon, Health Care Authority (HCA)
- Alison Radford, DOL
- Joanna Trebaczewski, Washington State Patrol (WSP)

## With additional contributions by:

- Ben Booth, Department of Health (DOH)
- Joe Campo, Office of Financial Management (OFM)
- Natasha Close, DOH
- Julie Jackson, WSDOT
- Amanda Morse, DOH

## Project Team Members:

- Wade Alonzo, WTSC
- Keri Cleary, Swinomish Indian Tribe
- Mike Dornfeld, WSDOT
- Matthew Enders, WSDOT
- Edica Esqueda, WTSC
- Will Hitchcock, DOH
- Staci Hoff, WTSC
- Bruce Maier, WSP
- Erika Mascorro, WTSC
- Mark Medalen, WTSC
- Dave Putnam, WSP
- Nadine Selene-Hait, WTSC
- Angie Ward, WTSC
- Karen Wigen, Spokane County
- Haiping Zhang, DOL

## Past Members:

- Marc Anderson, King County Metro
- Aimiee D'Avignon, DOH
- Hollyanna Littlebull, Confederated Tribes and Bands of the Yakama Nation
- Dory Nicpon, DOL
- Rob Sharpe, WSP
- Blake Trask, Cascade Bicycling Club

## Steering Committee Members:

- Wade Alonzo, WTSC
- Logan Bahr, Association of Washington Cities (AWC)
- Shaun Darveshi, Palouse Regional Transportation Planning Organization (RTPO)
- Marshall Elizer, WSDOT
- Patti Enbody, Office of the Superintendent of Public Instruction (OSPI)
- Julie Knittle, Americn Association of Motor Vehicle Administrators (AAMVA)
- Matt Kunic, Federal Highways Administration (FHWA)
- Dezarae Hayes, Muckleshoot Indian Tribe
- Sarah Mariani, HCA
- Dirk Marler, Administrative Office of the Courts (AOC)
- Meghann McCann, DOL
- Captain Chris Olds, WSP Field Operations Bureau
- Paula Reeves, DOH
- Jon Snyder, Governor's Office
- Jane Wall, Washington State Association of County Engineers (WSACE)
- Bob Wilson, Whatcom Council of Governments

## Past Members:

- Captain Jim Coley, WSP
- Shannon McClelland, AWC
- Don Peterson, FHWA (retired)
- Billy Reamer, HCA

## Communications Team:

- Logan Bahr, AWC
- Shelly Baldwin, WTSC
- Amy Blondin, HCA
- Barb Chamberlain, WSDOT
- Megan Cotton, WSDOT Tribal and Federal Relations
- Shaun Darveshi, Palouse RTPO
- Stephanie Davidsmeyer, Liquor and Cannabis Board (LCB)
- Patti Enbody, OSPI
- Wendy Ferrell, AOC
- Will Hitchcock, DOH
- Mark Horner, DOL
- Annie Kirk, Public Health Seattle/King County
- Barbara LaBoe, WSDOT
- Erika Mascorro, WTSC
- Lt. Dave Putnam, WSP
- Erica Stineman, WTSC
- Lt. Mark Tigard, WSP
- Jane Wall, WSACE
- Angie Ward, WTSC

## Advisors:

- Mari Hembeck, National Highway Traffic Safety Administration
- Jeffrey James, US Department of Transportation
- Rob Snaza, Washington Association of Sheriffs and Police Chiefs (WASPC)
- Mike Southards, Washington Trucking
- Max Sevareid, National Highway Traffic Safety Administration

## Chapter Writers:

- Ted Bailey, WSDOT
- Debi Besser, WTSC
- Daniela Bremmer, WSDOT
- Debbie Carter, WSP
- Charlotte Claybrooke, WSDOT
- Dan Cooke, DOL
- Megan Cotton, WSDOT
- Trevor Daviscourt, WSDOT
- Dick Doane, WTSC
- Dolly Fernandes, DOH
- Myke Gable, WTSC
- Jacob Hursey, WSP
- Jerry Noviello, WTSC
- Alison Radford, DOL
- Mark Tegard, WSP
- Cesi Velez, Bonney Lake Police Department
- Scott Waller, WTSC
- Brian Wood, WSDOT
- Kevin Zeller, WSP

## Additional Key Contributors:

- All Program Managers and Staff of the WTSC
- The Washington Impaired Driving Council (WIDAC)
- All partners who attended the December 2018 Target Zero Partner Meeting