Priority Level Three

Washington State 2009-2011	Fatalities # of People	Fatalities % of Total	Serious Injuries # of People	Serious Injuries % of Total
Priority Level Three				
Older Driver 75+ Involved	126	9.0%	378	5.2%
Heavy Truck Involved	115	8.2%	341	4.7%
Drowsy Driver Involved	45	3.2%	258	3.6%
Bicyclists	26	1.8%	339	4.7%
Work Zone	9	0.6%	132	1.8%
Wildlife	8	0.6%	78	1.1%
School Bus Involved	3	0.2%	18	0.2%
Vehicle-Train	2	0.6%	3	0.0%
Total*	**1,406**		**7,247**	

** "Total" is for all fatalities and serious injuries in Levels One, Two and Three combined. More than one factor is commonly involved in fatal and serious injury collisions. Therefore, each fatality and serious injury in "Total" may be represented multiple times in the Level tables. For the Target Zero Priorities Chart with all three priority levels, see page 9.*

Older Drivers 75+ Involved

Executive Summary

Between 2009-2011, older road users were involved in 9% (126) of all traffic fatalities. By 2040, people in Washington 75 or older will comprise 11.7% of our state's population, compared to 5.5% in 2010. We will continue to monitor data pertaining to older drivers and develop strategies to plan for an aging population with the goal of enabling older drivers to retain as much mobility as possible for as long as possible.

By 2040, over one million people in Washington will be 75 or older – almost three times the number of people in that age group today.

Background

The number of older road users is increasing as the baby boomer population ages. This group of 75 and older Washington citizens will number over a million by 2040, making up 11.7% of our state's population. Although age itself does not determine driving capabilities, older drivers can experience declines in their sensory, cognitive or physical functioning, increasing their risk of involvement in traffic collisions.

From 2009-2011, older road users were involved in 126 (9%) traffic fatalities. This is an 8% decrease when compared with 2006-2008 numbers. On the other hand, serious injuries involving drivers 75 and older increased by 1.3%. To achieve Target Zero for older driver involved collisions, there will need to be two fewer fatalities and six fewer serious injuries each year until 2030.

Contributing Circumstances and Factors

Among older drivers age 75 and older involved in fatal collisions, 27.8% had no driver related factors. In serious injury collisions, 38.9% of older drivers involved had no driver related factors. When older driver actions did contribute to the collision, failure to grant right-of-way was the most common driver related factor, contributing to 15.9% of fatalities and 26.4% of serious injuries.

In fatal collisions, 9.5% of older drivers were distracted and 5.2% were distracted in serious injury collisions.

Older drivers are more vulnerable than younger drivers in collisions. The skeletal structures of older persons are more easily damaged and the consequences of a collision are likely to be more serious. From 2009-2011,

among all persons involved in fatal and serious injury collisions, persons age 75 and older were the highest risk age group for death or injury. In fatal collisions, almost half (47.7%) of persons age 75 and older involved were the ones killed, compared to the next highest age group of 45-54 at 10.8%.

Similarly in serious injury collisions, 65% of persons age 75 and older involved were the ones seriously injured, compared to only 6.4% of persons age 18-24, 25-34 and 55-64. Compared to involved persons age 65-74, persons aged 75 and older are 7.5 times more likely to be killed and over 20 times more likely to be seriously injured when involved in these collisions.

Programs and Successes

Highway Design and Traffic Control Elements

Among other things, the Washington State Department of Transportation (WSDOT) has been using enlarged road signs and improved nighttime reflectivity to increase readability. The WSDOT design manual also promotes intersections that meet at 90 degrees, in part to improve safety for older drivers.

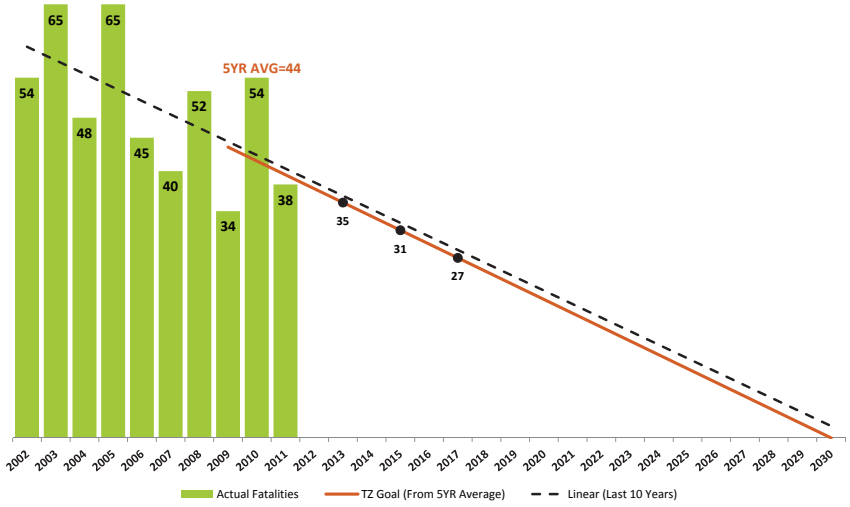
Education

Older drivers may enroll in educational classes through programs such as AAA's "Senior Defensive Driving Program." These programs focus on high-risk situations all drivers face, as well as providing tips and techniques for addressing factors more typical with age. These include changing vision, reduced response times, and effects of various prescription medications.

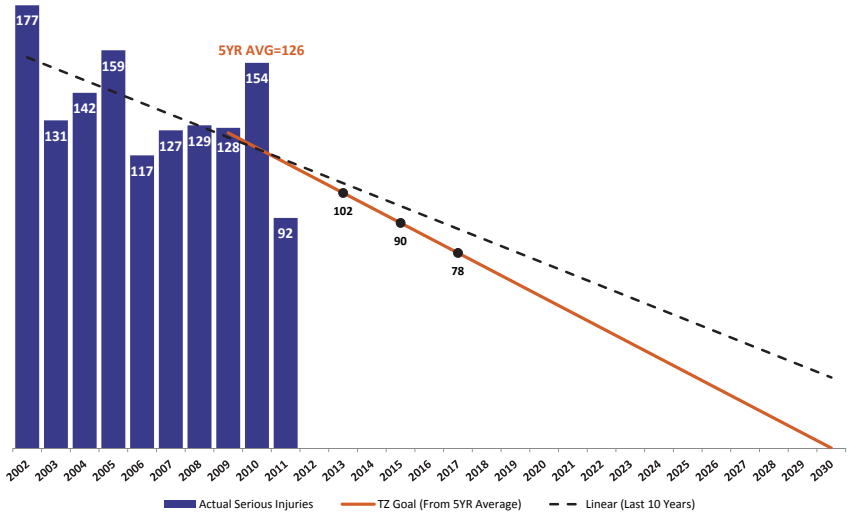
Guidelines for Aging Population

Older drivers who can no longer drive safely in some situations may need to have their driver license restricted or revoked. It may be helpful to establish a State Medical Advisory Board to develop guidelines to determine medical conditions, regardless of age, when driver license restrictions or revocation might be needed.

Older Drivers 75+ Involved Fatalities 2002-2011



Older Drivers 75+ Involved Serious Injuries 2002-2011



Objectives & Strategies		
Objectives (What)	**Strategies (How)**	**Implementation Arena(s)**
1. Identify older drivers at an elevated crash risk.	1.1 Implement additional procedures for screening drivers' abilities and skills. (P, CTW)	Leadership/Policy
	1.2 Provide training to law enforcement, medical professionals, and community members for recognizing physical and cognitive deficiencies affecting safe driving in older drivers, including submitting reevaluation referrals to Department of Licensing. (P, CTW)	Enforcement, Leadership/ Policy, Education
	1.3 Implement Model Driver Screening and Evaluation Program Guidelines for Motor Vehicle Administrators for screening and evaluating older drivers' physical and cognitive abilities and skills. (P, CTW)	Leadership/Policy, Education
	1.4 Continue to restrict drivers license online eligibility and renewals for drivers age 70+	Leadership/Policy
2. Improve older driver competency	2.1 Increase driver education opportunities for older drivers. (U)	Education
3. Reduce risk of serious injury and fatalities involving older drivers	3.1 Provide incentives for older drivers who use alternative modes of transportation. (R, FTA)	Education, Leadership/ Policy
	3.2 Involve caregivers and family members of older drivers in discussions and education about aging and driving and provide techniques they can use to help the older driver assess safe driving, and, when necessary, transition from driving. (R, NHTSA)	Education
	3.3 Reduce the amount of information on road signs, making them easier to read. (U)	Engineering

P = Proven **R = Recommended** **U = Unknown**

CTW = Countermeasures That Work
FTA = Federal Transit Administration
NHTSA = National Highway Traffic Safety Administration

Additional Resources

Attracting Senior Drivers to Public Transportation: Issues and Concerns (Federal Transit Administration), http://www.fta.dot.gov/documents/TRANSPO_Attracting_Seniors_Public_Transportation_Final_Report.pdf

Characteristics of Crash Injuries Among Young, Middle-aged, and Older Drivers (National Highway Traffic Safety Administration, 2007), http://www-nrd.nhtsa.dot.gov/Pubs/810857.pdf

Countermeasures That Work: *A Highway Safety Countermeasure Guide for State Highway Safety Offices, 7th Edition,* Chapter 7 (National Highway Traffic Safety Administration), http://www.nhtsa.gov/staticfiles/nti/pdf/811727.pdf

Driving Transitions Education: Tools, Scripts, and Practice Exercises (National Highway Traffic Safety Administration), http://www.nhtsa.gov/DOT/NHTSA/Traffic%20Injury%20Control/Articles/Associated%20Files/811152.pdf

Forecast of the State Population: November 2012 Forecast (Washington Office of Financial Management), http://www.ofm.wa.gov/pop/stfc/stfc2012/stfc_2012.pdf

NCHRP Report 500, Volume 9: A Guide for Reducing Collisions Involving Older Drivers (National Cooperative Highway Research Program, Transportation Research Board), http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_500v9.pdf

Heavy Truck Involved

Fatalities involving a heavy truck decreased 49% over three years.

Executive Summary

In 2009-2011, heavy truck involved fatalities decreased by 49% (227 to 115) and serious injuries by 26% (461 to 341) compared to 2006-2008. Several heavy truck enforcement campaigns, often paired with educational efforts, have contributed to this impressive decline, which also preserves our state's road infrastructure.

Background

In 2009-2011, heavy trucks were involved in 115 (8.2%) of Washington's traffic fatalities and 341 (4.7%) of the serious injuries. This is a significant decrease of 49% for fatalities and 26% for serious injuries compared with 2006-2008. Collisions involving heavy trucks (over 10,000 gross vehicle weight rate) pose higher risk of death and serious injury, particularly for other involved drivers, mainly due to their size and weight.

For this edition of Target Zero, the data definition was revised to be more inclusive of all types of commercial motor vehicles in addition to heavy trucks. The heavy truck numbers now also include any commercial vehicle classification for vehicles reported through a commercial vehicle supplement to the Police Traffic Collision Report (PTCR).

The critical and timely data used during roadside inspections was enhanced with the implementation of the Federal Motor Carrier Safety Administration's (FMCSA) Compliance Safety Analysis project. This process improvement project provides officers with the ability to inspect a greater number of high-risk carriers and drivers while facilitating greater communication with the industry. The new enforcement and compliance model allows FMCSA and its state partners to address more safety problems before crashes occur. Rolled out in December 2010, the program establishes a new nationwide system for making the roads safer for motor carriers and the public alike.

Contributing Circumstances and Factors

From 2009-2011, over 70% of heavy truck involved collisions occur where posted speeds are 50 mph or greater. Nearly 75% of these collisions occurred on state routes. Less than 5% of heavy truck operators involved in fatal collisions were impaired by drugs and less than 1% impaired by alcohol. Approximately 8% of heavy truck operators were speeding, compared to 12% of other drivers involved in fatal collisions with heavy trucks. Less than 2% of heavy truck operators involved in fatal collisions were drowsy, however nearly 20% were distracted (see pages 67-74). There were no improperly endorsed or unlicensed heavy truck operators involved in fatal collisions.

Programs and Successes

Commercial Vehicle Enforcement Bureau Inspections

The Commercial Vehicle Enforcement Bureau (CVEB) is recognized as a national leader in implementing technology to reduce commercial motor vehicle (CMV) collisions, as well as support freight mobility. In 2012, Washington enforcement officers inspected 107,823 vehicles, an increase of 5,384 inspections compared to 2011. This was 49% higher than the national average of 72,018 inspections per state. CVEB utilizes data to identify high-risk carriers at roadside and fixed facilities and prioritizes compliance reviews. The data is also used to support resource deployment, identify enforcement corridors, and plan emphasis activities and strategies targeted at reducing CMV collisions.

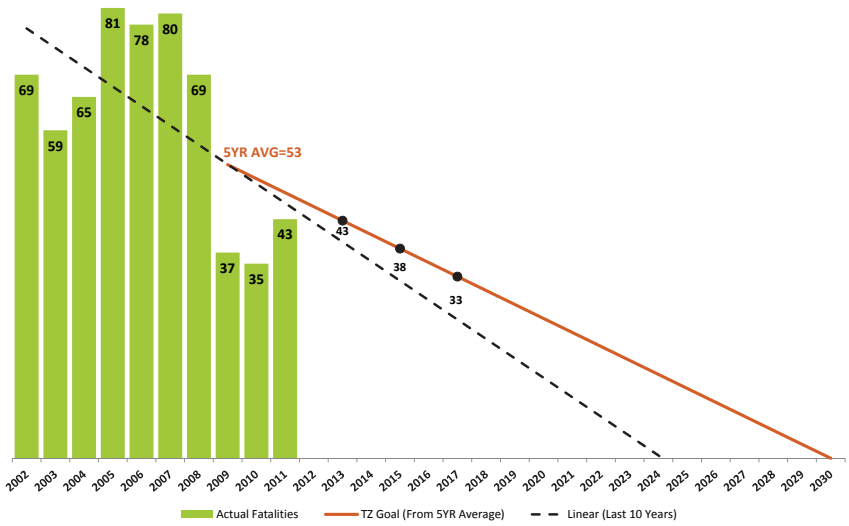
Heavy Truck Definition:

1) Any vehicle that also has a vehicle classification of trailer with GVWR of 10,001 lbs. or more, single vehicle with GVWR of 26,001 lbs. or more, or single vehicle of 26,000 lbs. or less-CDL required or a commercial vehicle supplement to the collision report.

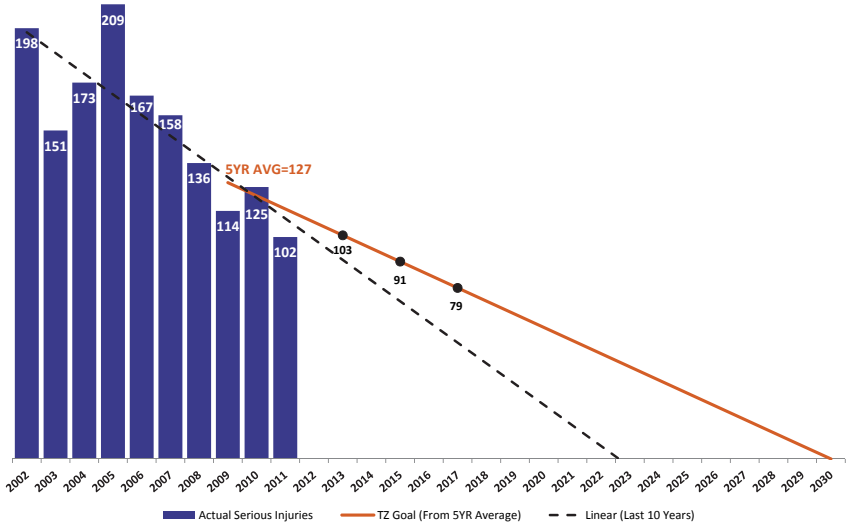
2) A vehicle type of Truck and Trailer, Truck Tractor, Truck Tractor and Semi-Trailer, or Truck-Double Trailer Combinations.

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.

Heavy Truck Involved Fatalities 2002-2011



Heavy Truck Involved Serious Injuries 2002-2011



Fatigue Driving Problem Oriented Public Safety Project

Drowsiness makes drivers less attentive, slows reaction time, and affects a driver's ability to make decisions. Cognitive impairment after approximately 18 hours awake is similar to that of someone with a blood alcohol content (BAC) of 0.05%. After about 24 hours awake, impairment is equivalent to a BAC of 0.10%, higher than the legal limit in all states (http://www.cdc.gov/features/dsdrowsydriving/).

The Washington State Patrol (WSP), in partnership with Oregon Department of Transportation, initiated a Problem Oriented Public Safety (POPS) project to combat fatigued commercial drivers and reduce related collisions and incidents. The POPS project was part of the WSP's efforts to reduce CMV collisions and fatalities.

During the year-long project (December 2011 – December 2012) the two-state alliance inspected 1,846 commercial vehicles. Washington and Oregon shared information by using new technology from Washington's Automated License Plate Readers (ALPR). The ALPR helped officers in both states map the location of CMV in relation to time. Throughout the POPS emphasis, all fixed scales on Interstate 5 from southern Oregon to the Canadian Border remained open 24 hours a day.

The information exchange between the states proved to be an extremely valuable tool for inspectors in detecting and confirming hours of service violations. Inspectors targeted fatigued drivers through close examination of drivers' logbooks. A total of 366 drivers found to be operating in excess of allowable hours of service, or in possession of falsified logbooks, were placed out of service for an average of 10 hours. Top offenses were: false reporting of driver's duty status; driving over the 11/14 60/70 hour rule, logbook not current, and disqualified driver.

Ticket Aggressive Cars and Trucks Program

The Ticket Aggressive Cars and Trucks (TACT) program is working to reduce CMV-related collisions, injuries and fatalities, through education and enforcement related to car and truck drivers sharing the road safely. The program was created in 2002 under the leadership and funding of the Washington Traffic Safety Commission (WTSC), working in cooperation with nearly a dozen public and private organizations statewide. The successful program has now been implemented nationwide. In 2012, the nine assigned Washington State Patrol (WSP) CVD TACT officers located around the state contacted 10,827 violators, 2,496 aggressive drivers, 6,238 speed violators, 363 seatbelt violators, seven reckless drivers, 38 negligent drivers, and completed 1,280 CVSA inspections. The officers also made 20 drug arrests and four DUI arrests.

In addition to the TACT program, WSP participates in other national public awareness and enforcement campaigns targeting commercial vehicles, such as Operation Safe Driver, Roadcheck and Operation Air Brake/Brake Safety Week.

Weight Limits on Heavy Trucks

In 1975, federal laws were implemented to provide protection and uniformity to the existing and future national highway infrastructure. Having these defined limits helps engineers to design pavements that will hold up under anticipated truck volumes. The Washington State Department of Transportation continuously monitors our state's highways and bridges for signs of repeated overweight loads or volume in excess of what was anticipated at the engineering design phases.

Objectives & Strategies		
Objectives (What)	**Strategies (How)**	**Implementation Arena(s)**
1. Increase safety and reduce collisions through quality driver and vehicle inspections and enforcement	1.1 Increase and strengthen commercial vehicle safety and performance inspections, including focus on the heavy truck/ commercial vehicle driver. (P, NCHRP)	Enforcement
	1.2 Promote industry safety initiatives by performing safety consultations with carrier safety management. (P, NCHRP)	Education
	1.3 Provide ongoing education and outreach utilizing 'Share the Road' information. (R, NCHRP)	Education
	1.4 Establish commercial vehicle compliance checkpoints in areas identified as high risk for collisions involving heavy trucks/ commercial vehicles. (R, DDACTS)	Enforcement
	1.5 Increase commercial vehicle enforcement contacts targeting the top five collision-causing moving violations. (R, DDACTS)	Enforcement
	1.6 Increase enforcement personnel use of FMCSA's PORTAL for identifying high-risk carriers. (U)	Enforcement
	1.7 Provide CMV training to enforcement officers at the state, county, and local levels. (U)	Enforcement, Education
2. Improve roadway infrastructure to reduce heavy truck/ commercial vehicle collisions	2.1 Install interactive truck rollover and curve warning signage. (P, NCHRP)	Engineering
	2.2 Incorporate rumble strips into new and existing roadways to reduce fatigue-related collisions. (R, CMF)	Engineering

P = Proven **R = Recommended** **U = Unknown**

CMF = Crash Modification Factors
DDACTS = Data Driven Approaches to Crime and Traffic Safety
NCHRP = National Cooperative Highway Research Program

Additional strategies applicable to reducing Heavy Truck involved fatalities and serious injuries can be found in the Distracted Driver Involved section, pages 73-74.

Additional Resources

Countermeasures That Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices, 7th Edition, (National Highway Traffic Safety Administration), http://www.nhtsa.gov/staticfiles/nti/pdf/811727.pdf

NCHRP Report 500, Volume 13: A Guide for Reducing Collisions Involving Heavy Trucks, (National Cooperative Highway Research Program, Transportation Research Board), http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_500v13.pdf

Drowsy Driver Involved

Executive Summary

Between 2009-2011, statistics showed drowsy drivers contributed to 45 traffic fatalities and 258 serious injuries in Washington State. However, this contributing factor may be significantly higher because it's difficult to prove if or when a driver is drowsy. It requires self- or witness reporting, which is often inconsistent. Education and engineering efforts are the most effective ways to keep drivers awake and alert.

Background

All drivers have experienced the feeling of being drowsy at one time or another. Drowsy driving can result from such things as lack of sleep, too much time on the road without stopping, taking over-the-counter or prescription medications, or consuming drugs or alcohol.

Drowsiness makes drivers less attentive, slows reaction time and affects a driver's ability to make decisions. Cognitive impairment after approximately 18 hours awake is similar to that of someone with a blood alcohol content (BAC) of 0.05%. After about 24 hours awake, impairment is equivalent to a BAC of 0.10%, higher than the legal limit in all states (http://www.cdc.gov/features/dsdrowsydriving/).

Between 2009-2011, 73% of both fatalities and serious injuries attributed to drowsy driving involved a single vehicle. Of these collisions, 65% of fatalities and 69% of serious injuries occurred between the hours of 5 a.m.-6 p.m. (including standard daytime working hours), contrary to the popular belief that most drowsy driving happens at night. About half of fatalities (51%) and one-third (33%) of serious injuries occurred on weekends (Saturday or Sunday).

People underestimate the dangers of drowsy driving, yet fighting the urge to sleep puts everyone on the road at risk. The AAA Foundation for Traffic Safety conducted a study in 2010 of National Highway Traffic Safety Administration (NHTSA) crash data. Study results estimate drowsy driving is a factor in nearly one in six fatal crashes, and two out of five drivers surveyed (41%) admitted to falling asleep behind the wheel at some point.

Younger drivers are more likely to drive while drowsy. Based on a recent survey conducted by the AAA Foundation, one in seven licensed drivers ages 16-24 admitted to having nodded off at least once while driving in the past year as compared to one in 10 of all licensed drivers who confessed to falling asleep during the same period (Washington, D.C., November 8, 2012).

Drowsiness or fatigue can happen to any driver and is likely under-reported as a cause of traffic crashes.

These new findings echo data from the AAA Foundation's NHTSA crash data study which estimates young drivers age 16-24 were 78% more likely to be drowsy at the time of a collision than drivers age 40-59. Washington State data shows between 2002 and 2011, young drivers age 16-24 were 55% more likely to be drowsy at the time of a collision as drivers age 40-59.

Contributing Circumstances and Factors

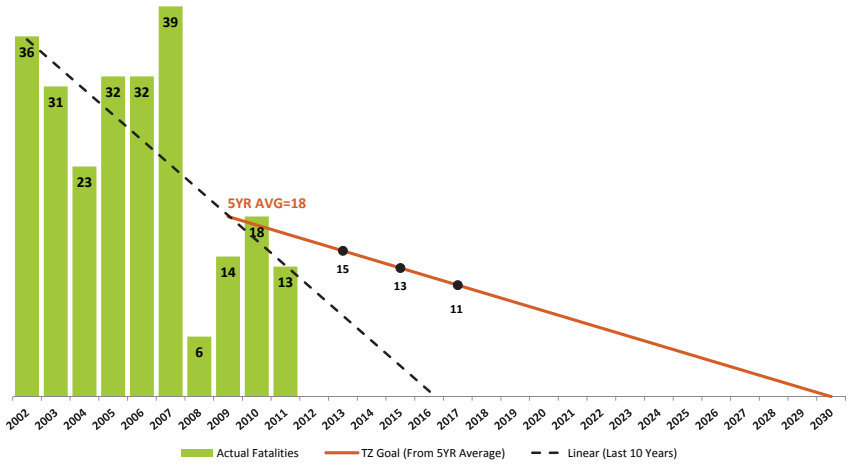
Many circumstances can contribute to drowsy driving including lack of sleep, too much time on the road without stopping, taking over-the-counter or prescription medications, or consuming drugs or alcohol. It's difficult to prove if or when a driver is drowsy, so the numbers are likely under reported. People traveling long distances often travel on highways or interstates, which is where the majority of drowsy driver involved fatalities and serious injuries occur. From 2009-2011, drowsy driver involved fatalities and serious injuries occurred most often on state routes. The majority of these crashes (over 70%) are single vehicle and/or run-off-the-road events.

Sleep Apnea

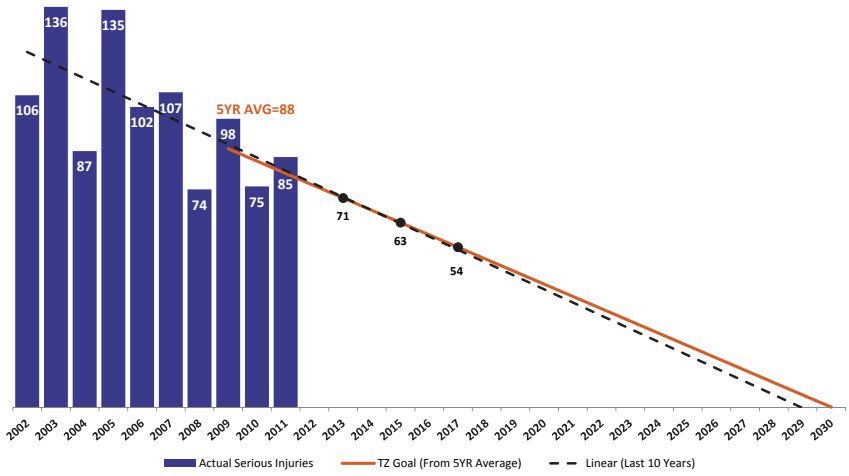
According to the Center for Sleep Disorders up to 20% of collisions that occur on monotonous roads can be attributed to sleepiness, and the most common medical cause of excessive daytime sleepiness is obstructive sleep apnea (OSA). New guidelines have been drafted to provide healthcare practitioners with a framework for the evaluation and management of sleepy driving as it relates to OSA. Center for Disease Control (CDC) representatives report that addressing the issue of drowsy driving requires the combined effort of physicians, patients and policy makers.

Specific to monotonous roads as a contributing factor in Washington State in drowsy driving collisions, 74% of fatalities and 63% of serious injuries occur on state routes. This is much higher than the average for all combined fatalities and serious injuries, 43% and 32% respectively. In contrast, drowsy driving fatalities and serious injuries occur less often on county roads (18% fatalities; 22% serious injuries) compared to the average for all fatalities (30%) and serious injuries (25%).

Drowsy Driver Involved Fatalities 2002-2011



Drowsy Driver Involved Serious Injuries 2002-2011



Programs and Successes

Engineering

The Washington State Department of Transportation (WSDOT) is addressing drowsy driving collisions through several engineering fixes including shoulder and centerline rumble strips, cable guard rails, cable median barriers and other roadside fixes.

Rest Areas

WSDOT owns and operates 48 rest areas within our state to encourage drivers to stop and rest along their journey. Most facilities are open 24 hours a day, seven days a week and offer a free coffee program. According to Safety Rest Areas Annual Safety and Preservation Reports, around 22.3 million travelers used WSDOT's safety rest areas in 2010, up 8.6% from the previous year.

Keeping Commercial Vehicle Drivers Alert

Commercial vehicle drivers are on the road more than the average commuter and finding ways to reduce their fatigue is a focus for WSDOT. The department is working to expand existing parking for heavy trucks and encouraging drivers to pull over and rest when tired. On the enforcement end, the Washington State Patrol's Commercial Vehicle Enforcement Bureau requires heavy truck operators to use log books and stop at weigh station scales to perform equipment safety checks. This practice provides accountability for limiting the number of miles and hours a driver can be on the road in a 24 hour period.

Drowsy Driving Prevention Week

The National Sleep Foundation's Drowsy Driving Prevention Week® is observed in November each year, just prior to the heavy Thanksgiving travel. This campaign provides public education about the under-reported risks of driving while drowsy and countermeasures to improve safety on the road. Supporting this effort to combat drowsy driving, former Washington State Governor Christine Gregoire signed a proclamation in November 2012. In it, she urged all Washington State citizens to join her in observing this week and raising awareness of the dangers of fatigue behind the wheel. For more information about drowsy driving, visit the National Sleep Foundation's drowsy driving website at www.DrowsyDriving.org.

American Automobile Association

The American Automobile Association (AAA) and the AAA Foundation support a variety of educational efforts to reduce drowsy driving and improve traffic safety. AAA offers some helpful tips through brochures, videos, educational campaigns and training programs.

Objectives & Strategies		
Objectives (What)	**Strategies (How)**	**Implementation Arena(s)**
1. Use roadway engineering to reduce the consequences of drowsy driving	1.1 Implement shoulder and centerline rumble strips. (P, NCHRP)	Engineering
	1.2 Implement roadway improvements to reduce the likelihood and severity of drowsy driving collisions involving run-off-the-road and head-on. (P, NCHRP)	Engineering
	1.3 Implement corridor safety model on high-crash locations where data indicates a high number of drowsy driving crashes. (R, DDACTS)	Education, Enforcement, Engineering
	1.4 Improve rest area access, security, and services. (R, NCHRP)	Engineering
2. Increase driver awareness of the risks of drowsy driving	2.1 Encourage employers to offer fatigue management programs to employees working nighttime or rotating shifts. (P, NCHRP)	Education, Leadership/ Policy
	2.2 Conduct statewide education combined with targeted enforcement targeted at drowsy drivers. (R, NCHRP)	Enforcement, Education
3. Enforce and strengthen laws and regulations aimed at reducing drowsy driving	3.1 Enhance enforcement of commercial motor vehicle hours of service regulations. (P, NCHRP)	Enforcement
	3.2 Visibly enforce existing statutes to deter drowsy driving. Consider increasing penalties for drowsy driving collisions. (U)	Enforcement, Leadership/ Policy

P = Proven **R = Recommended** **U = Unknown**

DDACTS = Data Driven Approaches to Crime and Traffic Safety
NCHRP = National Cooperative Highway Research Program

Additional Resources

AAA Foundation for Traffic Safety Website, www.aaafoundation.org/drowsy-driving

Countermeasures That Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices, 7th Edition, Chapter 4 (National Highway Traffic Safety Administration), http://www.nhtsa.gov/staticfiles/nti/pdf/811727.pdf

Drowsy Driving: Asleep at the Wheel (Centers for Disease Control and Prevention), www.cdc.gov/features/dsdrowsydriving

Drowsy Driving Website (National Sleep Foundation), www.drowsydriving.org

NCHRP Report 500, Volume 14: A Guide for Reducing Crashes Involving Drowsy and Distracted Drivers (National Cooperative Highway Research Program), http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_500v14.pdf

Performance Analysis of Centerline Rumble Strips in Washington State (Washington State Department of Transportation, 2011), http://www.wsdot.wa.gov/research/reports/fullreports/768.1.pdf

Video: Drowsy Driving (American Automobile Association), http://vimeo.com/aaapublicaffairs/review/53079717/cf11c2d33a

Video: Teens Driving while Drowsy (American Automobile Association), https://www.aaafoundation.org/videos?field_category_tid%255B%255D=40&button=DDclips

Bicyclists

In fatal and serious injury crashes, bicyclists suffer a higher percentage of deaths and serious injuries than any other road user group.

Executive Summary

Eleven bicyclists were killed on our roadways in 2011, the majority in urban areas. This number is up from six in 2010 and slightly more than the five-year average of 10 fatalities. In 2011, 112 bicyclists were seriously injured, slightly below the five-year average of 116. To reach our Target Zero goal in 2030, greater annual progress is needed in reducing bicyclist traffic deaths and serious injuries.

Background

From 2009 to 2011, there were 26 bicyclist fatalities (1.8% of total traffic deaths) and 339 seriously injured bicyclists (4.7% of all traffic-related serious injuries). When bicyclists are involved in fatal and serious injury collisions they are more frequently killed or seriously injured than any other type of roadway users. (see chart on page 26).

The 2008 Washington State Bicycle Facilities and Pedestrian Walkways Plan established statewide objectives and specific performance measures to be able to achieve zero deaths and serious injuries by 2030. Many strategies coincide with Target Zero's strategies including improving connections and bicycle facilities in urban areas, increasing safe cycling training, decreasing arterial barriers and increasing awareness about bicycle laws.

Contributing Circumstances and Factors

Contributing factors in bicycle fatalities differ from vehicle-vehicle collisions. In 48% of fatal bicyclist collisions, vehicle driver factors did not contribute to the collision. In 37% of the collisions, bicyclist factors did not contribute to the collision. When driver factors were involved, the most prevalent factors were:

1. Distracted driving (27%)
2. Driver impairment (9.6%)
3. Speeding (3.8%)

The most frequent bicyclist-related factors included:

1. Failure to yield right of way (29%)
2. Impairment (25.4%)
3. Inattention (14%)

A recent research study, by foremost traffic-injury expert Rune Elvik (Norway), shows that bicycle helmets:

- Reduce the risk of head injury by 42%
- Reduce the risk of injury to the head, face or neck by 15%

From 2009-2011, 38.4% of Washington bicyclists killed in traffic collisions were not wearing a bike helmet. Over half (51.4%) of seriously injured bicyclists were not wearing a bike helmet.

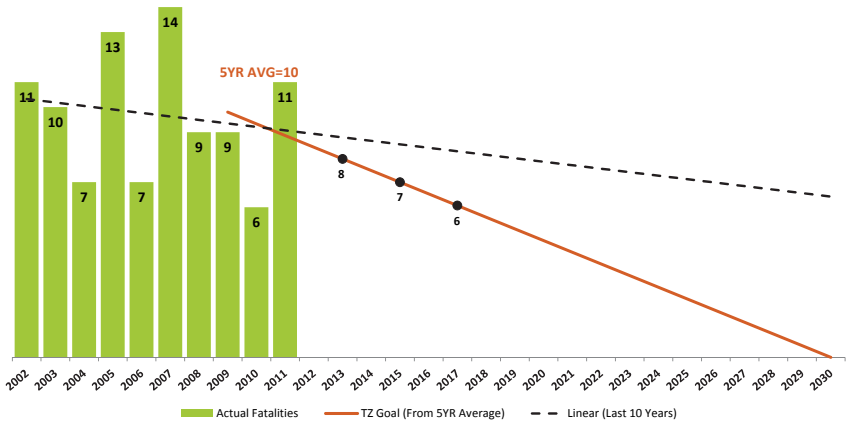
Intersections

The largest percentage of bicyclist fatalities (63%) occurred at intersections. Strategies focusing on improving conditions for bicyclists at intersections may decrease fatal collisions. These strategies include the use of green colored bike lane pavement approaching intersections, bike boxes, revisions to curb angles, and bicycle-specific signals and beacons.

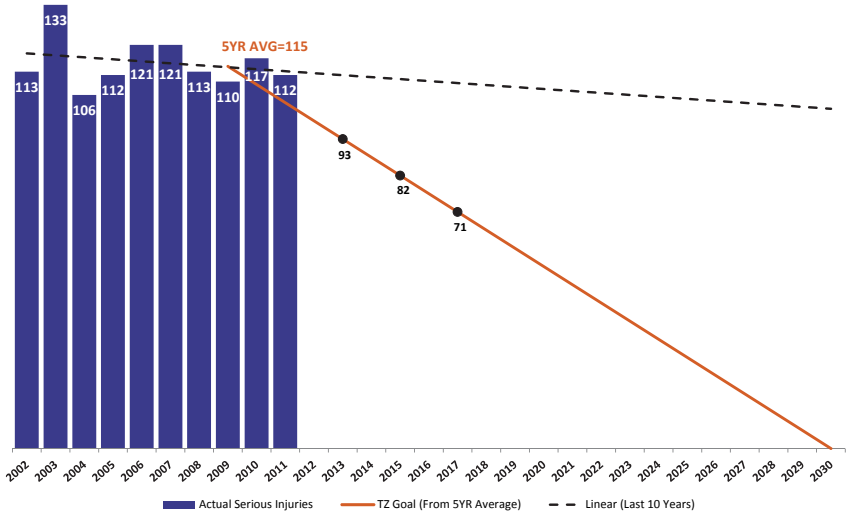
Roadways

In contrast to fatalities, the largest percentage of bicyclist serious injuries (58%) occurred on the roadway. Almost half of these serious injuries occurred while bicyclists were riding with traffic. Building dedicated facilities can increase bicycle safety and mobility. Examples include bike lanes, bicycle boulevards, separated facilities like cycle tracks, and redesign of thoroughfares using 'road diets.' Bike lanes and road diets have the potential to reduce collisions substantially between bicyclists and motor vehicle collisions.

Bicyclists Involved Fatalities 2002-2011



Bicyclists Involved Serious Injuries 2002-2011



Programs and Successes

Washington State Department of Transportation (WSDOT) initiated the Washington State Bicycle and Pedestrian Documentation Project in 2008 and started collecting data on biking and walking. WSDOT completed its fifth annual documentation project in 2012, with volunteers counting more than 40,000 pedestrians and 20,000 bicyclists at 200 locations in 38 cities.

According to WSDOT, this project found that walking and biking in Washington increased by 10% between 2008 and 2012. The highest numbers of bicyclists were observed on trails, bridges and in downtown areas. In the 24 jurisdictions where helmets are required by law, 90% of observed bicyclists wore them, compared to 63% in jurisdictions without helmet laws.

Those working with the Washington State Bicycle Facilities and Pedestrian Walkways Plans are focusing on efforts to double the amount of biking and walking over the next two decades. Bicyclists' safety may be improved by increasing the numbers of bicyclists and pedestrians on the road, increasing the likelihood motorists expect to see a bicyclist and being better prepared to respond appropriately.

Objectives & Strategies

Objectives (What)	Strategies (How)	Implementation Arena(s)
1. Improve bicyclist safety awareness and behavior	1.1 Promote use of reflective apparel among bicyclists and bicycle lights (rider conspicuity). (R, CTW)	Education
	1.2 Increase the number of people bicycling to achieve safety in numbers. (R, LIT)	Leadership/Policy, Education
	1.3 Promote bicycle helmet use with education. (U)	Education
2. Enact policies/laws to improve bicycle safety	2.1 Enact bicycle helmet laws for children (P, CTW) and adults. (R, CTW)	Leadership/Policy, Education
	2.2 Improve bicyclist rights and responsibilities training for law enforcement officers at state, Tribal, and local levels. (R, WSDOT)	Education
3. Improve bicyclist facilities	3.1 Implement traffic calming techniques. (P, NCHRP)	Engineering
	3.2 Follow national guidelines on the use of reflective markings and sign materials. (R, FHWA)	Engineering
	3.3 Construct more bike lanes, cycle tracks, and separated bicycle facilities, especially in urban areas. (R, CMF)	Engineering
	3.4 Create bicycle boulevards on low volume, low speed streets. (R, CMF)	Engineering
	3.5 Implement Complete Streets to provide for all modes of transportation. (R, NCSC)	Leadership/Policy, Engineering
	3.6 Install colored bike boxes at intersections. (U)	Engineering
4. Improve safety for children bicycling to school	4.1 Expand high visibility speed enforcement in school zones, including automated speed photo enforcement. (R, CTW)	Education, Enforcement
	4.2 Distribute and encourage the use of "School Walk and Bike Routes: A Guide for Planning and Improving Walk and Bike to School Options for Students" and assist schools in creating school biking route maps. (R, WSDOT)	Education, Engineering
	4.3 Encourage and support school districts to implement the Safe Routes to School program. (U)	Education, Engineering
5. Improve data and performance measures	5.1 Enhance attempts to collect a measure of 'miles biked' (similar to VMT). Continue to track bicycle counts through Washington's Pedestrian and Bicycle Documentation Project. (R, DDACTS)	Leadership/ Policy

P = Proven **R = Recommended** **U = Unknown**

CMF = Crash Modification Factors
DDACTS = Data Driven Approaches to Crime and Traffic Safety
LIT = Literature (Although we could not locate a meta study, there is sufficient independent literature with favorable results to justify as a recommended strategy)
CTW = Countermeasures That Work
FHWA = Federal Highway Administration
NCSC = National Complete Streets Coalition
NCHRP = National Cooperative Highway Research Program
WSDOT = WA State Dept. of Transportation

Additional Resources

Countermeasures That Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices, 7th Edition, Chapter 8 (National Highway Traffic Safety Administration), http://www.nhtsa.gov/staticfiles/nti/pdf/811727.pdf

NCHRP Report 500, Volume 18: A Guide for Reducing Collisions Involving Bicycles (National Cooperative Highway Research Program, Transportation Research Board), http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_500v18.pdf

The Gray Notebook, Edition 48, pages 5-8 (Washington State Department of Transportation), http://wsdot.wa.gov/publications/fulltext/graynotebook/Dec12.pdf

Washington's Complete Streets and Main Street Highways Case Study Resource (Washington State Department of Transportation), http://www.wsdot.wa.gov/NR/rdonlyres/A49BBBE7-16BC-4ACE-AF2B-3C14066674C9/0/CompleteStreets_110811.pdf

Washington State Bicycle and Pedestrian Documentation Project (Washington State Department of Transportation), http://www.wsdot.wa.gov/bike/Count.htm

Washington State Bicycle Facilities and Pedestrian Walkways Plan (Washington State Department of Transportation), http://www.wsdot.wa.gov/bike/bike_plan.htm

Washington State laws (RCWs) relating to bicyclists:

- *RCW 47.04.330 – Street projects – Consultation with local jurisdictions – Context sensitive design solutions*.
- *RCW 47.36.025 – Vehicle-activated traffic control signals – Detection of motorcycles and bicycles*.
- *RCW 46.61.755 – Traffic laws apply to persons riding bicycles*. When riding on a roadway, a cyclist has all the rights and responsibilities of a vehicle driver.
- *RCW 46.61.750 – Effect of regulations – Penalty*. Cyclists who violate traffic laws may be ticketed.
- *RCW 46.61.700 – Children Bicycling*. Parents or guardians may not knowingly permit bicycle traffic violations by their ward.
- *RCW 46.61.770 – Riding on roadways and bicycle paths*. Cyclists may ride side by side, but not more than two abreast. Cyclists may choose to ride on the path, bike lane, shoulder or travel lane as suits their safety needs.
- *RCW 46.61.780 – Riding at Night*. For night bicycle riding, a white front light (not a reflector) visible for 500 feet and a red rear reflector are required. A red rear light may be used in addition to the required reflector.

Municipal Rules relating to bicyclists:

- Bicycle Helmets – Currently, there is no state law requiring helmet use. However, some cities and counties do require helmets. See bicycle helmet requirements in Washington by municipality (http://www.wsdot.wa.gov/bike/helmets.htm).
- Roads Closed to Bicycles – Some designated sections of the state's limited access highway system may be closed to bicycles for safety reasons. See state highway sections closed to bicycles (http://www.wsdot.wa.gov/bike/closed.htm) for more information. In addition, local governments may adopt ordinances banning cycling on specific roads or on sidewalks within business districts.

Work Zone

Between 2009 and 2011, 9 (0.6%) fatalities and 132 (1.8%) serious injuries resulted from crashes occurring in or as a result of Washington work zones.

Collisions in work zones resulted in 9 fatalities and 132 serious injuries in the last three years of which only one was a roadway worker.

Efforts to reduce collisions and increase safety in work zone operations are overseen by the State's Work Zone Safety Task Force (WZSTF). This statewide, multi-disciplinary committee with representatives from Washington State Department of Transportation (WSDOT), the Washington State Patrol (WSP) and contractors, examines work zone issues and helps develop solutions. Among the tools used by the Task Force are: training, applying robust standards, encouraging best practices, and using innovative products. The WZSTF emphasizes education, enforcement and legislation.

WSDOT sponsors ongoing training for its employees and local agencies in best practices, to increase safety and mobility surrounding work zone projects. From 2009 to 2011, the agency proactively used the following strategies on work zone safety:

- Updating guidance documents to reflect new federal rules on work zone safety and changes in WSDOT work zone policy (R, WSDOT)
- Promoting the use of positive protection methods such as temporary concrete barriers, truck mounted attenuators and detours for separating workers from traffic (R, FHWA)
- Evaluating new work zone safety related products, devices and technology such as automated flagger assistance devices and portable signals (R, WSDOT)
- Adopting a new work zone speed limit reduction policy (R, WSDOT)
- Conducting a self-assessment with the Federal Highway Administration (R, FHWA)

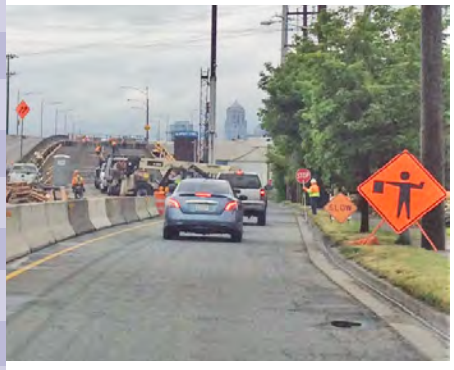
Strategies

- Improve visibility of work zone traffic control devices and ensure they are clean and in good working condition (R, NCHRP)
- Improve work zone design practices (R, NCHRP)
- Provide safe and accessible conditions for emergency responders in work zones (R, OSHA)
- Require reflective apparel for all emergency responders (R, FHWA)
- Improve worker safety planning through basic hazard assessments and job classification requirements in the work zone area (R, OSHA)
- Certify all workers who work in the boundaries of work zones (R, OSHA)
- Use high visibility enforcement such as enhanced patrols, photo enforcement and police-operated photo radar enforcement vans in work zones (R, NCHRP)
- Ensure good public notification of conditions so drivers are prepared or may choose alternative routes (R, NCHRP)

P = Proven **R = Recommended** **U = Unknown**

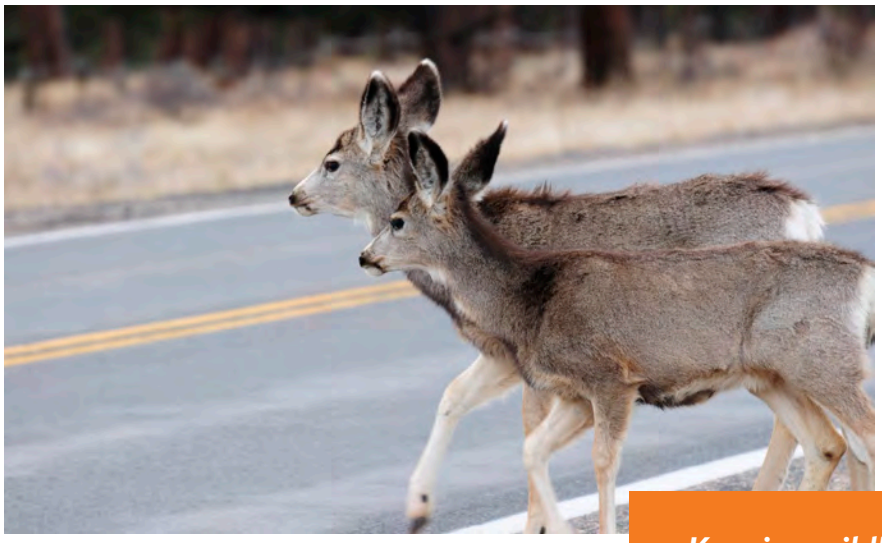
FHWA = Federal Highway Administration
NCHRP = National Cooperative Highway Research Program
OSHA = Occupational Safety and Health Administration
WSDOT = Washington State Department of Transportation

Work Zone		
Year	**Fatalities**	**Serious Injuries**
2002	15	31
2003	17	27
2004	7	24
2005	8	33
2006	16	49
2007	2	45
2008	3	29
2009	1	41
2010	1	53
2011	7	38
Totals	**77**	**370**



Wildlife

Wildlife collisions accounted for eight fatalities (0.6%) and 78 serious injuries (1.1%) between 2009 and 2011 in Washington State.



The Washington State Department of Transportation (WSDOT) has adopted a habitat connectivity policy mandating consideration of habitat and wildlife in all state transportation actions. Over the last 30 years, WSDOT has invested in a wide variety of infrastructure to benefit wildlife and reduce wildlife-vehicle collisions. Projects range from building large mammal crossing structures to installing wildlife barrier fencing.

In 2005, WSDOT received funding to expand I-90 east of Snoqualmie. For many species, this section of I-90 bisects key migration corridors connecting the north and south Cascades. Because of this, WSDOT and wildlife advocates took the opportunity to create wildlife crossings that would reconnect habitat on opposite sides of the freeway. The project includes several state-of-the-art bridges that allow wildlife to travel under and over the freeway. Fences parallel to the road funnel animals into the passageways, keeping them from the roadway. Remote cameras will monitor wildlife movements to ensure the new crossings are being used.

Wildlife		
Year	**Fatalities**	**Serious Injuries**
2002	0	13
2003	0	12
2004	7	16
2005	0	18
2006	1	21
2007	3	22
2008	5	29
2009	4	34
2010	4	31
2011	0	13
Totals	**24**	**209**

Keeping wildlife off the road helps save human lives as well as animals.

Strategies

- Employ engineering strategies to decrease wildlife collisions (P, CMF)
- Increase active and passive roadway signage of wildlife crossings (R, FHWA)
- Install animal detection systems to warn motorists of wildlife (R, FHWA)
- Increase upfront funding for innovative wildlife crossings in projects built in high wildlife population areas (R, FHWA)
- Promote clear sight lines in areas with abundant wildlife (U)
- Utilize public service announcements in areas with high wildlife collision rates (U)

P = Proven
R = Recommended
U = Unknown

CMF = Crash Modification Factors
FHWA = Federal Highway Administration

School Bus Involved

In Washington State between 2009 and 2011, school bus involved collisions have accounted for three fatalities (0.2% of state total) and 18 serious injuries (0.2%).

Only one school bus occupant has been killed in a collision in Washington State since 1994, a school bus driver in 1996. Fatalities related to school bus transportation tend to occur during loading or unloading of the school bus and are counted as pedestrians, rather than school bus occupants. The 12 fatalities represented in the chart are either non-motorists or occupants of other vehicles, not occupants of school buses. Five of the 12 fatalities were non-motorists (all occurring between 2003 and 2008), and none of them were school children.

A one day statewide count on May 1, 2013, (required by legislation) reported enough violations of the loading flashing light system that would result (extrapolated) in over 500,000 violations per year. With that level of violations, students' safety crossing the street before getting on the bus or after disembarking is a major concern.

School bus travel remains the safest way to send children to school.

School Bus Involved

Year	Fatalities	Serious Injuries
2002	1	5
2003	2	9
2004	2	3
2005	3	5
2006	0	5
2007	0	4
2008	1	4
2009	0	8
2010	1	7
2011	2	3
Totals	**12***	**53**

*None of these fatalities were school children.

Strategies

The state will continue to ensure:

- Every school bus driver receives training modeled after 'The School Bus Driver In-Service Safety Series' (R, NHTSA)
- School districts implement, enhance, or improve student training in school bus safety (U)
- Enforcement of laws relating to overtaking or meeting a school bus when stopped for the purpose of receiving or discharging children and the bus' hazard warning lamps are activated (U)

P = Proven
R = Recommended
U = Unknown

NHTSA = National Highway Traffic Safety Administration

Vehicle-Train

"Highway-rail grade crossings" are intersections involving two very different modes of transportation. The unique character of these intersections is enhanced by the fact they are also multi-jurisdictional. Highway authorities and railroads have responsibility for different aspects of design and maintenance, while the Washington Utilities and Transportation Commission has regulatory authority over public safety.

Highway-rail crossings are unique junctions with responsibility for safety crossing multiple jurisdictions.

The data reporting scope of Target Zero is limited to traffic-related fatalities and injuries occurring at crossings accessible to the public. However, the strategies provided may also be applied at private crossings to reduce the incidence of non-traffic fatalities and injuries.

In Washington State, vehicle-train crashes occurring at grade crossings accounted for two fatalities (0.1% of the state's total) and three serious injuries (0.04%) between 2009 and 2011.

Nationally since the early 1970s, the majority of safety improvements at public railroad grade crossings have been implemented through grants from the Federal Highway-Rail Grade Crossings Safety Program authorized in successive federal transportation bills.

In the most recent bill, MAP-21 provides a set-aside for crossing hazard elimination and requires the state to use the funds for installing protective devices at railway-highway intersections. This effort is administered by WSDOT program management and includes 40 potential crossings for safety upgrades.

Vehicle-Train Involved		
Year	**Fatalities**	**Serious Injuries**
2002	0	3
2003	0	2
2004	1	0
2005	4	2
2006	5	3
2007	2	2
2008	1	1
2009	0	1
2010	1	2
2011	1	0
Totals	**15**	**16**

Strategies

- Upgrade crossings with only signs to flashing lights and gates (P, CMF)
- Ensure existing warning devices are compliant with all applicable regulatory requirements (P, FHWA)
- Conduct periodic safety assessments to identify crossings in need of improvements, including upgrading warning devices, addressing hazards related to highway/railroad geometry and removing sight obstructions (R, CMF)
- Partner with railroads and the Utilities and Transportation Commission to address identified safety issues, including taking advantage of available federal and state hazard elimination grants (R, FHWA, UTC)
- Improve railroad grade crossings within Intercity High Speed Passenger Rail Program projects (R, FRA)
- Implement rail safety public education through partnership with Washington Operation Lifesaver (R, UTC)
- Include railroad crossing upgrades in corridor safety planning (U)

P = Proven **R = Recommended** **U = Unknown**

CMF = Crash Modification Factors
FHWA = Federal Highway Administration
FRA = Federal Railroad Administration
UTC = Utilities and Transportation Commission