



6. EMPHASIS AREAS

Emphasis Areas (EA) provide a strategic framework for developing and implementing the Transportation Safety Action Plan (TSAP). Emphasis Areas are near-term implementation focus areas directly related to the TSAP's long-term goals, policies, and strategies.

EAs also provide a framework for the Oregon Department of Transportation to meet Federal requirements for project and program prioritization. Emphasis areas are flexible and adaptive to new safety challenges and opportunities that may arise during implementation of the TSAP. The EAs were developed using the results of crash data analysis and input from committees, stakeholders, and the public. From this, four broad emphasis areas were chosen: Infrastructure, Risky Behaviors, Vulnerable Users, and Improved Systems. Each of these includes a number of subcategories to better define the EA.

- **Emphasis Area: Risky Behaviors.** Reductions in fatalities and serious injuries can be accomplished by deterring unsafe or risky behaviors made by drivers and other transportation users. For this emphasis area, actions have been identified to minimize impaired, unrestrained, speeding and distracted driving crashes.
- **Emphasis Area: Infrastructure.** Road assets in Oregon can be constructed or retrofitted to reduce fatal and serious injury crashes. Opportunities to do this include implementing safety treatments at intersections and along and across roadways. For this emphasis area, actions have been identified to minimize intersection and roadway departure crashes.
- **Emphasis Area: Vulnerable Users.** Vulnerable road users can be characterized by the amount of protection they have when using the transportation system – pedestrians, bicyclists, and motorcyclists are more exposed than the drivers operating vehicles, making them more susceptible to injury in the event of an incident. Older drivers and other older system users can also be vulnerable due to decreasing visual acuity and perception-reaction time to events, and injuries are more likely to be fatal or severe due to conditions of aging such as physical frailty and slower recovery times. For this emphasis area, actions have been identified to minimize pedestrian, bicycle, motorcycle, and older road user crashes.
- **Emphasis Area: Improved Systems.** Opportunities to address and improve transportation safety come in a number of forms. Crash and other types of safety data can be advanced to better understand the causes and locations of crashes, leading to targeted solutions. Training and education are used to educate planners, engineers, designers,

Emphasis Areas provide a strategic framework for developing action items for near-term implementation.

Emphasis Areas focus near-term safety projects, programs, and policies on actions that will maximize the benefits of safety investment.

- ### RISKY BEHAVIOR SUBAREAS
- Impaired Driving.
 - Unbelted Occupants.
 - Speeding.
 - Distracted Driving.

- ### INFRASTRUCTURE SUBAREAS
- Intersection.
 - Roadway Departure.

- ### VULNERABLE USER SUBAREAS
- Pedestrians.
 - Bicyclists.
 - Motorcyclists.
 - Older Road Users.



and construction staff about the importance of safety and how to incorporate it into their everyday job responsibilities. Fully staffed and funded law enforcement agencies can direct their efforts towards keeping users safe and when crashes do occur, making sure emergency medical services are available to respond to and transport victims is essential. Commercial vehicle safety relies on licensing, training, and vehicle safety to decrease the frequency and severity of crashes. For this emphasis area, actions have been identified to continually improve data, train transportation and safety staff, support law enforcement and emergency responders, and minimize commercial vehicle crashes.

IMPROVED SYSTEM SUBAREAS

- Improved Data.
- Training and Education.
- Enforcement.
- Emergency Medical Services.
- Commercial Vehicles.

This chapter describes each of the EA subcategories, the data used to support the identification of EA priorities, and near-term actions that can be implemented to lower fatalities and serious injuries for each emphasis area.

EMPHASIS AREA CONSIDERATIONS

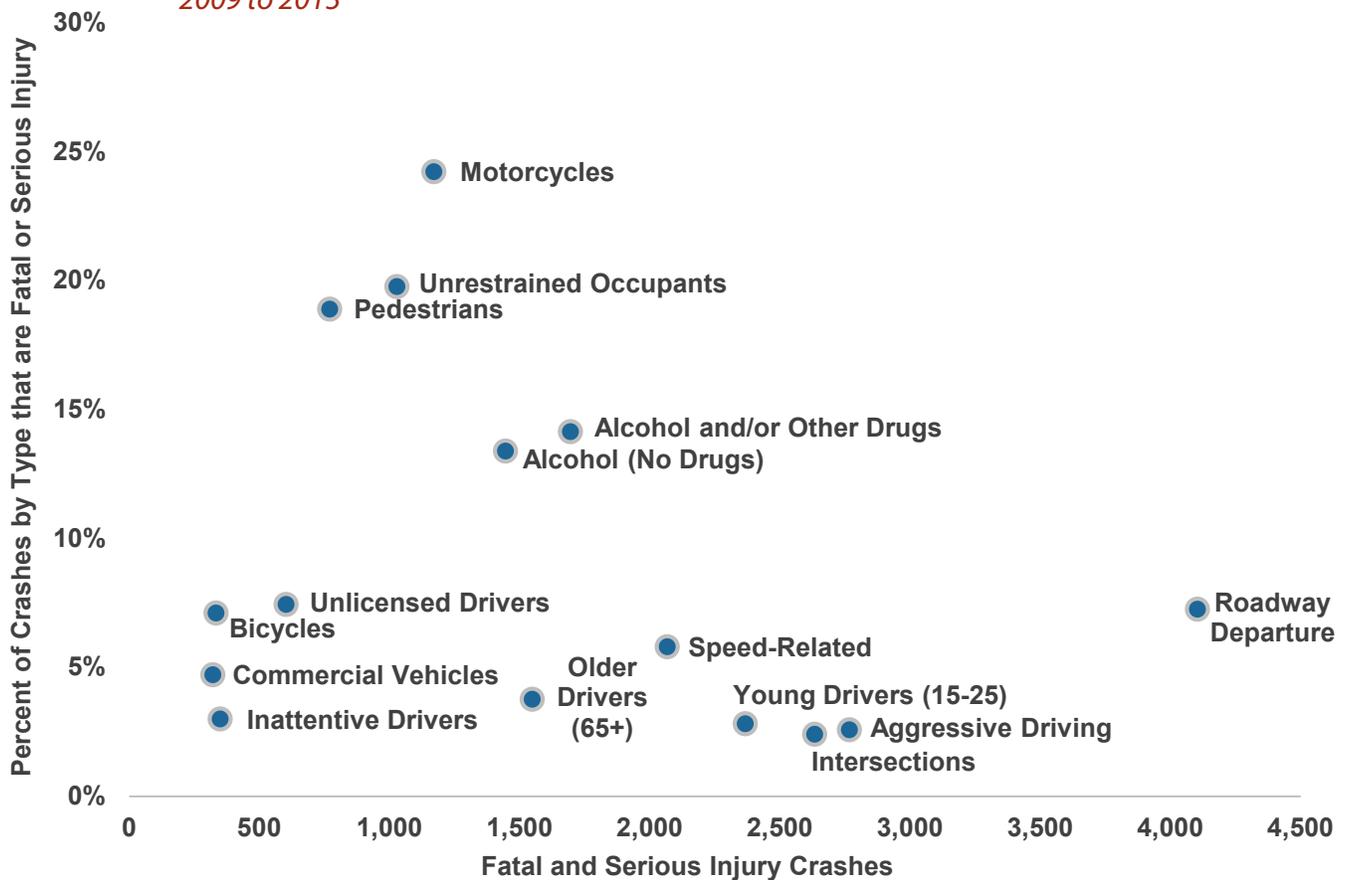
EAs were selected based on an assessment of recent crash history (2009 to 2013) and qualitative considerations related to the capabilities to address different crash types. Figure 6.1 shows the relationship of crash frequency and crash severity. Fatal and serious injury crashes are ranked by frequency along the x-axis and by severity along the y-axis. Crash types toward the upper right part of the figure rank more highly from the perspective of being frequent and severe. Appendix F shows the underlying data for this figure.

FREQUENCY AND SEVERITY RANKING OF CRASHES

- Roadway departure crashes are most frequent; approximately percent of these include fatal or serious injuries.
- Motorcycle crashes are less frequent; approximately 25 percent of these include fatal or serious injuries.
- Motorcyclists, unrestrained occupants, and pedestrians have the highest severity ranking.
- Roadway departure, aggressive driving, and intersections have the highest frequency ranking.



Figure 6.1 Crash Types Ranked by Crash Frequency and Severity
2009 to 2013



From a qualitative perspective emphasis areas also were selected considering these questions:

- **Effectiveness Data.** Are there proven countermeasures available for use in Oregon? If not, is there an ability and commitment to evaluate effectiveness of programs and projects?
- **Institutional Capacity.** Are there agencies or individuals who are able to commit ongoing staff resources to address this safety problem?
- **Emphasis Area Overlap.** Does the potential emphasis area significantly overlap with other potential emphasis areas and, if so, can they both be addressed simultaneously?
- **Consistency with Existing Plans and Policies.** Is the potential EA consistent with other state plans and policies and does it address a significant policy goal?
- **Public Input.** Are there issues the public perceives as critical to driving down fatalities and serious injuries? Can these issues be addressed within the framework of the TSAP?

Figure 6.2 shows the resulting evaluation of potential EAs using the frequency severity chart and the above qualitative categories. As shown emphasis areas were evaluated as strong, moderate, or weak emphasis area candidates for each criterion. The PAC reviewed this information as well as input from stakeholders to select emphasis areas for the TSAP.²²

²² Distracted driving was identified as an emphasis subcategory because available data and anecdotal evidence point to distraction as a significant traffic safety concern. A recent survey conducted by Southern Oregon University found that three out of four drivers surveyed engage in distracted driving. Furthermore, 83 percent of respondents felt that distracted driving is an important safety concern on Oregon's roads.



Figure 6.2 Emphasis Area Evaluation

Potential Emphasis Area	Frequency	Severity	Effectiveness Data	Emphasis Area Overlap	Institutional Capacity	Policy Focus
Aggressive Driving	●	○	◐	○	◐	●
Impaired Driving	◐	●	●	○	●	●
Bicycles	○	◐	◐	●	●	●
Commercial Vehicles	○	◐	○	●	●	◐
Distracted Driving (Inattentive Drivers)	○	○	○	●	○	○
Intersections	●	○	●	●	●	●
Motorcycles	◐	●	◐	○	◐	●
Older Drivers (65+)	◐	○	○	◐	◐	◐
Pedestrians	○	●	◐	●	●	●
Roadway Departure	●	◐	●	◐	●	●
Speed-Related	●	◐	◐	○	◐	●
Unlicensed Drivers	○	●	○	●	○	○
Unrestrained Occupants	◐	●	●	○	◐	●
Young Drivers (15-25)	●	○	◐	◐	◐	●
Foundational EAs (EMS, Data, and Training)					●	●
●	Strong Emphasis Area Candidate					
◐	Moderate Emphasis Area Candidate					
○	Weak Emphasis Area Candidate					

Frequency = number of fatal and serious injury crashes from 2009 to 2013; Severity = fatal and serious injury crashes per 100 total crashes; Effectiveness Data = proven, effective countermeasures are known, or projects and programs can be evaluated for effectiveness; Emphasis Area Overlap = the potential EA significantly overlaps with one or more other potential emphasis areas; Institutional Capacity = there are existing programs and resources to support implementation of strategies related to this potential EA; Policy Focus = the potential EA represents a significant policy focus for Oregon.



EMPHASIS AREAS AND ACTIONS

This section describes each EA subcategory and the accompanying actions. Actions are specific programs, policies, projects and potential future legal policy changes for implementing the EAs over the next five years. The actions listed are achievable and, where possible, proven effective. For actions that have not been tested for their effectiveness, they will be evaluated during implementation to understand their contribution to crash reductions. The actions are categorized by the primary EA they address, but many have the potential to contribute to fatality and serious injury reductions across multiple EAs. While this section focuses on the implementation of safety solutions over the next five years, each EA and action also will contribute to the success of the long-term goals, policies, and strategies outlined in Chapter 5.

Emphasis Area: Risky Behaviors

Impaired Driving

Alcohol impairment is measured as blood alcohol concentration (BAC) reading of 0.08 percent or higher for drivers and 0.04 percent for commercial motor vehicle drivers. In Oregon, as in most states, the penalties are severe for drinking and driving and could result in jail time, a suspended or revoked license, substance abuse treatment requirements, and/or fines. While the risks of driving under the influence of alcohol are well known, thresholds for impairment and testing for drugged driving are less well established. Drivers may not fully understand how DUI standards apply when driving on prescription or recreational drugs. In addition, law enforcement agencies are still refining detection processes. Drugged driving is impaired driving and research and improvements in test methods are ongoing in this area. In Oregon, impaired driving crashes are defined as crashes in which the reporting officer indicates alcohol or other drugs were somehow involved in the crash. These crashes could include alcohol only, marijuana and illegal prescription drugs, or a combination of drugs and alcohol.

Problem Identification

Between 2009 and 2013, impaired driving crashes (alcohol and/or drugs) accounted for 22 percent of all the fatal and serious injury crashes in Oregon and contributed to 625 fatalities and 1,087 serious injuries.

Crashes occur more or less equally in rural Oregon (52 percent) and urban parts of the state (48 percent). About 70 percent of impaired driving crashes involved roadway departures. Aggressive driving (44 percent) and speed (42 percent) related crashes are also common in conjunction with impaired driving crashes.



Figure 6.3 Impaired Driving Fatalities and Serious Injuries by Year
2009 to 2013

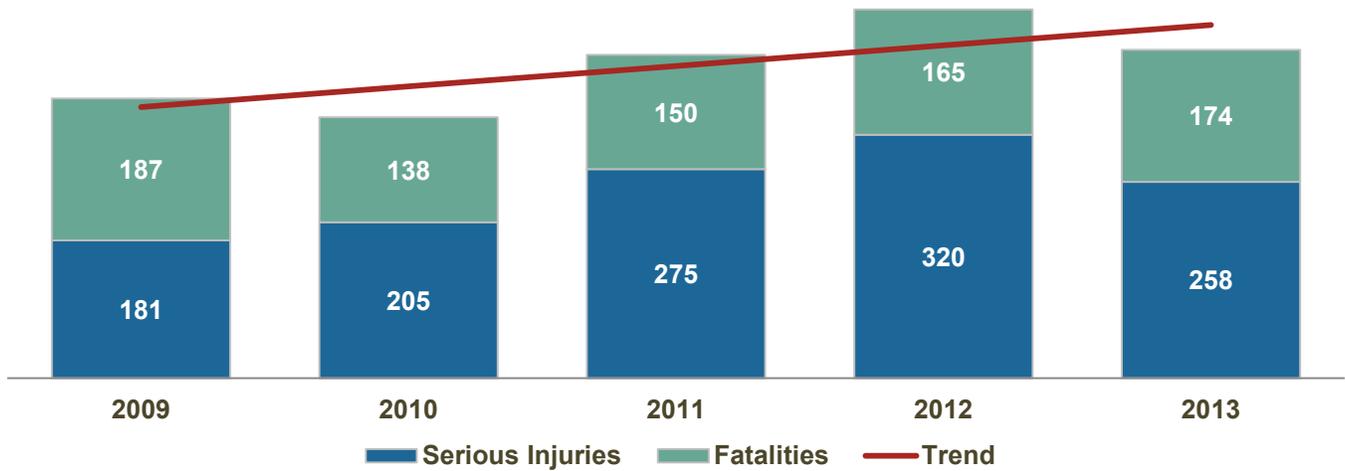
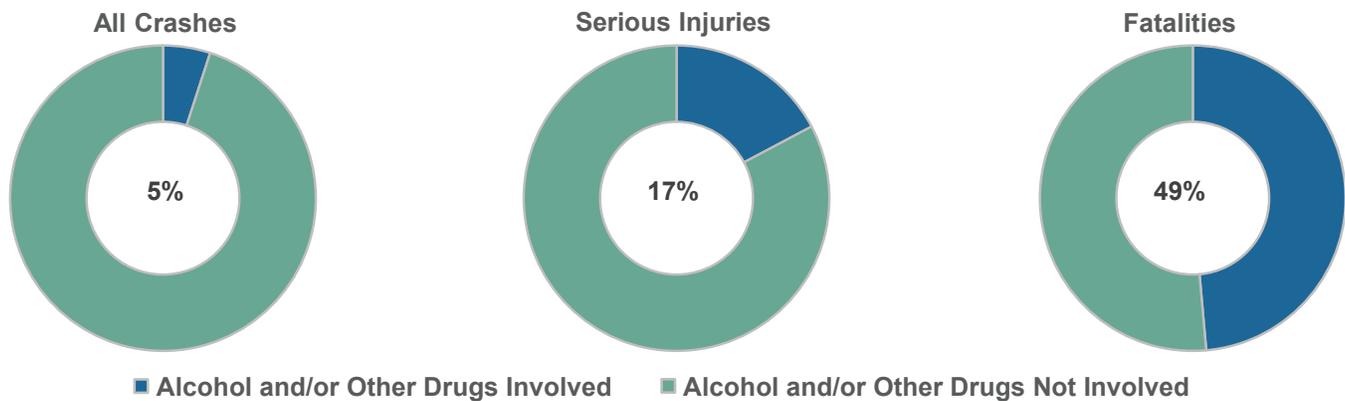


Figure 6.4 Impaired Driving as a Contributing Factor for All Crashes, Serious Injuries, and Fatalities





Impaired Driving Actions

Table 6.1 Impaired Driving Actions

Tier 1	
Action 6.1.1:	Change social norms by increasing awareness of the types of impaired driving (e.g., drunk driving, drugged driving, and driving under the influence of prescription drugs). Co-Benefits: Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users
Action 6.1.2:	Provide training and education on marijuana impairment detection for law enforcement. Co-Benefits: Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users, Training, Enforcement
Action 6.1.3:	Conduct targeted impaired driving enforcement. Co-Benefits: Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users, Data, Enforcement
Action 6.1.4:	Adopt National Transportation Safety Board recommendation to reduce Blood Alcohol Concentration limit to 0.05. Co-Benefits: Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users, Enforcement
Action 6.1.5:	Revise DUII statutes with the objective of eliminating impaired driving as a crash cause. Co-Benefits: Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users, Enforcement
Tier 2	
Action 6.1.6:	Strengthen laws aimed at reducing repeat DUII offenders Co-Benefits: Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users, Enforcement
Action 6.1.7:	Improve DUII arrest and adjudication processes Co-Benefits: Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users, Enforcement

Occupant Protection

In Oregon, passenger car drivers, pickup truck drivers, and sports car drivers are often using their seatbelts – the national average for observed seatbelt use in 2014 was 87 percent for passenger cars and in Oregon it was 98 percent.²³ While wearing a seatbelt has become a cultural norm in Oregon, the numbers also reflect targeted enforcement efforts – in 2014, 7,429 seat belt citations were issued in Oregon through a grant funded program. Residents now recognize that the use of restraints and child car seats reduces the severity of a crash.²⁴ In Oregon, unbelted crashes are defined as one or more victims are not using appropriate protection. Enforcement of occupant protection laws and education about proper use of restraints for adults and children will continue to have a positive impact on reducing crash severity.

Problem Identification

Between 2009 and 2013, crashes involving occupants not properly using restraints accounted for 13 percent of all the fatal and serious injury crashes in Oregon and contributed to 490 fatalities and 881 serious injuries. Approximately 65 percent of these crashes occurred in a rural environment. Almost all unrestrained fatal and serious injury crashes (72 percent) result from lane departure crashes. Aggressive driving (44 percent) and speeding (41 percent) also are strongly correlated to unrestrained crashes.

²³ <https://www.oregon.gov/ODOT/TS/docs/+2016%20Federal%20Version%20Final.pdf>.

²⁴ <https://www.oregon.gov/ODOT/TS/docs/+2016%20Federal%20Version%20Final.pdf>.



Figure 6.5 Unrestrained Occupant Fatalities and Serious Injuries by Year
2009 to 2013

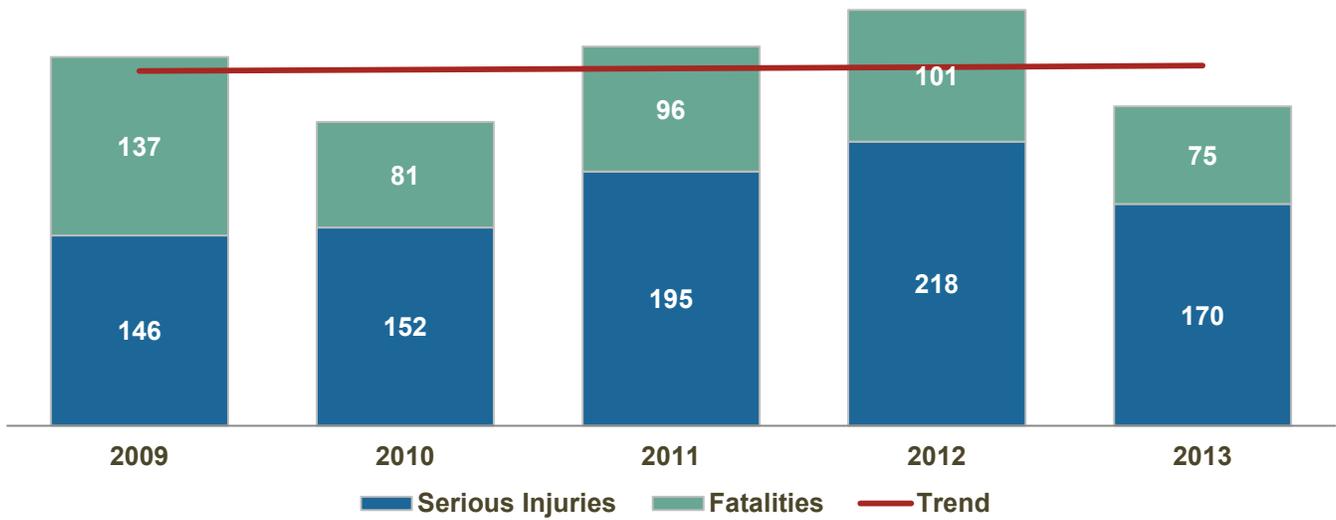
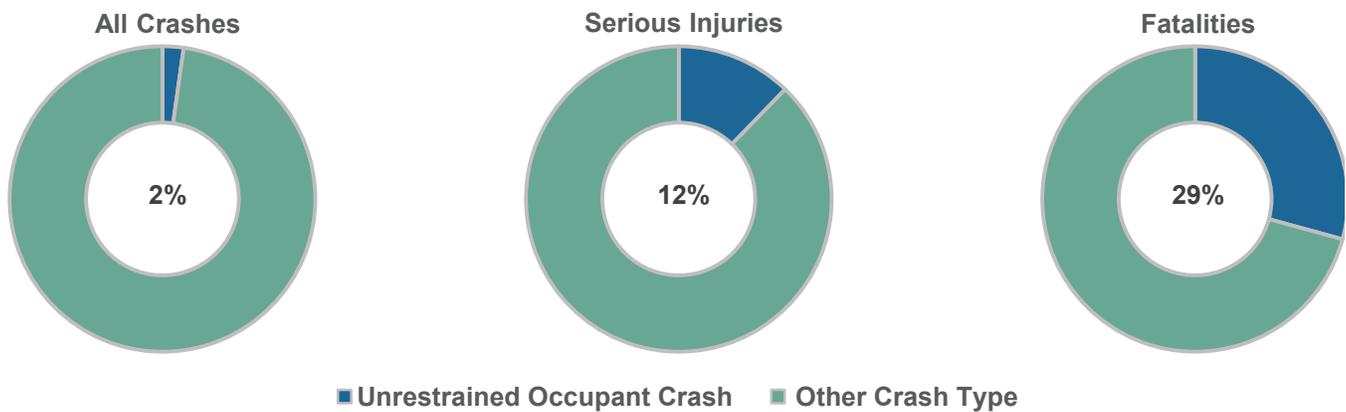


Figure 6.6 Failure to use Restraints for All Crashes, Serious Injuries, and Fatalities





Occupant Protection Actions

Table 6.2 Occupant Protection Actions

Tier 1	
Action 6.2.1:	Conduct targeted enforcement of occupant protection laws.
Co-Benefits:	Enforcement, Young Drivers, Older Drivers
Tier 2	
Action 6.2.2:	Conduct targeted education to increase the use of seat belts and child safety seats.
Co-Benefits:	Older Road Users, Training
Action 6.2.3:	Provide youth safety items (e.g., child safety seats, bicycle helmets) to satisfy public demand.
Co-Benefits:	Intersections, Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users
Action 6.2.4:	Recruit and train certified child passenger safety (CPS) technicians as needed.
Co-Benefits:	Training

Speeding

In Oregon, speeding crashes are defined as a vehicle traveling too fast for conditions, or traveling above the posted or statutory speed limit. Speed-related fatalities and serious injuries have been trending downward, on average, since 2009. In Federal Fiscal Year 2014, law enforcement issued 21,732 speeding citations, during grant-funded, targeted enforcement efforts, to deter this unsafe driving behavior.²⁵

An Oregon statewide public opinion survey from March 2013 reported that 76 percent of drivers say they rarely exceed the speed limit on a local road with a posted speed of 30 miles per hour and 77 percent say they rarely exceed it on a road with a speed limit of 65 miles per hour.²⁶ To the extent that this self-reported information is accurate, an estimated 24% of Oregon drivers do sometimes or regularly exceed posted speeds, which is consistent with a Federal estimate that at least 30 percent of drivers speed (NHTSA, *National Traffic Speeds Survey II*, August 2012). Speed is implicated in 27 percent of crashes in Oregon. The outcome of speeding crashes is often severe. Targeted enforcement, including traffic patrols and effective automated enforcement will continue to be implemented throughout Oregon. In addition, roadway design and speed limits will be considered in tandem to achieve safe operating speeds.

Problem Identification

Between 2009 and 2013, speed-related crashes accounted for 27 percent of all the fatal and serious injury crashes in Oregon and contributed to 619 fatalities and 1,897 serious injuries. About 70 percent of these crashes occurred in a rural environment. Almost all speed-related fatal and serious injury crashes (85 percent) result from lane departure crashes. Alcohol involvement (30 percent) and unrestrained occupants (20 percent) also are strongly correlated to speeding crashes. It is important for all stakeholders (e.g., residents, business owners, local, regional and state agencies) be engaged in the process of identifying the appropriate speed for a roadway. The roadway can then be appropriately designed and built or retrofitted to achieve the desired travel speed.

²⁵ <https://www.oregon.gov/ODOT/TS/docs/+2016%20Federal%20Version%20Final.pdf>.

²⁶ <https://www.oregon.gov/ODOT/TS/docs/+2016%20Federal%20Version%20Final.pdf>.



Figure 6.7 Speed-Related Fatalities and Serious Injuries by Year
2009 to 2013

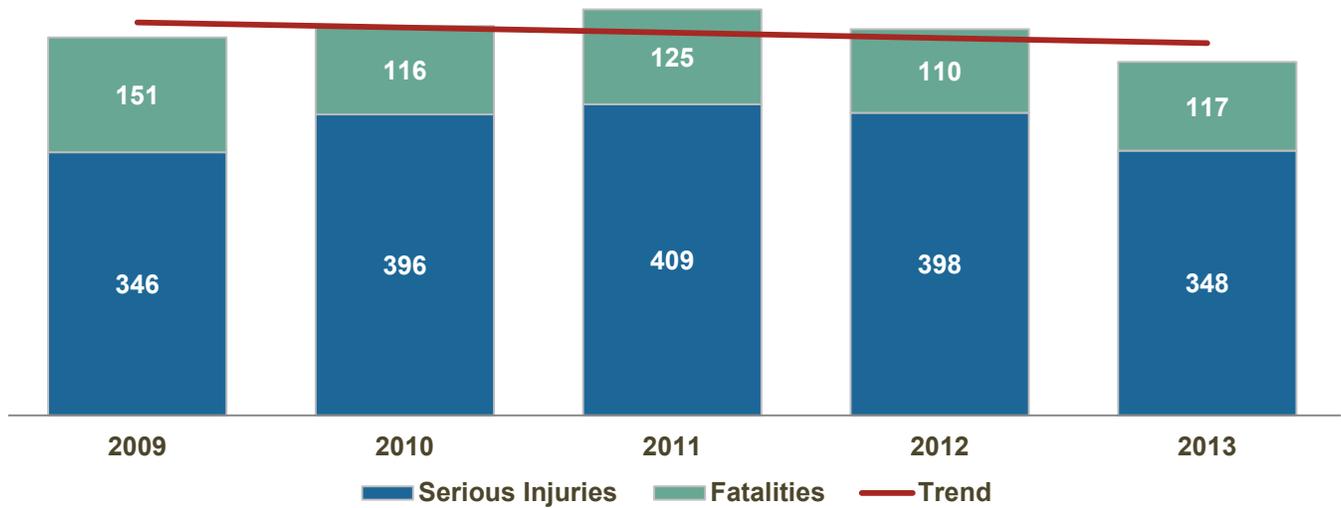
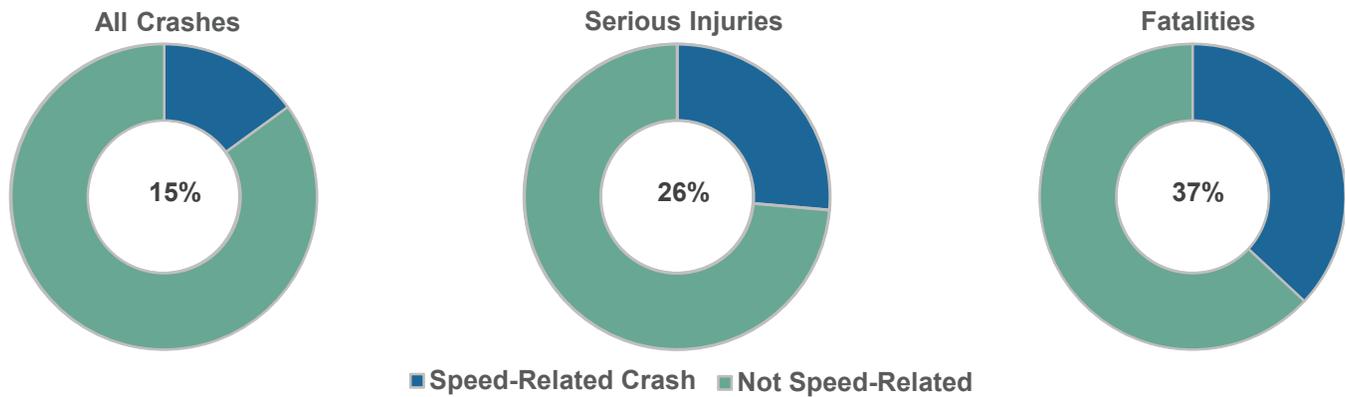


Figure 6.8 Speeding as a Contributing Factor for All Crashes, Serious Injuries, and Fatalities





Speeding Actions

Table 6.3 Speeding Actions

Tier 1	
Action 6.3.1:	Educate all transportation system users about the dangers of speeding. Co-Benefits: Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users, Young Drivers
Action 6.3.2:	Continue work between ODOT, cities, and counties to consider and revise, as appropriate, regulations and programs for establishing speed limits to achieve safety goals, improve balance among multimodal interests, and support community objectives Co-Benefits: Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users, Enforcement
Action 6.3.3:	Establish the same statutory speed limits in residential and business districts. Co-Benefits: Intersections, Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users, Enforcement
Action 6.3.4:	Modify laws to allow more effective automated enforcement of traffic laws. Co-Benefits: Motorcycles, Pedestrians, Bicyclists, Older Road Users, Enforcement
Action 6.3.5:	Track and assess changes to crash rates, fatalities, and serious injuries on highways recently approved for higher speed limits. Co-Benefits: Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users, Data
Action 6.3.6:	Focus facility design and redesign to achieve operating speeds consistent with safety goals, context, users and land use. Co-Benefits: Intersections, Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users
Action 6.3.7:	Conduct targeted enforcement to reduce speeding. Co-Benefits: Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users, Data, Enforcement

Distracted Driving

Distracted driving is operating a motor vehicle while doing another activity that takes your attention away from safely driving.²⁷ The proliferation of cell phones and other mobile electronic devices has resulted in an increased distracted population. Available data and anecdotal evidence point to distraction as a significant traffic safety concern. A recent survey conducted by Southern Oregon University found that three out of four drivers surveyed engage in distracted driving.

Previous exceptions in Oregon’s distracted driving law allowed drivers to use handheld cell phones if the call was related to their jobs. Some of those exceptions were removed effective 2013, but most exceptions still need to be removed. Legislation must change the law to make this law clear, enforceable and convictable by removing all exceptions but emergency vehicles/employees while responding to an emergency and a driver calling 911 for an emergency when no one else is available to make the call. Also, the law needs to be very specific in definition to include current and future technologies, changing it to “mobile electronic devices” for example. Drivers under 18 years old are prohibited from all cell phone use, hand held or hands free.

One of the first actions recommended in this subarea is to define and assess the scale of distracted driving in Oregon.

²⁷ https://www.oregon.gov/ODOT/DMV/Pages/road_rules.aspx (accessed 3/16/16).



Distracted Driving Actions

Table 6.4 Distracted Driving Actions

Tier 1	
Action 6.4.1:	Support the task force on distracted driving and implement countermeasures. Co-Benefits: –
Action 6.4.2:	Decrease distracted driving through education and changing social norms. Co-Benefits: Pedestrians, Bicyclists, Older Road Users
Action 6.4.3:	Work with other states on research and data development to identify the scope and scale of distracted driving and possible solutions. Co-Benefits: Distracted Driving, Data
Action 6.4.4:	Adopt and revise current distracted driving law to remove loopholes and be consistent with Federal guidance. Co-Benefits: Motorcycles, Pedestrians, Bicyclists, Older Road Users, Enforcement
Tier 2	
Action 6.4.5:	Conduct targeted enforcement to enforce distracted driving laws. Co-Benefits: Enforcement

Emphasis Area: Infrastructure

Intersections

An intersection is a point at which two or more roads intersect. Most intersections are designed for motorized vehicles as well as pedestrians, bicyclists, transit users and freight travel. An inherent concern at intersections is that they create conflict points among multiple road users, which can be exacerbated by differences in vehicle size and travel speed as well as the complexity of the intersection design. Intersection crashes in Oregon are defined as incidents that occur at a signalized or unsignalized intersection in an urban or rural environment.

Problem Overview

Between 2009 and 2013, intersection-related crashes accounted for 34 percent of all the fatal and serious injury crashes in Oregon and contributed to 335 fatalities and 2,613 serious injuries. About 76 percent of these crashes occurred in an urban environment; and older drivers, aggressive drivers, and younger drivers were disproportionately more involved in intersection crashes.



Figure 6.9 Intersection-Related Fatalities and Serious Injuries by Year
2009 to 2013

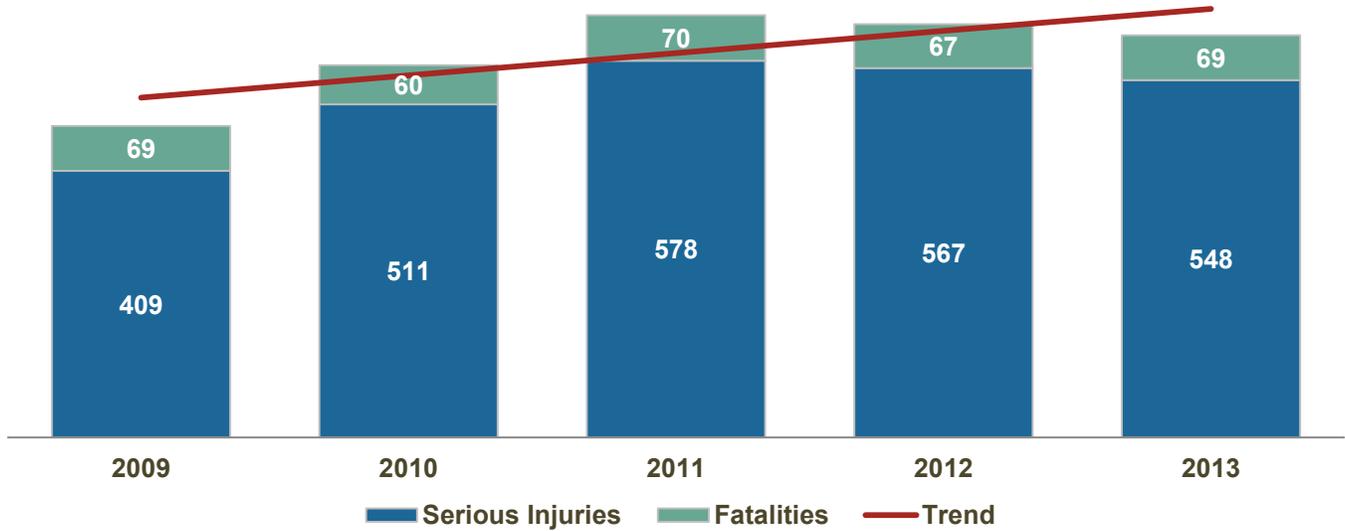
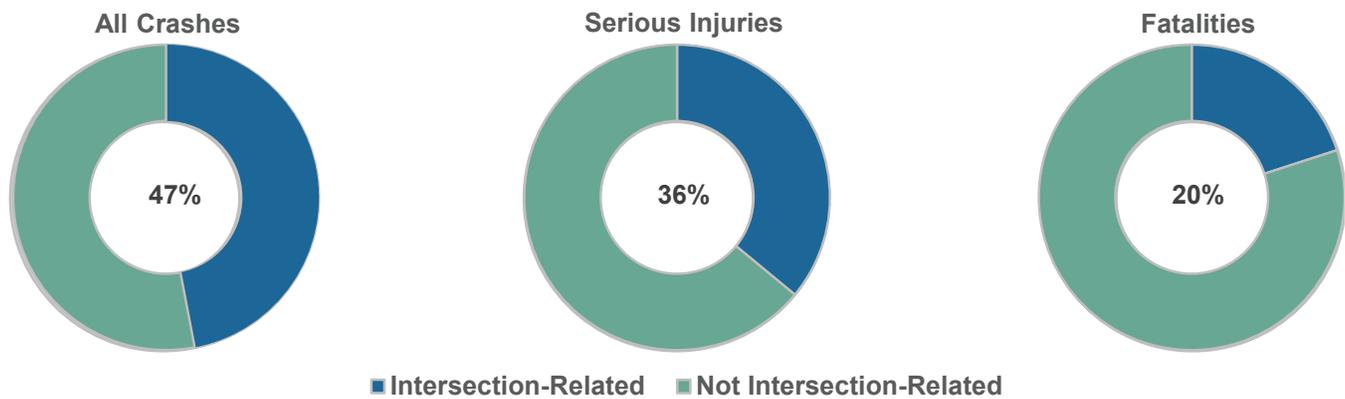


Figure 6.10 Intersection-Related Crashes as a Percentage of All Crashes, Serious Injuries, and Fatalities



Intersection Actions

General infrastructure actions were developed and are shown in Table 6.5. These actions may relate to intersection and roadway departure crash types. Intersection-specific actions also were developed and are shown Table 6.6.



Table 6.5 Infrastructure Actions (General)

Tier 1	
Action 6.5.1:	Implement design treatments to achieve appropriate speeds and manage sight distance consistent with context, users, and community goals.
Co-Benefits	Speeding, Intersections, Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users, Commercial Vehicles
Tier 2	
Action 6.5.2:	Implement targeted infrastructure and striping maintenance programs to address safety issues closely associated with weather, maintenance, or roadway debris that affects travelers.
Co-Benefits	Intersections, Roadway Departure, Bicyclists
Action 6.5.3:	Support multimodal safety considerations during local Transportation System Plan development, and other planning efforts (e.g., local Transportation Safety Action Plans) to guide project planning, operations and maintenance for safer transportation facilities
Co-Benefits:	Intersections, Roadway Departure, Pedestrians, Bicyclists, Data

Table 6.6 Intersection Actions

Tier 1	
Action 6.6.1:	Implement low-cost systemic safety improvements at intersections.
Co-Benefits	Motorcycles, Pedestrians, Bicyclists, Older Road Users, Commercial Vehicles, Young Drivers
Tier 2	
Action 6.6.2:	Implement intersection design treatments to reduce conflicts between users and improve driver awareness of the next intersection and compliance with traffic controls.
Co-Benefits	Motorcycles, Pedestrians, Bicyclists, Older Road Users, Commercial Vehicles
Action 6.6.3:	Implement access management on high-volume roads and/or around complex intersections to reduce crashes.
Co-Benefits:	Motorcycles, Pedestrians, Bicyclists, Older Road Users, Commercial Vehicles

Roadway Departure

When operating a vehicle, an event may arise requiring the driver to swerve suddenly to avoid another car or object; or an unsafe speed could affect control of the car. All of these impact a driver’s ability to stay on the road, possibly resulting in a crash. Roadway departure crashes are defined as non-intersection crashes involving a vehicle departing its lane and running off the road, into a median or into an opposing lane of traffic.

Problem Overview

Between 2009 and 2013 approximately 53 percent of all fatal and serious injury crashes in Oregon included a roadway departure, contributing to 1,188 fatalities and 3,745 serious injuries. About 73 percent of these crashes were in a rural environment. Many risky behavior-related crashes involve the vehicle leaving the lane or entire roadway. For example, lane departure accounts for 44 percent of aggressive driving fatal and serious injuries, 43 percent of speed-related fatal and serious injuries, and 18 percent of impaired driving fatal and serious injuries.



Figure 6.11 Roadway Departure Fatalities and Serious Injuries by Year
2009 to 2013

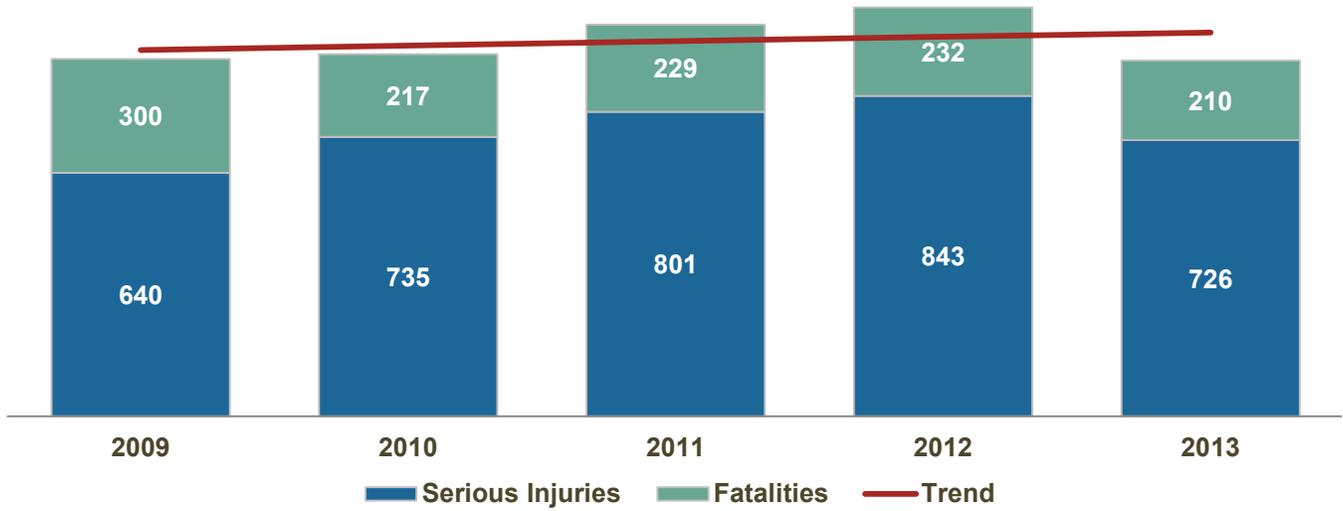
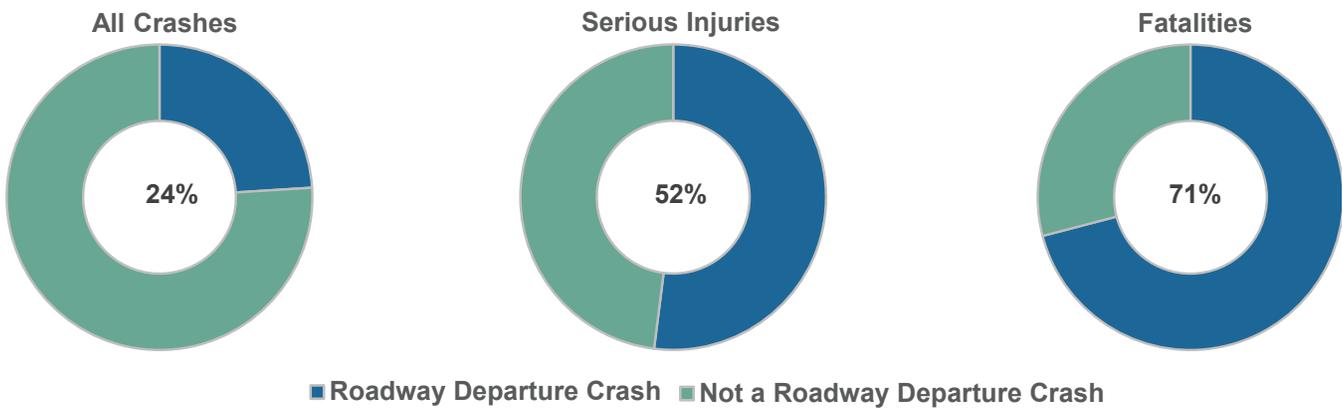


Figure 6.12 Roadway Departure as a Percentage of All Crashes, Serious Injuries, and Fatalities





Roadway Departure Actions

Table 6.7 Roadway Departure Actions

Tier 1	
Action 6.7.1:	Design and implement treatments addressing risk factors associated with roadway departure crashes.
Co-Benefits	Impaired Driving, Speeding, Unrestrained Occupants, Distracted Driving, Motorcycles, Older Road Users, Commercial Vehicles, Data
Tier 2	
Action 6.7.2:	Implement low-cost systemic safety roadway improvements.
Co-Benefits	Impaired Driving, Speeding, Unrestrained Occupants, Distracted Driving, Motorcycles, Older Road Users, Commercial Vehicles
Action 6.7.3:	Improve road delineation to improve the visibility of road edges in rural areas.
Co-Benefits:	Impaired Driving, Speeding, Unrestrained Occupants, Distracted Driving, Motorcycles, Pedestrians, Bicyclists, Older Road Users, Commercial Vehicles

Emphasis Area: Vulnerable Users

Pedestrians

Pedestrian fatalities and serious injuries can be caused by inattentive drivers or inattentive pedestrians. Regardless of who is at fault, crashes involving a pedestrian tend to be more serious because pedestrians are completely exposed when using the transportation system. Nationally, as well as in Oregon, urban areas are working to create healthy communities and lifestyles. Alternative transportation infrastructure, including sidewalks, is being implemented to encourage residents to walk to work, to run errands, or for recreation. An increase in these environments has encouraged more people to walk, but it also has increased the chances for pedestrian/vehicle conflicts. In addition, some communities do not yet have adequate infrastructure in place to accommodate pedestrians, which can also be a risk factor for crashes. In Oregon, pedestrian crashes are defined as crashes where one or more pedestrian was involved in the crash.

Problem Identification

Between 2009 and 2013, crashes involving pedestrians accounted for 10 percent of all the fatal and serious injury crashes in Oregon and contributed to 262 fatalities and 548 serious injuries. Nearly 90 percent of these crashes occurred in an urban environment, where there are more pedestrians and sidewalk infrastructure. In 2015 in Portland, approximately 27 percent of transportation related fatalities were pedestrians (10 of 37 fatalities). Nationally, pedestrians make up 14 percent of all traffic fatalities.²⁸

Crashes at intersections or when alcohol and/or other drugs are involved also are strongly correlated to pedestrian crashes.

²⁸ 2015 Portland Traffic Safety Report, Portland Bureau of Transportation, Active Transportation and Safety Division, pages 3 and 4, February 8, 2016.



Figure 6.13 Pedestrian Fatalities and Serious Injuries by Year
2009 to 2013

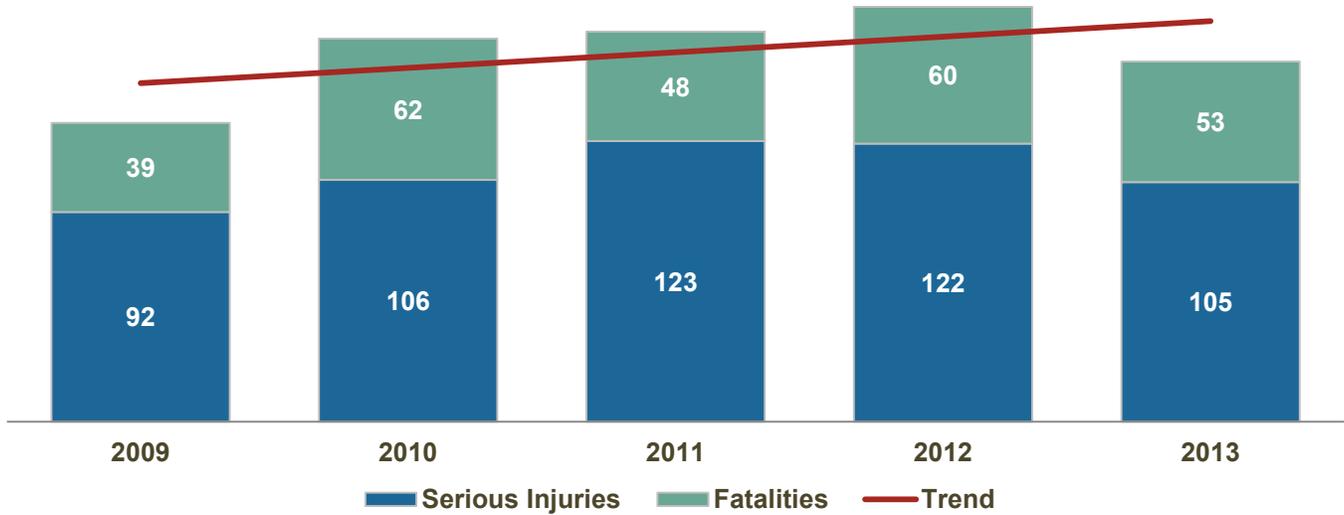
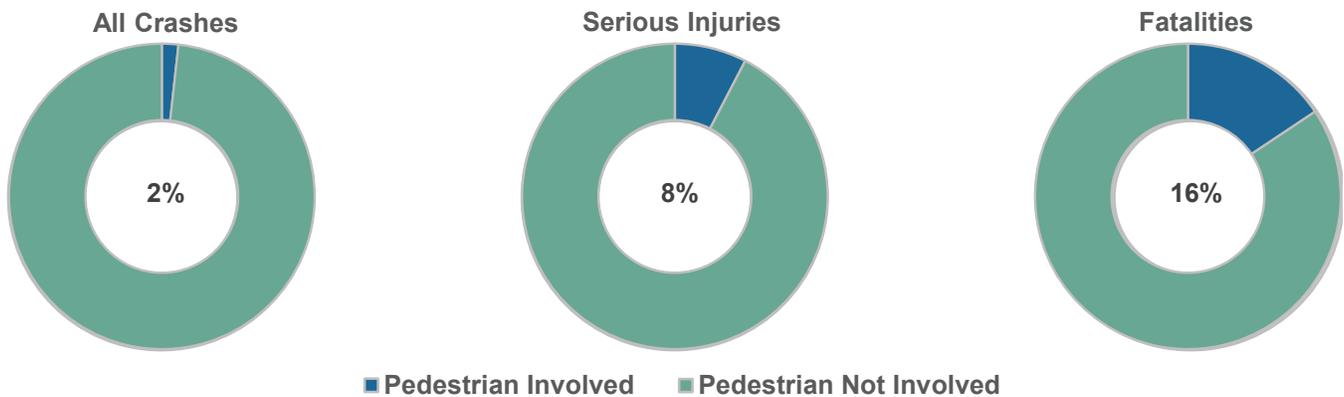


Figure 6.14 Pedestrian Involvement in All Crashes, Serious Injuries, and Fatalities



Pedestrian Actions

Table 6.8 Pedestrian Actions

Tier 1	
Action 6.8.1:	Evaluate the safety performance of innovative pedestrian facilities. Continue implementing the most effective. Co-Benefits: Intersections, Data
Action 6.8.2:	Provide safe facilities and crossings in areas where pedestrians are present or access is needed. Prioritize transit corridors, school areas, multilane streets and highways and other high risk areas and facilities. Co-Benefits: Intersections, Bicyclists, Data
Action 6.8.3:	Improve maintenance of existing pedestrian facilities. Co-Benefits: Intersections



Motorcycles

Motorcycle drivers and passengers are vulnerable because of their level of exposure when traveling on Oregon's roads. When a motorcycle runs off the road or interacts with another vehicle, the lack of protection for the motorcycle driver (and passenger if present) can increase the severity of the crash. A motorcycle crash is defined as a crash that involves a motorcycle, but does not necessarily mean the motorcycle driver is the cause of the crash.

Problem Identification

Between 2009 and 2013, motorcycle crashes accounted for 15 percent of all the fatal and serious injury crashes in Oregon and contributed to 211 fatalities and 1,030 serious injuries. About 56 percent of these crashes occurred in a rural environment. A large number of motorcycle fatal and serious injury crashes (61 percent) result from lane departure crashes. Crashes at intersections (46 percent) and aggressive driving (42 percent) also are strongly correlated to motorcycle crashes.

Figure 6.15 Motorcycle Driver and Passenger Involved Fatalities and Serious Injuries by Year 2009 to 2013

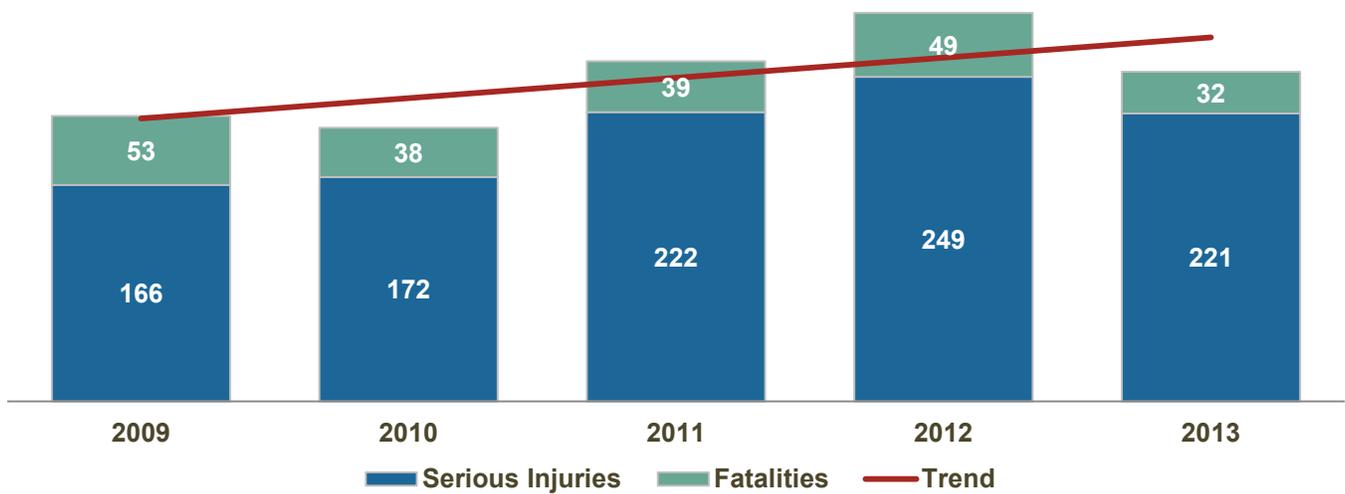
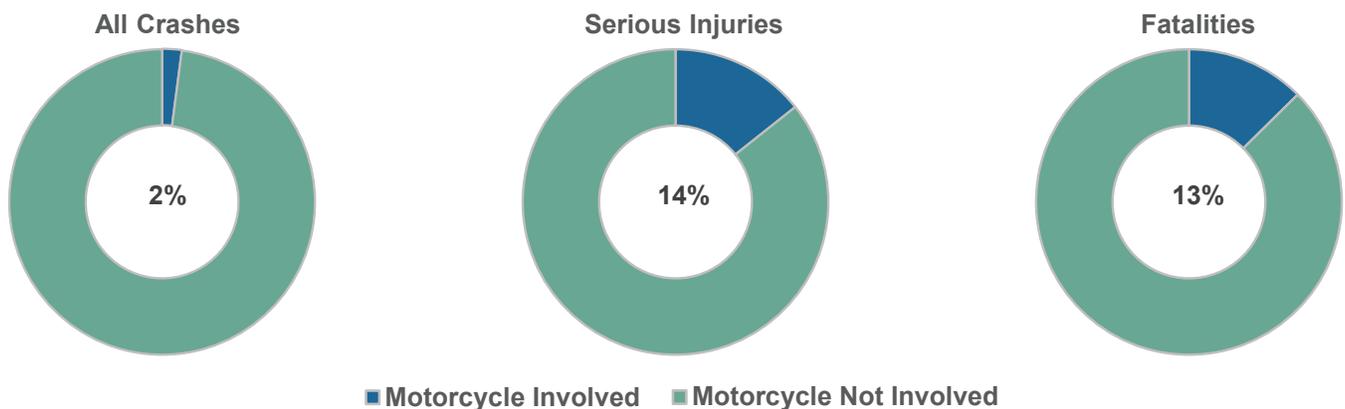


Figure 6.16 Motorcycle Involvement in All Crashes, Serious Injuries, and Fatalities





Motorcyclist Actions

Table 6.9 Motorcycle Actions

Tier 1	
Action 6.9.1:	Increase awareness among motorcycle drivers that the majority of crashes involve speed, impairment, and roadway departure. Co-Benefits: Speed, Impaired Driving
Action 6.9.2:	Provide education and enforcement to decrease impaired motorcycle riding. Co-Benefits: Impaired Driving, Training, Enforcement
Tier 2	
Action 6.9.3:	Increase awareness of motorcycles among the general public through education and outreach. Co-Benefits: Impaired Driving, Speeding, Roadway Departure
Action 6.9.4:	Adopt and implement road surface maintenance practices across jurisdictions that reduce hazards for people operating motorcycles. Co-Benefits: Road departure
Action 6.9.5:	Modify Oregon’s helmet definition to match Federal regulations. Co-Benefits: –

Bicyclists

Bicycle fatalities and serious injuries can be caused by inattentive drivers or inattentive bicyclists.

Regardless of who is at fault, crashes involving a bicyclist tend to be more serious because bicyclists are completely exposed when using the transportation system. Nationally, as well as in Oregon, urban areas are developing transportation systems and land use policies to promote healthy communities and lifestyles. Alternative transportation infrastructure, including bike lanes, bike-specific traffic signals, and bike racks, are being implemented to encourage residents to bike to work, run errands, or for recreation. In the City of Portland, 7.2 percent of commuters go by bike, which is the highest percentage of commuters for a large American city.²⁹ As bicycling environments improve and more people ride bikes, there are more chances for bicycle-vehicle conflicts. In Oregon, bicycle crashes are defined as crashes where one or more bicyclists (or other pedalcyclists) was/were involved in the crash.

Problem Identification

Between 2009 and 2013, crashes involving bicyclists (pedalcyclists) accounted for 4 percent of all the fatal and serious injury crashes in Oregon and contributed to 42 fatalities and 293 serious injuries. About 86 percent of these crashes occurred in an urban environment, where there are more bicyclists and bicycle infrastructure. A number of bicycle-related fatal and serious injury crashes result from young driver crashes. Older driver crashes and crashes when aggressive driving is involved are also strongly correlated to bicycle crashes.

²⁹ <https://www.portlandoregon.gov/transportation/article/407660>.



Figure 6.17 Bicyclist Fatalities and Serious Injuries by Year
2009 to 2013

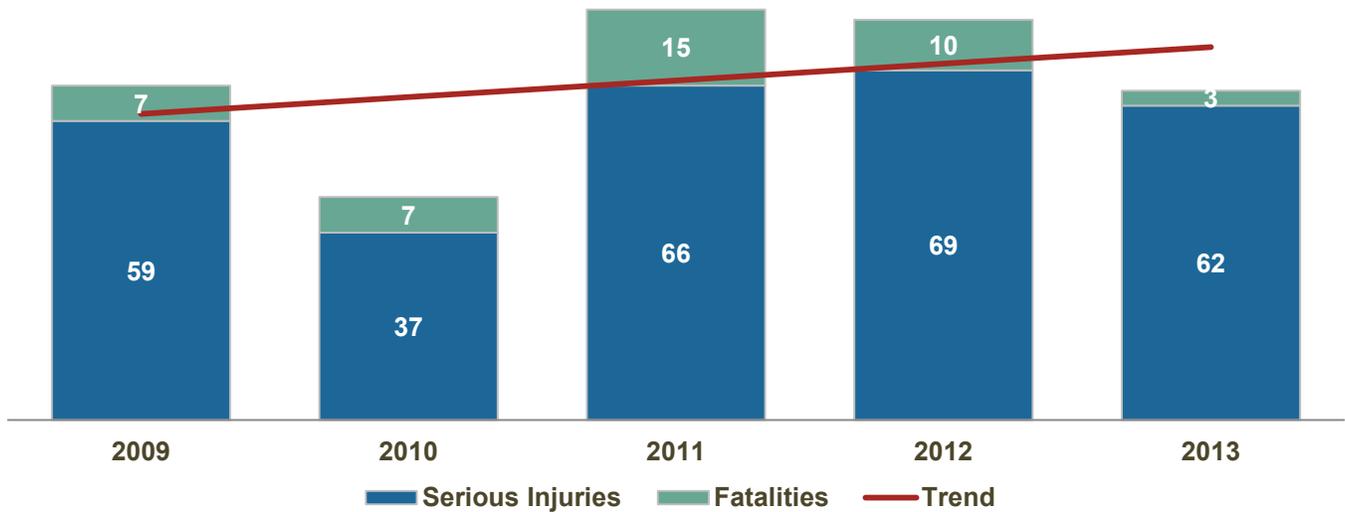


Figure 6.18 Bicyclist Involvement in All Crashes, Serious Injuries, and Fatalities



Bicyclist Actions

Table 6.10 Bicyclist Actions

Tier 1	
Action 6.10.1:	Evaluate the safety impacts of innovative bicycle facilities. Continue implementing the most effective.
Co-Benefits	Intersections, Data
Tier 2	
Action 6.10.2:	Adopt and implement road surface maintenance practices across jurisdictions that reduce hazards for people riding bicycles.
Co-Benefits	Motorcycles
Action 6.10.3:	Provide youth safety items (e.g., bicycle helmets) to satisfy public demand.
Co-Benefits:	Intersections, Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users



Older Drivers and Pedestrians

While older drivers are a concern now in Oregon, crash numbers could increase dramatically over the next decade as the U.S. population ages. Operating a vehicle requires drivers to react quickly, see and hear clearly, judge distances and speeds, and be aware of other drivers and road users. As people age, it can lead to a decline in some of these abilities. When older drivers do crash, it also tends to be more severe as they can get hurt more seriously and face longer recovery times than younger drivers. In Oregon, older driver crashes are defined as crashes where drivers older than 65 are involved in, but not necessarily the cause of, a crash (Figure 6.19). As a subset of older driver involved crashes, older pedestrian fatalities and serious injuries also are a concern for many of the same reasons listed above –reaction time to oncoming vehicles may be slower, they may not be able to see crosswalks or automobiles as well, they may misjudge the amount of time required to cross a street or otherwise be less aware of their surroundings (Figure 6.21). In addition, when older pedestrians are struck by a vehicle, their injuries tend to be more severe.

Problem Identification

Between 2009 and 2013, older driver involved crashes accounted for 13 percent of all the fatal and serious injury crashes in Oregon and contributed to 352 fatalities and 1,396 serious injuries (Figure 6.19). Approximately 50 percent of these crashes occurred in an urban environment. A large number of older driver fatal and serious injury crashes (44 percent) result from lane departure crashes. Crashes at intersections (40 percent) and aggressive driving (26 percent) also are strongly correlated to older driver crashes.

Figure 6.19 Older Driver Involved Fatalities and Serious Injuries by Year
2009 to 2013

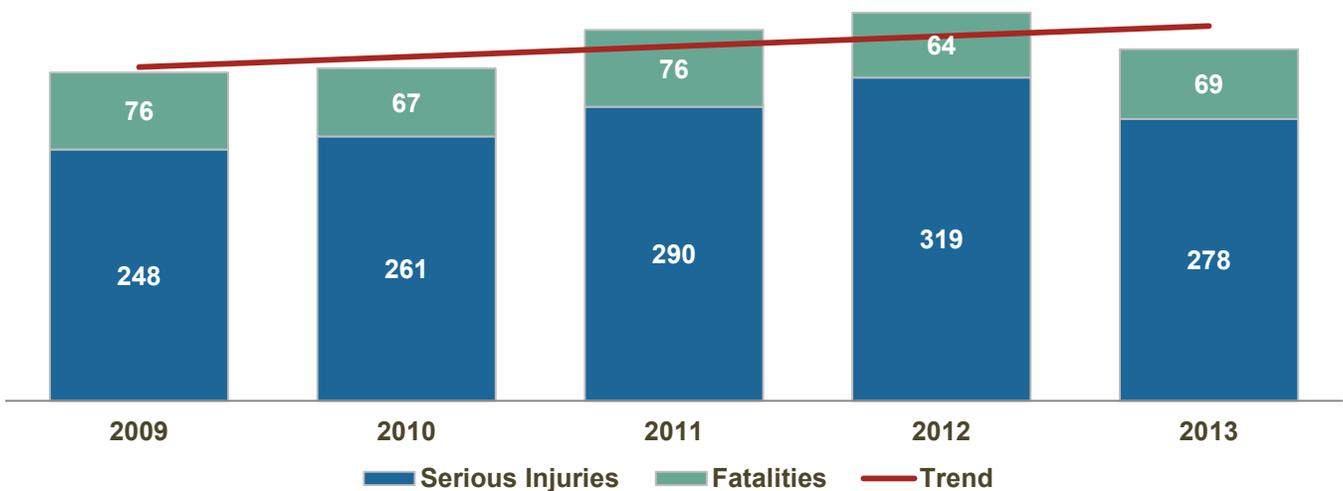




Figure 6.20 Older Driver Involvement in All Crashes, Serious Injuries, and Fatalities

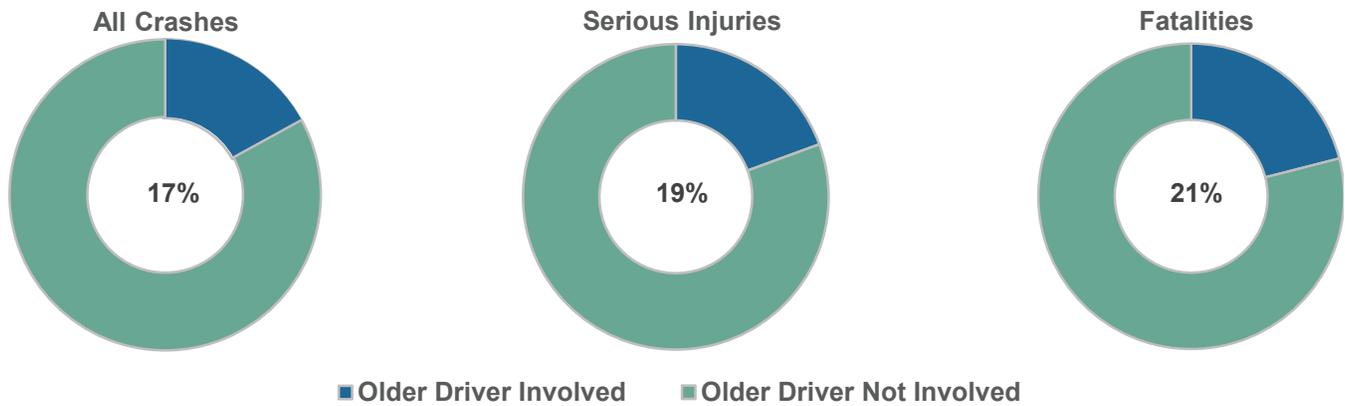
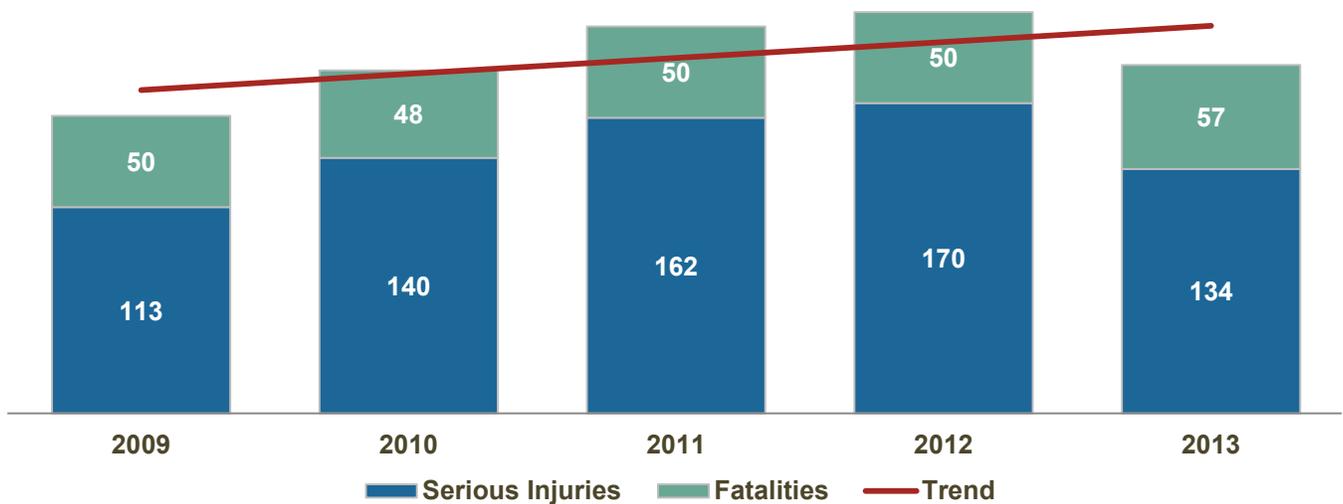


Figure 6.21 Older Driver and Pedestrian Fatalities and Serious Injuries by Year 2009 to 2013



General vulnerable user actions were developed and are shown in Table 6.11. These actions relate to all vulnerable road users, not just older drivers and pedestrians. Older road user-specific actions also were developed and are shown Table 6.12.

Table 6.11 Vulnerable User Actions (General)

Tier 2	
Action 6.11.1:	Conduct education campaigns to encourage all system users to recognize responsibility for the safety of all travelers (e.g., share the road, slow down for kids).
Co-Benefits	Speeding, Intersections, Motorcycles, Pedestrians, Bicyclists
Action 6.11.2:	Evaluate the need for actions which address the issues associated with children and adolescents, and young vehicle operators.
Co-Benefits:	Intersections, Roadway Departures, Impaired Driving, Speeding, Unrestrained Occupants, Distracted Driving



Table 6.12 Older Road Users Actions

Tier 1		
Action 6.12.1:	Identify risk factors for older drivers and implement treatments, within current law.	
	Co-Benefits	Data

Tier 2		
Action 6.12.2:	Identify risk factors for older walkers and implement treatments, within current law.	
	Co-Benefits	Pedestrians, Data

Emphasis Area: Improved Systems

Five additional subareas were identified as vital components to achieving the zero fatalities and serious injuries vision. To positively influence crash outcomes in Oregon, it is necessary to invest in data improvements to better identify crash locations and understand contributing factors; provide training to transportation and safety stakeholders to expand implementation of safety efforts; coordinate with law enforcement and emergency responders on opportunities to reduce the severity of crash outcomes; and address the consequences of commercial vehicle crashes.

Commercial Vehicles

The Motor Carrier Safety Division at ODOT develops an annual Commercial Vehicle Safety Plan. The mission of the Motor Carrier Transportation Division is to promote a safe, responsible, and efficient commercial transportation industry in Oregon.³⁰ Similar to the TSAP, the plan outline critical state commercial vehicle issues, potential solutions and performance measures. There also are Federal guidelines documented in the plan.

Actions

Table 6.13 Commercial Vehicle Actions

Tier 1		
Action 6.13.1:	Implement the annual Commercial Motor Vehicle Safety Plan.	
	Co-Benefits	N/A

Enforcement

Law enforcement officials prevent crashes through traffic details, special mobilization campaigns such as Click It or Ticket, saturation patrols, and checkpoints. These different approaches enable officers to prosecute safety offenses, such as impaired driving and distracted driving, but also keep all road users safe at the same time.

They also respond to crashes when they do occur to collect information for a crash report, which details the specifics of the crash, person(s), and vehicle(s), involved in the incident. This information later helps transportation and safety stakeholders make informed decisions about safety solutions. Fully staffed and funded law enforcement agencies can direct their efforts towards targeted enforcement and data collection.

³⁰ Summary of Oregon Truck Safety and Guide to the 2015 Commercial Vehicle Safety Plan. <https://www.oregon.gov/ODOT/MCT/docs/CVSPlan2015.pdf>.



Actions

Table 6.14 Enforcement Actions

Tier 1	
Action 6.14.1:	Equitably enforce and prosecute traffic safety offenses for all modes.
Co-Benefits	Impaired Driving, Speeding, Unrestrained Occupants, Distracted Driving, Motorcycles, Pedestrians, Bicyclists and Older Road Users
Action 6.14.2:	Increase funding for traffic patrols to enforce traffic laws.
Co-Benefits:	Impaired Driving, Speeding, Unrestrained Occupants, Distracted Driving

Emergency Medical Services

Emergency medical service providers are the people responding to victims at crash scenes. Having a prompt and effective EMS system can increase the survival rates for crash victims, especially in rural areas where longer travel distances can make the difference between life and death. The primary responsibility for EMS staff are to triage, treat, and transport crash victims, but they also may coordinate evacuation with other agencies, provide advanced emergency medical care, and determine the cause of injuries for the trauma center. Fully staffed, funded, and trained emergency response teams can provide services that save lives and/or reduce the impact of injuries.

Actions

Table 6.15 EMS Actions

Tier 1	
Action 6.15.1:	Recruit, train, and retain EMS responders in urban, rural, and sparsely populated areas.
Co-Benefits	Impaired Driving, Speeding, Unrestrained Occupants, Distracted Driving, Intersections, Roadway Departure, Motorcycles, Pedestrians, Bicyclists, Older Road Users, Training
Tier 2	
Action 6.15.2:	Promote Traffic Incident Management (TIM) Responder Training for EMS officials in rural and sparsely populated areas.
Co-Benefits	Training
Action 6.15.3:	Conduct annual trauma symposium for EMS providers.
Co-Benefits:	Training
Action 6.15.4:	Address EMS equipment shortfalls through increased funding.
Co-Benefits:	All users

Data

Crash, roadway, and volume (motor vehicle, pedestrian, and bicycle) data is essential to understanding crash trends, identifying critical issues, developing emphasis areas and actions, and evaluating the effectiveness of solutions. Data should be timely, accurate, complete, consistent, integrated, and accessible. The improvement of data is addressed by the Oregon Traffic Records Coordinating Committee and other interested stakeholders. Moving forward, a priority of this group will be to develop and implement a Traffic Records Strategic Plan to ensure that the best available data is used for safety planning and investment decisions.



Actions

Table 6.16 Data Actions

Tier 1	
Action 6.16.1:	Evaluate pedestrian and bicycle high crash locations and risk factors through analysis of existing data and development of new data sources. Co-Benefits: Pedestrians, Bicyclists
Action 6.16.2:	Improve timeliness of crash data. Co-Benefits: N/A
Action 6.16.3:	Improve reliability of crash reports. Co-Benefits: Distracted Driving
Action 6.16.4:	Identify data needs related to impaired driving and implement measures to address gaps. Coordinate with public health. Co-Benefits: Impaired Driving
Action 6.16.5:	Develop and implement a new Traffic Records Strategic Plan based on the 2016, and subsequent future assessments of the traffic records system. Co-Benefits: N/A
Tier 2	
Action 6.16.6:	Evaluate type and extent of crash underreporting. Implement necessary actions to address issue. Co-Benefits: N/A

Training and Education

Oregon is committed to educating engineers, educators, enforcement, emergency service providers, and the general public about new safety information and offering training opportunities to maintain and upgrade skills. Continued driver education and training, for young and experienced drivers including motorcycle drivers, will contribute to crash reductions. Specific education and training opportunities would contribute to a better understanding of traffic laws, new transportation infrastructure, work zone awareness, and motorcycle safety.

Actions

Table 6.17 Training and Education Actions

Tier 1	
Action 6.17.1:	Implement education and training related to new types of infrastructure (e.g., signal heads, safety edge, crosswalks, bike lanes, or roundabouts) and related traffic laws. Co-Benefits: Intersections
Action 6.17.2:	Encourage and support local planning for safety efforts, the formation of local government commissions and committees, and other affiliated groups that address transportation safety. Co-Benefits: All modes
Action 6.17.3:	Implement education, training or examinations to ensure licensed drivers understand current traffic laws. Co-Benefits: Motorcycles, Pedestrians, Bicyclists, Older Road Users, Commercial Vehicles



Tier 2	
Action 6.17.4:	Conduct training and education to reduce the number of unendorsed travelers (all modes). Co-Benefits: Motorcycles, Pedestrians, Bicyclists, Older Road Users, Commercial Vehicles
Action 6.17.5:	Conduct training on traffic safety laws for law enforcement officers, attorneys and judges to improve consistent enforcement and adjudication processes. Co-Benefits: Enforcement
Action 6.17.6:	Provide continued improvement of the education system for new drivers, including issues dealing with access to, and cost associated with passenger vehicle operator training. Evaluate requiring driver training for youthful operators. Co-Benefits: Intersections, Roadway Departures, Impaired Driving, Speeding, Unrestrained Occupants, Distracted Driving, Motorcycles, Pedestrians, Bicyclists
Action 6.17.7:	Provide education and other countermeasures to ensure safe work zones around roadway construction and improvement projects for workers and the traveling public. Co-Benefits: Intersections, Roadway Departures, Impaired Driving, Speeding, Distracted Driving, Older Road Users
Action 6.17.8:	Provide support for use of comprehensive, integrated approaches such as 4 Es to those who design, operate, maintain, and use the system. Extend efforts to all agencies and partners through education and other measures. Co-Benefits: Enforcement, Emergency Response, Intersections, Roadway Departures

CONCLUSION

EAs represent the key factors contributing to crashes. In Oregon, the results of data analysis and public input identified Infrastructure, Risky Behaviors, Vulnerable Users, and Improved Systems as the priority areas to focus staff time and resources to achieve reductions in transportation-related fatalities and serious injuries. To effectively direct resources over the next five years, project and programmatic measures, and potential future legal or policy changes have been identified to be implemented by a variety of Oregon's agencies and stakeholders.