DISCUSSION DRAFT

2018 Regional Transportation Plan

Regional Transportation Safety Strategy

A strategy to achieve Vision Zero in the greater Portland region

March 20, 2018

oregonmetro.gov/safety

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Regional Transportation Plan website: **oregonmetro.gov/rtp**
Regional Transportation Safety Strategy web site: **oregonmetro.gov/safety**

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Increasing pedestrian safety is a central focus of the Regional Transportation Safety Strategy
Source: Metro, Hwy 99W

FOREWORD

The 2018 Regional Transportation Safety Strategy ("Regional Safety Strategy") updates the region's first Regional Transportation Safety Plan, which was completed in 2012. The Regional Safety Strategy is a topical plan of the Regional Transportation Plan and updates regional safety goals, objectives, policies, targets and performance measures.

With the federal Transportation Equity Act for the 21sr Century (TEA-21) in 1998, safety and security appeared as planning factors for metropolitan planning organizations to address in transportation planning. The Safe, Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU), adopted in 2005, placed a greater emphasis on addressing safety and established the Highway Safety Improvement Program (HSIP) as a core Federal-aid program. Signed into law 2012, the Moving Ahead for Progress in the 21sr century Act (MAP-21) required States and metropolitan planning organizations to adopt safety performance measures and targets. This requirement was maintained in the most recent federal surface transportation legislation the Fixing America's Surface Transportation Act (FAST Act), signed into law in 2015.

The Regional Safety Strategy was developed by a regional transportation safety technical work group as part of the update of the 2018 Regional Transportation Plan. The Joint Policy Advisory Committee on Transportation (JPACT), the Metro Policy Advisory Committee (MPAC), the Transportation Policy Alternatives Committee (TPAC) and the Metro Technical Advisory Committee (MTAC) provided policy and technical guidance. Development of the Regional Safety Strategy was informed by state, county and city transportation safety action plans.

The purpose of the Regional Safety Strategy is to provide a specifically urban-focused overarching data-driven framework for increasing traffic safety in the greater Portland region. The plan focuses on strategies and actions drawn from best-practices and proven to reduce traffic related deaths and serious injuries.

The Regional Safety Strategy does not mandate adoption or implementation of the safety strategies and actions described in the plan; transportation elements required to be included in local transportation system plans are listed in the Regional Transportation Functional Plan.

23 U.S. Code 409 states that crash and safety data, including reports, surveys, schedules, and lists, compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing federal-aid highway funds, shall not be subject to discovery or admitted into evidence in a federal or state court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

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Designing for safety supports equity, human and environmental health, air quality, and economic prosperity
Photo: Metro

EXECUTIVE SUMMARY

Traffic related deaths and severe injuries are a critical and preventable public health and social equity issue in the greater Portland region. Between 2011 and 2015, there were more than 116,000 traffic crashes resulting in 311 deaths and 2,102 people severely injured.[1]

Traffic crashes are the leading cause of unintentional injury death for young people ages 5 to 24 in Multnomah, Washington and Clackamas County, and the second leading cause of unintentional injury death for people ages 25 to 84.[2]

On average, 62 people die each year on the region's roadways and 420 people experience a life changing injury. Nearly two people are either killed or severely injured every day in our region in a traffic crash; every 10 days a person riding a bike is killed or severely injured; every 5 days a person walking is killed or severely injured.

Sixty percent of these fatal and severe injury crashes occur on just 6 percent of the region's major streets. These roadways are identified in this document as Regional High Injury Corridors and Intersections. They are also where we tend to travel the most, where we run to catch the bus, cross the street to get to schools and shops, ride our bikes or drive.

Top three findings

The Regional Transportation Safety Strategy identifies three top findings to that must be addressed to make daily travel safer for all people, whether driving, walking, bicycling or taking transit.

Traffic deaths are increasing and are disproportionately impacting people of color, people with low incomes and people over age 65

- Serious crashes (fatal and severe injury crashes combined) have fluctuated since 2007, but more recently have been increasing. Initial data from 2016, 2017 and 2018 indicate that the trend is continuing. This is a trend that is also happening at the state and national levels.
- The regional annual fatality rate by population and vehicle miles traveled (for 2011-2015) has increased compared to the 2012 Metro State of Safety Report.[3]
- Your risk of dying in a motor-vehicle involved crash is higher if you are a person of color, are over 65 or have a lower income.[4]

[1] 2018 Metro State of Safety Report ~ unless otherwise noted, all crash data findings are from the 2018Metro State of Safety Report

[2] Oregon Death Certificates: Center for Health Statistics, Center for Public Health Practice, Public Health Division, Oregon Health Authority. Accessed March 13, 2018. For 2012-2016. Unintentional injuries were the 4th leading cause of death (just about tied for third with cerebrovascular disease/stroke); within the category of unintentional injury deaths, transport injuries are the third leading cause behind falls and poisoning (poisoning includes drug overdoses).

[3] Fatality rates for traffic related crashes are the proportion of all crashes, person deaths or severe injuries for every 1 million people or every 100 million vehicle miles traveled.

- A majority of Regional High Injury Corridors are in communities with higher densities of people of color, people with low incomes and English language learners.[5]
- A majority of pedestrian deaths are in are in communities with higher densities of people of color, people with low incomes and English language learners.
- Older drivers are twice as likely to die in a traffic crash. For male drivers age 70 to 79 and female drivers age 75 to 85 and older the share of serious crashes is double that of drivers in other age groups.
- In Oregon, American Indians/Alaska Natives have the highest average rate of vehicle related deaths (5.9 per 100,000) 1.8 times the rate among whites (3.3 per 100,000), and American Indians/Alaska Natives and Black or African American had the highest hospitalization rate -52.2 and 46.2 per 100,000, compared to 45.5 for whites and 20.8 Asian Pacific Islander for traffic related injuries.[6] This data is not currently available at the regional level.

Traffic deaths are disproportionately impacting people walking

- Auto-only crashes comprise ninety-one percent of all crashes, and thirty-eight percent of all fatal crashes. Pedestrian crashes make up two percent of all crashes, and thirty-six percent of all fatal crashes.
- Pedestrian traffic deaths are steadily increasing, are the most common type of fatal crash, and have the highest severity of any crash type.
- Pedestrian fatalities have steadily increased to 2015 at the local, regional, state and national levels.
- In the region, a pedestrian crash is more than 26 times as likely to be fatal than a crash not involving a pedestrian, and more than 110 times as likely to be fatal as a rear end crash, the most common crash type.
- Roadway design is critical to pedestrian safety. Seventy-seven percent of serious pedestrian crashes occur on arterial roadways in the region. This pattern is seen at the state level as well.

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[4] *Motor Vehicle Traffic-Related Pedestrian Deaths — United States*, *2001–2010*, Centers for Disease Control and Prevention (2013); *Dangerous by Design*, National Complete Streets Coalition (2016); *Income Disparities in Street features that Encourage Walking*, Bridging the Gap (2012); *Pedestrians Dying at Disproportionate Rates in America's Poorer Neighborhoods*, Governing, August 2014; *America's Poorer Neighborhoods Plagued by Pedestrian Deaths*, Governing Research Report (August 2014)

[5] The map at the end of this section shows the overlap of Regional High Injury Corridors and census tracts with both higher than regional average concentration and double the regional density of people of color, people with low income, and/or English language learners.

[6] Oregon Public Health Authority, 2008-2014 crashes

A majority of traffic deaths are occurring on a subset of arterial roadways

- Arterial roadways are the location of the majority of the serious crashes in the region. Sixty-six percent of all serious crashes occur on a roadway designated as an arterial.
- In the region, seventy-three percent of non-freeway serious crashes occur on a roadway designated as an arterial; seventy-seven percent of serious pedestrian crashes occur on a roadway designated as an arterial; sixty-five percent of serious bicycle crashes occur on a roadway designated as an arterial.
- A majority of Regional High Injury Corridors are arterial roadways.
- A majority of the High Injury Corridors and Intersections – and a majority of pedestrian deaths and severe injuries – are in areas with race and income marginalized communities.

The Regional Safety Strategy uses a Safe System approach and identifies effective and proven strategies and actions to address these and other data-driven findings.

Traffic deaths and life changing injuries impact the lives of our families, friends, neighbors and community members. They also have a major economic cost – estimated at $1 billion for our region.

Research sponsored by AAA found that in large urban areas, such as the greater Portland region, costs resulting from crashes are over three times more than congestion. –"Crashes vs. Congestion: What's the Cost to Society?" Cambridge Systematics, 2011

Achieving Vision Zero with a Safe System approach

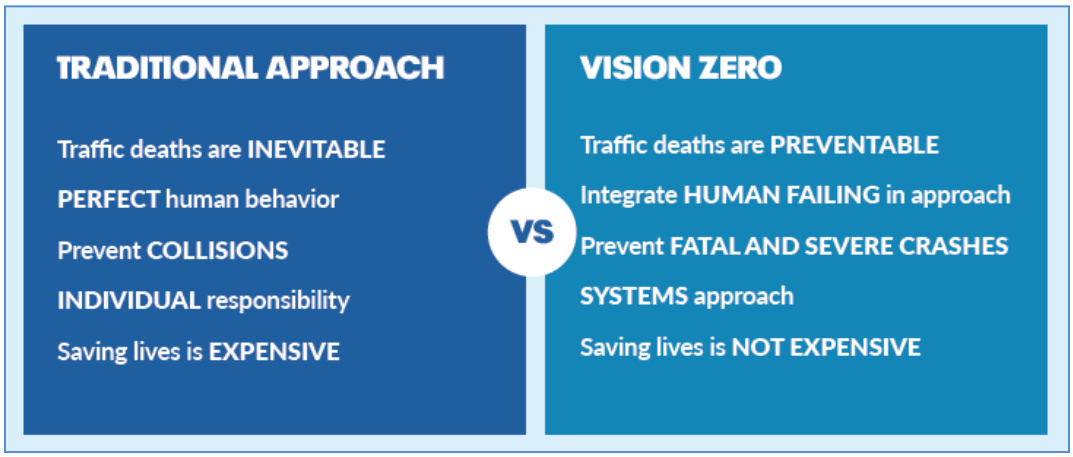
While the greater Portland region has one of the lowest crash rates in the country, our elected and community leaders acknowledge that the high number of tragedies on our roadways is largely predictable and preventable and that no loss of life from a traffic crash is acceptable. They are stepping up to declare that "enough is enough" and to devise plans and policies for a safe future on our roadways. Just as we expect the right to safe water to drink and clean air to breathe, so too should we expect the right to move about safely.

The region is employing a Vision Zero Safe System approach with an adopted goal to eliminate deaths and severe injuries for all users of the transportation system by 2035.

The Safe System approach has been developed and refined over many decades of application. Since it was first introduced, in Europe, it has been taken up at the country, state, and city levels around the world. The system is often branded under a public policy

identity, such as Vision Zero or Toward Zero Deaths, which aims to connect with the public and establish a direct link to the desired outcome. [7]

The Safe System approach involves a holistic view of the transportation system and the interactions among travel speeds, vehicles and road users. It is an inclusive approach that prioritizes safety for all user groups of the transportation system - drivers, motorcyclists, passengers, pedestrians, bicyclists, and commercial and heavy vehicle drivers. Consistent with the region's long-term safety vision, it recognizes that people will always make mistakes and may have road crashes—but the system should be designed so that those crashes should not result in death or serious injury. Design emphasizes separation – between people walking and bicycling and motor-vehicles, access management and median separation of traffic – and survivable speeds.



Vision Zero is a Safe System approach
Source: Vision Zero Network

The Safe System approach focuses on **key guiding principles** that shape how transportation safety is addressed.

1. **No death or serious injury is acceptable** – lack of safety should not be a trade-off for faster mobility. Rather, the transportation system should be both safe and efficient.

2. **Traffic deaths and severe injuries are preventable** - the focus is on fatal and severe injury crashes, not all crashes. This is one of the most important shifts in how traffic safety is perceived and addressed, shifting the focus to how and where people are dying. It helps prioritize and focus efforts to lead to more immediate outcomes.

3. **People make mistakes that can lead to road crashes** – design roadways so that crashes do not result in a serious injury. Safety should focus on systems-level changes above influencing individual behavior.

[7] Sustainable and Safe: A Vision and Guidance for Zero Road Deaths (2017) World Resources Institute and Global Road Safety Facility

4. **Humans are vulnerable to injury** – especially people walking, bicycling, riding motorcycles and working in the right-of- way, and we must operate our transportation system to avoid serious injury.

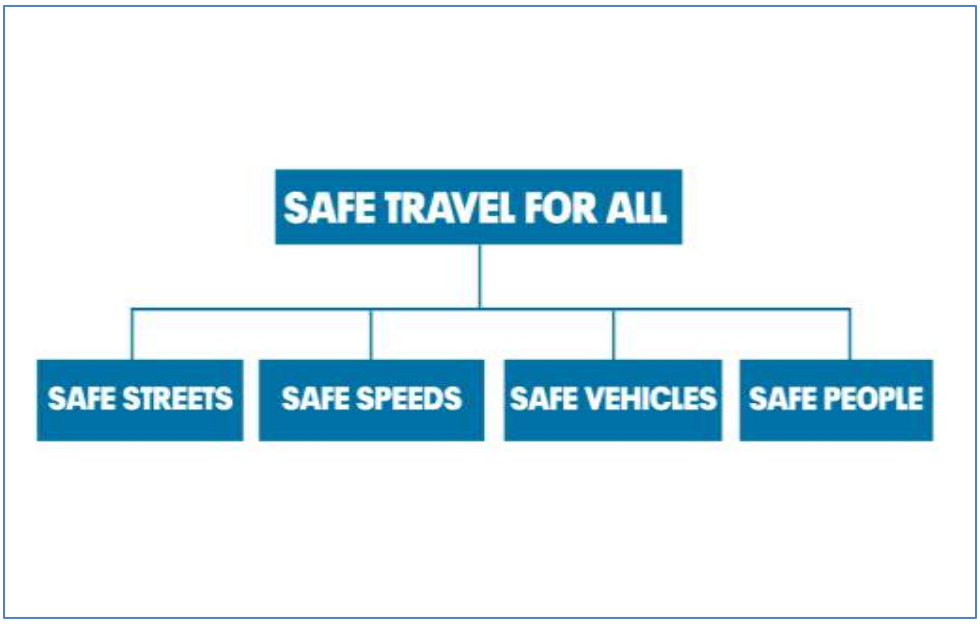
5. **Responsibility is shared** – the people that design, build, manage, and use roadways and vehicles and provide post-crash care have a shared responsibility to prevent severe injuries and deaths.

6. **Proactive versus reactive actions** – rather than waiting for events to occur and reacting, a proactive approach should be taken to make the transportation system safe, systemically addressing risk. All parts of the system must be strengthened so that if one part fails road users are still protected.

7. **Data driven decision making**- use data, research and evaluation to understand crashes and risks and to guide decision making.

The Safe System approach provides a framework for strategies and actions that starts with safe travel for all, including reducing disparities for people of color and people with low incomes and for people walking and bicycling. It focuses on proven and effective strategies that create safe streets, safe speeds, safe vehicle and safe people.

Governments are increasingly using the Safe System approach because it is proving to be effective in the countries where it has been in place for decades. Many countries, states, and cities that have adopted a Safe System approach have reduced road fatalities at a faster rate than others that followed the traditional approach.[8]



Vision Zero Safe System Approach
Source: Vision Zero Network

[8] Sustainable and Safe: A Vision and Guidance for Zero Road Deaths (2017) World Resources Institute and Global Road Safety Facility

Six data-driven strategies

The Regional Transportation Safety Strategy identifies six strategies and fifty-three actions to address findings from analysis of 2011-2015 crash data. Strategies and actions with proven effectiveness were prioritized. Actions for each strategy can be found in Chapter 4.

1 Protect vulnerable users and reduce disparities[9]

Vulnerable users have higher fatality rates. Increasing safety for vulnerable users increases safety for all transportation users and reduces disparities.

2 Design roadways for safety

Arterial roadways have the highest serious crash rate per road mile and per vehicle mile traveled. Prioritizing and standardizing safety in street design for all modes can prevent dangerous behaviors and save lives.

3 Reduce speeds and speeding

Speed is a fundamental contributing factor in crash severity. Reducing speeds and speeding saves lives.

4 Address aggressive and distracted driving

Dangerous behaviors include those that arise from aggressive or distracted driving and can lead in an instant to injury or death. Policies and roadway design can reduce the likelihood of and minimize the impact of bad decisions.

5 Address impairment

Crashes involving alcohol and drugs have a much higher likelihood of being fatal than other crashes. Providing options to people using the roadways while drunk or intoxicated saves lives.

6 Ongoing engagement and coordination

Many partners are needed to implement Vision Zero. Ongoing engagement and coordination among all partners is essential.

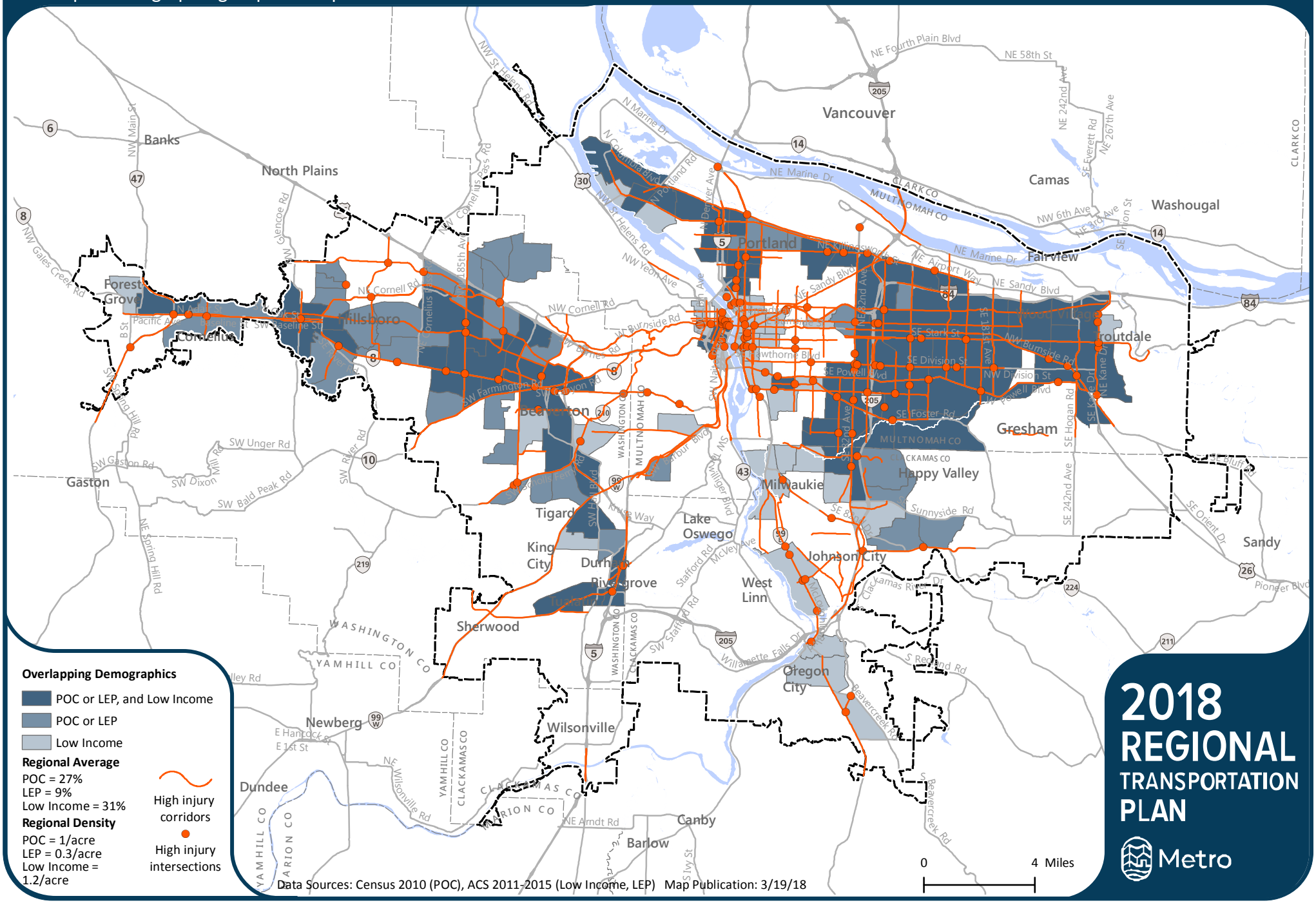
Reaching towards Vision Zero will be a challenge, but not impossible

Vision Zero is an ambitious goal but one the region must strive for. With coordinated effort, proven strategies and focused investments the region can move towards Vision Zero. Safety projects in the 2018 Regional Transportation Plan and on the region's High Injury Corridors and Intersections will make it safer to walk, catch the bus, drive, and ride a bicycle or motorcycle. They will address streets with high risk characteristics and prevent crashes from happening. Programs will educate and inform people on safer behaviors and connect people with travel options that reduce driving, thereby reducing exposure to traffic crashes.

[9] Vulnerable users are people that are more vulnerable to being killed or seriously injured in crashes. Vulnerable users are pedestrians, bicyclists, motorcycle operators, children, older adults, road construction workers, people with disabilities, people of color and people with low income

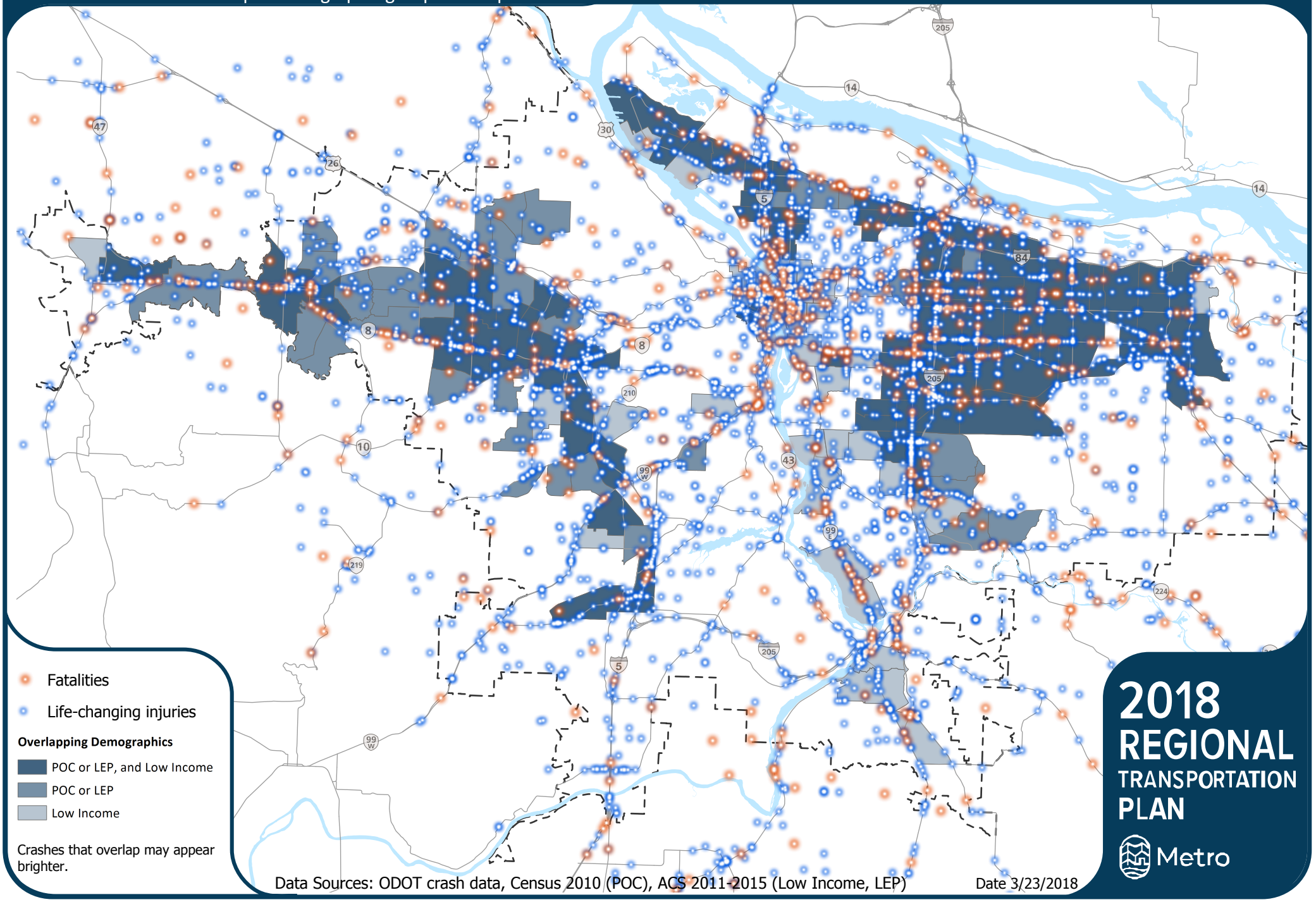
High Injury Corridors Overlapping Communities of Color, English Language Learners, and Lower-Income Communities

This map shows the overlap of regional high injury corridors and road intersections with census tracts with higher than regional average concentrations and double the density of one or more of the following: people of color, people with low income, and English language learners. Census tracts where multiple demographic groups overlap are identified.



Fatal and Serious Crashes Overlapping Communities of Color, English Language Learners, and Lower-Income Communities

This map shows the overlap of fatal and life changing crashes involving people driving, biking and walking with census tracts with higher than regional average concentrations and double the density of one or more of the following: people of color, people with low income, and English language learners. Census tracts where multiple demographic groups overlap are identified.



WE REMEMBER

Your stories inspire us to take serious action.

The Regional Transportation Safety Strategy is dedicated to the victims of traffic violence in the Portland region—the daughters, sons, mothers, fathers, wives, husbands, siblings, and friends who have been killed or severely injured on our streets.

Oregon and SW Washington Families for Safe Streets is comprised of victims of traffic violence and families whose loved ones have been killed or severely injured by aggressive or reckless driving and dangerous roadway conditions in Oregon and SW Washington. The group is modeled after the original Families for Safe Streets group banded together in New York City in 2014. With stories and advocacy, Oregon and SW Washington Families for Safe Streets seek cultural and physical changes on streets and the rapid implementation of Vision Zero. Oregon and SW Washington Families for Safe Streets envision communities where pedestrians, bicyclists and vehicles safely co-exist, and children and adults can travel freely without risk of harm – where no loss of life in traffic is acceptable.

Community member story

Community member story

Community member story

Community member story

On December 28, 2005, my neighbor Peilian Wu was killed crossing NW Walker Road (at NW 180th Ave) to get to the bus stop that we both used. I felt great grief for her and her family, and astonished grief as a fellow pedestrian. Fei Fei and Dong Dung lost their grandmother who they lived live within a three generation household. Her fellow employees lost an infectious cheerful co-worker, I lost a dynamic good neighbor, and we lost a valued community member. It took me three years before I mustered the courage to cross the road to use that bus stop again or to walk to the local park and stores.

One death or fatal injury by vehicle crashes is one death too many. We can and must do better to make our communities safer for people of all ages to walk, whether to get to shops, schools or parks, for physical or mental health boosts, or just to enjoy some time and company out in our community. ~Kathryn Harrington, Metro Councilor

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Public awareness campaigns can be an effective way to engage the public, such as ODOT's Oregonian Crossing campaign, spreading the message that every intersection is a crosswalk
Photo: Metro

CHAPTER 1 INTRODUCTION

The Regional Transportation Safety Strategy ("Regional Safety Strategy") sets regional transportation safety policy for the Regional Transportation Plan and provides a framework for working towards zero traffic related deaths and severe injury crashes in the region by 2035.

The Regional Safety Strategy provides the transportation safety action plan for the greater Portland region, defined as the area within the Metropolitan Planning Area (MPA). The MPA is slightly larger than the region's Urban Growth Boundary. The Regional Safety Strategy is a topical plan of the Regional Transportation Plan.

This Introduction provides context for the Regional Safety Strategy, including the role of Metro in transportation safety planning for the region, the policy framework that was used to guide the development of the Regional Safety Strategy, relationship to other plans, the planning process and public engagement, and the organization of the document.

Transportation safety is protection from death or bodily injury from a motor-vehicle crash through design, regulation, management, technology and operation of the transportation system.

Personal and public security is protection from intentional criminal or antisocial acts while engaged in trip making through design, regulation, management, technology and operation of the transportation system.

1.1 Metro's role in transportation safety planning

As the region's metropolitan planning organization (MPO), Metro has a variety of roles and requirements in transportation safety planning.

1. Safety policy and planning.
    - Setting and reporting on federally required safety performance targets.
    - Developing the Regional Transportation Safety Strategy and the Regional Transportation Plan (RTP), including safety goals, objectives, targets and performance measures, policies, strategies and actions, and investment strategies.
    - Reporting on performance outcomes measured against level of investment.
    - Allocating federal transportation funding through a project selection process informed by regional safety policies.

- Developing and reporting on the Metropolitan Transportation Improvement Plan (MTIP), including project consistency with regional plans and policies.
- Reviewing local comprehensive and transportation plans for consistency with the Regional Transportation Plan.
- Supporting and introducing safety legislation.
- Convening jurisdictions and agencies to achieve better coordination.

2. Data collection, maintenance, analysis and interpretation.
    - Gathering and maintaining data such as roadway network, traffic volumes, and vehicle miles traveled.
    - Improving crash and risk data and analysis tools.
    - Coordinating with the Oregon Department of Transportation and other partners on crash data.
    - Analyzing, interpreting and sharing regional data.
3. Encouraging best practices in transportation safety and roadway design with funding and programmatic support.
    - Developing regional street design guidelines.
    - Developing criteria for regional funding sources.
    - Supporting use of tools such as the Highway Safety Manual.
4. Collaborating on efforts to highlight safety in materials, messaging and campaigns.

1.2 Policy framework for the Regional Safety Strategy

This section describes the policy framework that guided the development of the Regional Safety Strategy. A review of current federal, state, regional and local policies related to transportation safety reveal a continuing and growing emphasis on transportation safety for all modes.[10] Five themes emerged from the policy review. The policy framework coupled with analysis of regional crash data guide the policies, strategies and actions in the Regional Safety Strategy.

1. Setting ambitious transportation safety goals for zero deaths and serious injuries.
2. Growing use of the Safe System approach, evident is policies such as Vision Zero, Towards Zero Deaths and Drive to Zero, to achieve better safety results.
3. Using data driven decision making, using data, performance measurement, and evaluation to develop data driven safety plans, strategies and actions and monitor progress towards goals.
4. Applying social equity (especially for race and income) and public health perspectives into safety plans and policy.

[10] Metro Transportation Safety Policy Framework Report, July 2016

5. Recognition of vulnerable users and the need to take additional actions to protect them.

Each of the five policy themes is explained in more detail below.

❶Setting ambitious goals

Setting a goal of zero or near zero deaths and severe injuries, with interim targets for reaching the goal, reflects the perspective that these deaths are not accepted as unpreventable deaths.[11] Setting ambitious transportation safety goals is increasingly used as a policy tool because ambitious goals are resulting in better outcomes, when those ambitious targets are supported by rigorous interventions and prioritization.[12] A recent report by the World Resources Institute found that many countries, states and cities that have adopted a Safe System approach have reduced road fatalities at a faster rate than others that followed a more traditional approach.[13] These places have also set ambitious targets, but the key is that they are supported by specified interventions and a coordinated leadership implementing the actions. In the U.S. from the federal level down, setting ambitious goals is redefining how safety is addressed:

- In October 2016, the U.S. Department of Transportation and the National Safety Council launched the 'Road to Zero' Coalition to end roadway fatalities in the next thirty years. The Secretary of Transportation noted that "setting the bar for safety to the highest possible standard requires commitment from everyone to think differently about safety – from drivers to industry, safety organizations and government at all levels."[14]
- In 2016, Oregon adopted its Transportation Safety Action Plan with a target of zero serious crashes by 2035.
- In the early 2000s, Washington and Minnesota were the first states to adopt the Toward Zero Deaths goal into their safety plans. Both states have had fewer fatalities and severe injury crashes, than did non-Toward Zero Deaths states and the rate of decline was faster.[15]
- Clackamas County has been a leader in setting aggressive safety targets. The county was the first local government in the state to develop a safety action plan. It uses the Toward Zero Deaths framework.

[11] Sustainable and Safe: A Vision and Guidance for Zero Road Deaths (2017) World Resources Institute and Global Road Safety Facility
[12] Towards Zero: Ambitious Road Safety Targets and Safe Systems Approach (2008) Transport Research Centre
[13] Sustainable and Safe: A Vision and Guidance for Zero Road Deaths (2017) World Resources Institute and Global Road Safety Facility
[14] Road to Zero Coalition, National Safety Council http://www.nsc.org/learn/NSC-Initiatives/Pages/The-Road-to-Zero.aspx and https://www.nhtsa.gov/press-releases/us-dot-national-safety-council-launch-road-zero-coalition-end-roadway-fatalities
[15] Munnich, Lee W., Jr., F. Douma, X. Qin, J.D. Thorpe, and K. Wang. 2012. Evaluating the Effectiveness of State Toward Zero Deaths Programs. Technical Report. Minneapolis: Center for Excellence in Rural Safety, University of Minnesota.

- Over 40 cities in the U.S. have adopted Vision Zero plans and have identified themselves as Vision Zero cities, including the City of Portland. The City of Portland has adopted a Vision Zero target for 2025 and developed an ambitious Vision Zero Plan with an equity lens. In 2016, the City of Hillsboro adopted a safety action plan with a target of zero by 2035. Beaverton completed a Transportation Safety Action Plan in 2017 with a goal of zero fatalities and severe injuries by 2035. Washington County has completed a plan with a vision of moving towards zero deaths.

❷ Use a Safe System approach

The Safe System approach has been developed and refined over many decades of application. Since it was first introduced, in Europe, it has been taken up at the country, state, and city levels around the world. The U.S. Department of Transportation is taking initial steps towards applying the Safe System approach at the national level.[16]

The system is often branded under a public policy identity, such as Vision Zero or Toward Zero Deaths, which aims to connect with the public and establish a direct link to the desired outcome. The best-known brand may be Sweden's Vision Zero. The name of this policy refers to the foundational principle that no loss of life should be acceptable on the roads. It also establishes an ambitious target to reach zero traffic fatalities. [17]

The Safe System approach involves a holistic view of the transportation system and the interactions among travel speeds, vehicles and road users. It is an inclusive approach that prioritizes safety for all user groups of the transportation system - drivers, motorcyclists, passengers, pedestrians, bicyclists, and commercial and heavy vehicle drivers. Consistent with the region's long-term safety vision, it recognizes that people will always make mistakes and may have road crashes—but the system should be forgiving and those crashes should not result in death or serious injury.

Whether the approach is called Vision Zero, Toward Zero Deaths, or Road to Zero, the Safe System approach focuses on **key guiding principles** that shape how transportation safety is addressed.

1. **No death or serious injury is acceptable** – lack of safety should not be a trade-off for faster mobility. Rather, the transportation system should be both safe and efficient.

[16] *New Safety UTC Envisions Safe Systems Approach for U.S. Roadways.* (October 2017) University Transportation Centers Program and U.S. DOT Office of the Assistant Secretary for Research and Technology.
https://www.transportation.gov/sites/dot.gov/files/docs/utc/286546/utcnewsletter115october.pdf
This national safety UTC is focused on implementing a collaborative, multidisciplinary, safe systems approach to reducing transportation-related injuries and fatalities, and to helping traffic safety become recognized as a public health priority in the United States.
[17] Sustainable and Safe: A Vision and Guidance for Zero Road Deaths (2017) World Resources Institute and Global Road Safety Facility

2. **Traffic deaths and severe injuries are preventable** - the focus is on fatal and severe injury crashes, not all crashes. This is one of the most important shifts in how traffic safety is perceived and addressed, shifting the focus to how and where people are dying. It helps prioritize and focus efforts to lead to more immediate outcomes.

3. **People make mistakes that can lead to road crashes** – design roadways so that crashes do not result in a serious injury. Safety should focus on systems-level changes above influencing individual behavior.

4. **Humans are vulnerable to injury** – especially people walking, bicycling, riding motorcycles and working in the right-of- way, and we must operate our transportation system to avoid serious injury.

5. **Responsibility is shared** – the people that design, build, manage, and use roadways and vehicles and provide post-crash care have a shared responsibility to prevent severe injuries and deaths.

6. **Proactive versus reactive actions** – rather than waiting for events to occur and reacting, a proactive approach should be taken to make the transportation system safe, systemically addressing risk. All parts of the system must be strengthened so that if one part fails road users are still protected.

7. **Data driven decision making**- use data, research and evaluation to understand crashes and risks and to guide decision making.

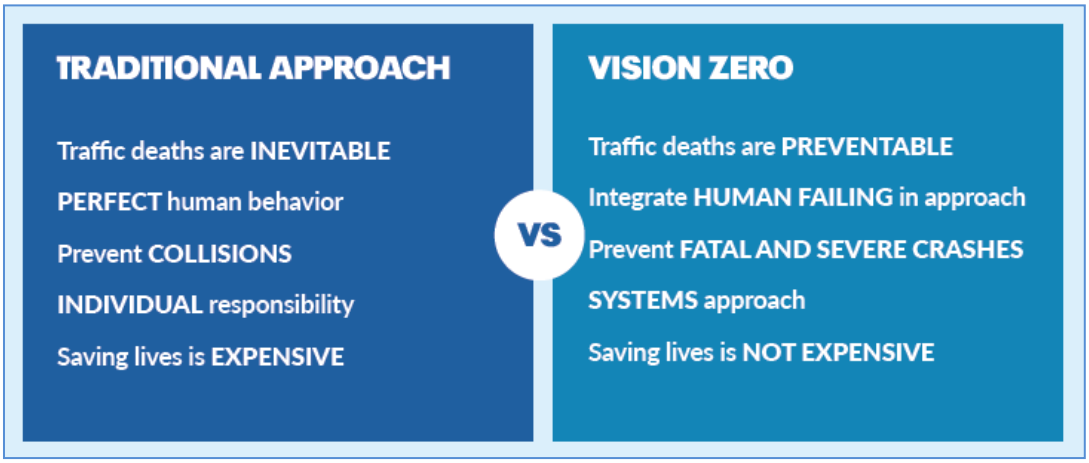


Figure 1: Vision Zero is a Safe System approach
Source: Vision Zero Network

The Safe System approach provides a framework for strategies and actions that starts with safe travel for all, including reducing disparities for people of color and people with low

incomes and for people walking and bicycling. Figure X illustrates the Safe System approach framework.[18]

Safe travel for all embraces the guiding principle that serious traffic crashes are preventable and that no death or severe injury is acceptable.

Safe streets encompasses roadway design that reduces the severity of crashes, education on how to navigate new roadway designs, information such as signage, and technology such as automated speed enforcement. Safety features are integrated into the road design from the outset, including segregating road users, segregating motor-vehicle traffic with medians and barriers, setting appropriate speeds to slow traffic, and designing roads that are "self-explaining" that is, they are designed so that the road user is aware of what is expected of them and behaves appropriately. There is also an emphasis on a proactive approach to road safety, with improvements made to improve both the actual and perceived risks of road safety.

Safe speeds encompasses reducing speeding, evaluating how posted speeds are set and establishing appropriate speed limits, enforcing existing speed limits, especially with automated speed enforcement, and educating road users. Speed is a primary factor in the severity of many crashes and reducing speeding and speeds is seen as a critical way to prevent serious crashes. [19] Speed limits in safe systems are based on aiding crash avoidance and a human body's limit for physical trauma.

Safe vehicles encompasses vehicle technology and licensing and registration, including increasing the frequency of license testing. Vehicles are designed, built and regulated to minimize the occurrence and consequences of crashes, with the emphasis on collision survivability. There are two main strands to safer vehicles – technology and road-worthiness. Vehicle technology, such as autonomous vehicles, holds great promise for improving safety, but policies and regulations will be needed to ensure that all road users benefit equally.

Safe people encompasses education and coordination focused on reducing traffic and road rule compliance. Programs such as Safe Routes to School provide foundational transportation behavior training. Campaigns, messaging, media and public perception all inform how people operate and travel within the public right-of-way.

[18] The safe systems approach to road safety, Brake the road safety charity, UK (September 2015) http://www.brake.org.uk/facts-resources/15-facts/1484-safe-systems-facts-page

[19] Safety Study: Reducing Speeding-Related Crashes Involving Passenger Vehicles, National Transportation Safety Board (2017)

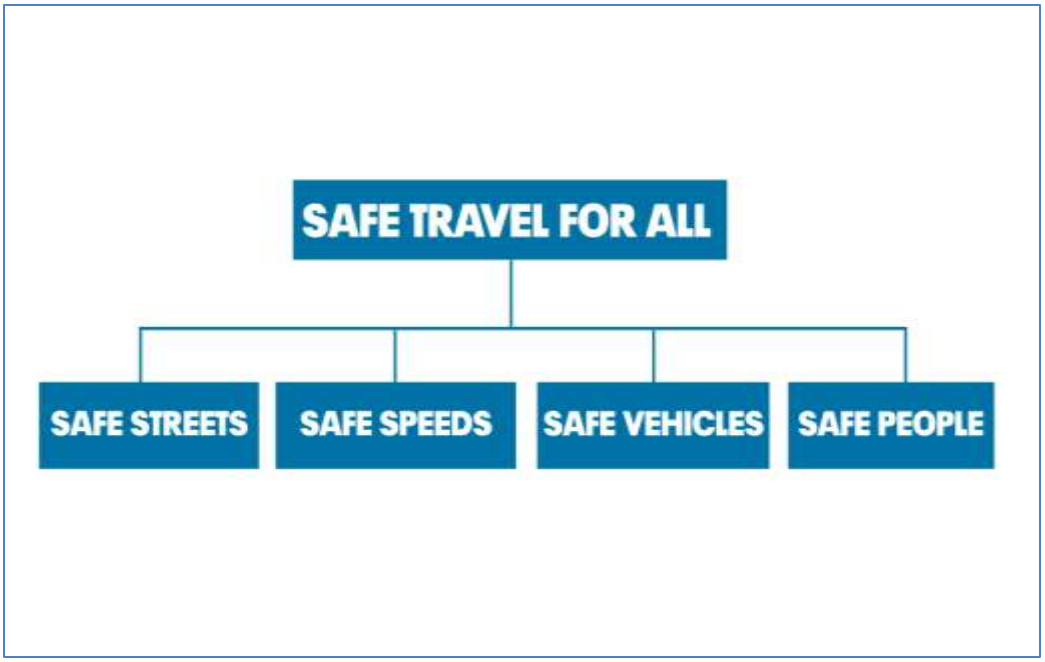


Figure 2: Vision Zero Safe System Approach
Source: Vision Zero Network

Governments are increasingly using the Safe System approach because it is proving to be effective in the countries where it has been in place for decades. Many countries, states, and cities that have adopted a Safe System approach have reduced road fatalities at a faster rate than others that followed the traditional approach.[20]

❸ Data driven decision making

A data driven approach to safety uses crash data, risk factors, and other supported methods to identify the best possible locations to achieve the greatest benefits. Within the Safe System approach the focus is on fatal and severe injury crashes, not all crashes, and systemic approaches to prevent serious crashes from occurring.

Policies at all levels of government emphasize collecting and tracking data on fatal and severe injury crashes, crash risks, contributing factors and countermeasures to crashes to inform plans and investments. Understanding why fatal and severe injury crashes occur and who is most vulnerable is used to direct limited investments and to develop policies and actions to reduce fatal and severe crashes.

Strategies to improve data collection and availability (timelines, accuracy, etc), types of data available (post-hospital data, demographics, etc) must be pursued to support data driven plans and policies. Also needing greater attention is how crash risk is defined and addressed. Crash risk must be carefully defined based on data.

[20] Sustainable and Safe: A Vision and Guidance for Zero Road Deaths (2017) World Resources Institute and Global Road Safety Facility

Figure 3: Data driven safety analysis
Source: Federal Highway Administration

The Federal **Highway Safety Improvement Program** (HSIP) requires a data driven, strategic approach to improving highway safety that focuses on performance. Beginning in 2016, the HSIP National Summary Report includes an evaluation of how states are using data-driven safety decision making to support their safety action plans.[21]

The Oregon Department of Transportation's **All Roads Transportation Safety** program (ARTS) uses federal funds from the Highway Safety Improvement Program, and uses a data driven approach that addresses safety for all public roads in the state of Oregon.[22]

The **2018 Metro State of Safety Report** documents roadway crash data and patterns in the region. The Oregon Department of Transportation has assembled and distributed statewide crash data since 2007. The data includes numerous information fields for each geocoded crash and is complemented by Metro datasets of transportation infrastructure, transportation operations, and spatial data. The combination of these provides the opportunity of detailed analyses of the safety of the region's transportation system and land use patterns.

❹ Applying a racial equity and public health lens

A review of current policies shows that there is a growing need to more explicitly link equity and public health with transportation safety planning.

- Recognizing that transportation related injuries and fatalities are a public health priority and applying public health principles to solve a population health issue is one way that a public health lens is being applied to transportation safety.

- Recognizing the disproportionate impact of serious traffic crashes on people of color, people with low incomes and older adults and taking equity driven actions to reduce the disproportionate impact on these populations is one way that an equity lens is being applied to transportation safety.

[21] U.S. Department of Transportation, Federal Highway Administration, Highway Safety Improvement Program (HSIP) https://safety.fhwa.dot.gov/hsip/ (April, 2017)
[22]Oregon Department of Transportation, All Roads Transportation Safety, http://www.oregon.gov/ODOT/Engineering/Pages/ARTS.aspx

The Regional Safety Strategy applies a public health and race and income equity lens to the policies, strategies and actions. Additionally, it looks at the safety issues for other vulnerable groups such as children, older adults, and people walking, bicycling or riding motorcycles.

Equity

Numerous reports and studies, mostly at the national level, are providing data showing that your risk of dying in a motor-vehicle involved crash is higher if you are a person of color, are over 65 or have a lower income.[23] These disparities in public health and safety outcomes demonstrate the need and necessity to apply an equity and public health lens.

Title VI of the Civil Rights Act of 1964 prohibits discrimination of any person based on race, color, and national origin in programs and activities receiving federal financial assistance, including transportation. This important legislation is a cornerstone to providing an equitable transportation system, however it does not address the systemic effects of racism which continue to create inequitable outcomes for communities of color, including in transportation safety. Applying a racial equity lens in analysis and in the development of policies, strategies and actions begins to identify ways to address the systemic effects of racism.

In 2016, Metro adopted the Strategic Plan to Advance Racial Equity, Diversity and Inclusion.[24] The Racial Equity Strategy, as it is known, lays the foundation for the region's policy approach to reducing disparities and eliminating barriers for people of color. The Metro Council provided policy direction that the Regional Transportation Plan and its topical and modal plans to use a racial and income equity lens when developing policies, strategies and actions.

Racial equity, as defined in the Regional Transportation Plan, is when race can no longer be used to predict life outcomes and outcomes for all groups are improved.

[23] *Motor Vehicle Traffic-Related Pedestrian Deaths — United States, 2001–2010*, Centers for Disease Control and Prevention (2013); *Dangerous by Design*, National Complete Streets Coalition (2016); *Income Disparities in Street features that Encourage Walking*, Bridging the Gap (2012); *Pedestrians Dying at Disproportionate Rates in America's Poorer Neighborhoods*, Governing, August 2014; *America's Poorer Neighborhoods Plagued by Pedestrian Deaths*, Governing Research Report (August 2014)

[24] Racial Equity Strategy, Metro, June 2016 https://www.oregonmetro.gov/strategic-plan-advance-racial-equity-diversity-and-inclusion

Figure 4: Metro's Racial Equity Strategy

Public health

Public health and transportation have long been linked, and more recently traffic deaths and serious injuries are being seen as a public health crisis. As part of the built environment, where you live and travel (and your zip code) is one of the social determinants of health.

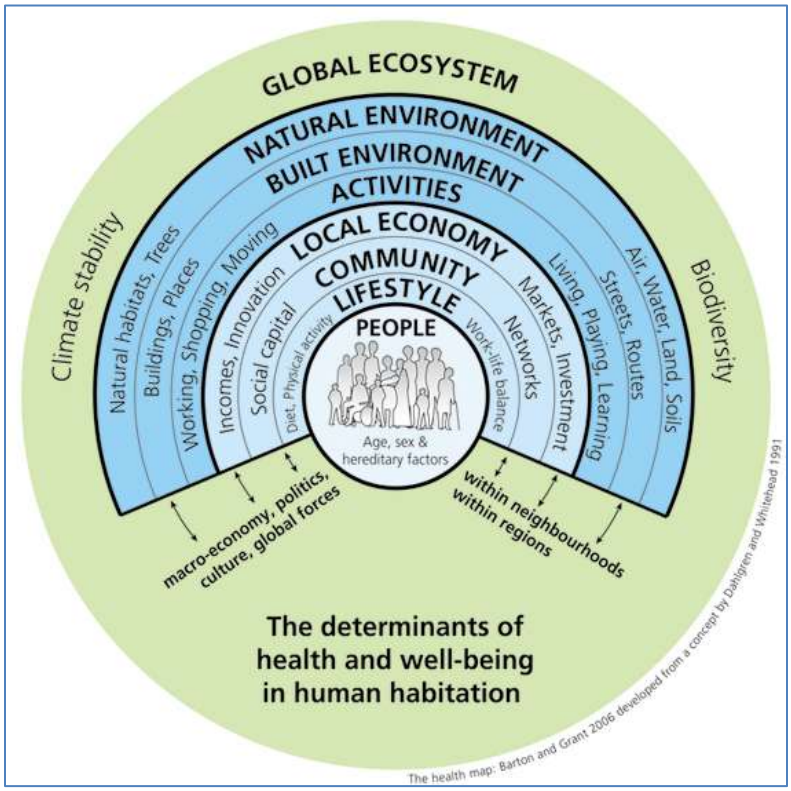


Figure 5: Health map showing streets and transportation routes are one of the determinants of health
Source: Barton and Grant, 2006

The Safe System approach to transportation safety recommends that all areas of government, including public health and transportation, must work together and coordinate to achieve zero serious crashes.

The Centers for Disease Control has identified reducing serious crashes as a "winnable battle" because of the large-scale impact to public health, because evidence-based interventions exist and can be broadly implemented and intensive focus and efforts could have a significant impact in a relatively short period of time.[25]

Applying public health principles to transportation safety requires looking at safety from a different perspective. For example, public health principles focus on upstream interventions that have increasing population impact and decreased individual effort. Interventions that require high amounts of individual effort have a relatively small population impact, while interventions that require low individual effort have a high population impact.[26]

The health of Oregonians is also directly connected to transportation safety.

-Oregon Transportation Options Plan, 2015

❺ Prioritize vulnerable users

Vulnerable users are people that are more vulnerable to being killed or seriously injured in crashes. Vulnerable users are pedestrians, bicyclists, motorcycle operators, children, older adults, road construction workers, people with disabilities, people of color and people with low income.

Emphasizing this policy theme in the Regional Safety Strategy helps identify strategies and actions to reduce disparities for these populations and provide safe travel for all.

The most recent Dangerous by Design report identifies people of color, people with low incomes and older adults as the populations most vulnerable to traffic deaths. The report states that between 2005 and 2014, Americans were 7.2 times more likely to die as a pedestrian than from a natural disaster.[27]

The U.S. Department of Transportation launched the **Safer People, Safer Streets Initiative** in early 2015, recognizing that bicyclist and pedestrian injuries and fatalities have steadily

[25] CDC Winnable Battles Final Report
Winnable battles are high burden, high priority public health work focused n aligning and accelerating intra- and inter-agency work and encouragement programs to think more broadly about partnerships beyond traditional public health partners.
[26] Health Impact Pyramid. Thomas Friedman.
[27] Dangerous by Design 2016 (January 2017) Smart Growth America, National Complete Streets Coalition

increased since 2009 while motor vehicle crash fatalities have declined.[28] The goal of the Initiative is to increase safety for people walking and bicycling, and states that supporting walking and bicycling "supports national goals."

In order to reduce the risk of increased exposure to traffic injury and air pollution for all road users, PHD recommends that Metro prioritize the design and maintenance of non-automobile facilities by:

- ***Including safety features for pedestrians and bicyclists such as separation from motorized traffic when possible. Prioritize non-automobile users in design and maintenance of streets.***
- ***Providing a parallel bicycle route one block removed from high-volume roads when feasible to reduce exposure to localized pollution while still maintaining access to community destinations.***

- Oregon Health Authority, Community Climate Choices Health Impact Assessment

1.3 Relationship to other plans

Transportation safety is an element of all state, regional and local land use and transportation plans and is achieved through the implementation and update of these plans. This section describes plans that relate to the Regional Safety Strategy.

A safer transportation system is sustainable and can help meet broader environmental, social and health goals identified in our land use and comprehensive plans. Increasing and promoting public transportation, walking and bicycling can help mitigate climate change and improve air quality by reducing carbon dioxide emissions from motor vehicles. Increasing the safety and security of public transportation, walking and bicycling also increases people's physical activity and enhances their quality of life and ability to access jobs and education. A transportation system that offers a variety of safe transportation options can better address the needs of a variety of demographic groups, including people of color, women, people with low incomes, people with limited mobility, youth and older adults.

[28] Safer People, Safer Streets: Summary of the U.S. Department of Transportation Action Plan to Increase Walking and Biking and Reduce Pedestrian and Bicyclist Fatalities (September 2014)

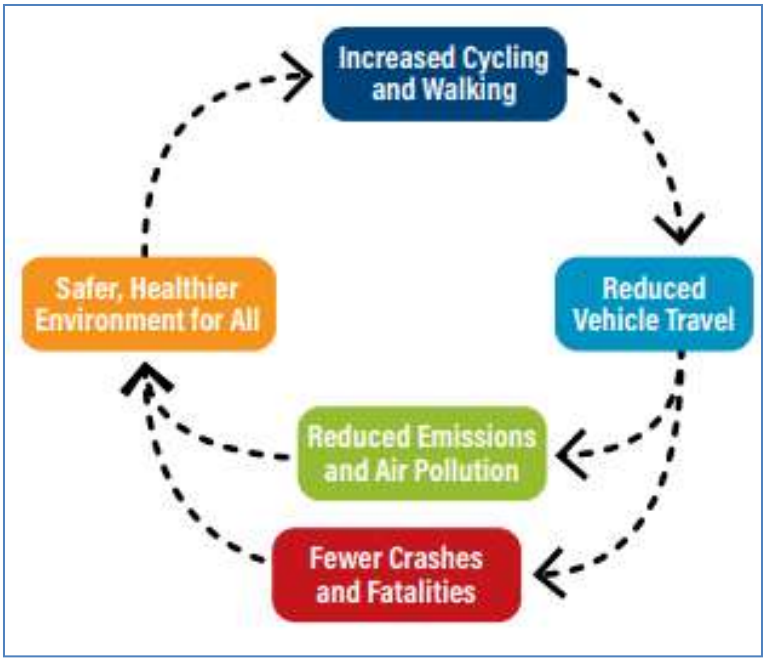


Figure 6: Environmental and Health Benefits of a Safe Transportation System
Source: Sustainable and Safe: A Vision and Guidance for Zero road Deaths (2017)

Transportation Planning Rule (TPR)

The Oregon Transportation Planning Rule (TPR) is located in Division 12, Chapter 660 of the Oregon Administrative Rules and implements Statewide Planning Goal 12 (Transportation) which "promotes the development of safe, convenient and economic transportation systems." The rule emphasizes a reduction in vehicle miles traveled specifies what local governments and state agencies are responsible for with transportation planning to meet the broad objectives of Goal 12.

Specifically, the Transportation Planning Rule requires jurisdictions within a Metropolitan Planning Organization area to adopt a Transportation System Plan that contains specific elements including a public transportation plan, a bicycle and pedestrian plan, a parking plan and transportation financing program. While safety is a theme and element of the Transportation Planning Rule, there is currently no requirement that transportation safety plans be developed as part of the Transportation System Plan.

Action 6.14 of the Regional Safety Strategy recommends updating sections of OAR 660-012-0000 the Transportation Planning Rule to require Transportation System Plans to include a transportation safety plan and to identify safety as a need and to clarify that making a known safety problem worse constitutes a "significant effect."

Oregon Transportation Safety Action Plan (TSAP)

The Federal Highway Administration requires every state to have a Strategic Highway Safety Plan, a statewide coordinated safety plan providing a comprehensive framework for reducing fatalities and severe injuries. The Oregon Transportation Safety Action Plan serves as the Oregon Strategic Highway Safety Plan and must be updated every five years.

In 2016, the Oregon Transportation Commission adopted an updated Oregon Transportation Safety Action Plan with a target of zero traffic deaths and severe injuries by 2035. The plan identifies Emphasis Areas for near term focus, goals, policies and strategies. It addresses all modes on all public roads in Oregon.

The Oregon Transportation Safety Action Plan shapes regional and local safety plans, including the Regional Safety Strategy, and is in turn shaped by and responsive to the needs identified in local, county, regional and Tribal safety plans.

2040 Growth Concept
The 2040 Growth Concept is the greater Portland area's long-range growth management plan and provides a concept of land-use and transportation policies. Among other things, it emphasizes providing transportation choices and safe neighborhoods.

The Urban Growth Management Functional Plan provides tools to meet goals of the 2040 Growth Concept and the Regional Transportation Functional Plan (see below) implements the transportation elements of the 2040 Growth Concept.

Both the 2040 Growth Concept and the Urban Growth Management Functional Plan provide the land use context to which transportation decisions, including actions to reduce crashes and increase transportation safety, are guided by.

Regional Transportation Plan (RTP)
The Regional Transportation Plan is the transportation system plan for the greater Portland area and lays out the region's transportation concepts and policies to support a complete and interconnected transportation system that supports all modes of travel and implementation of the 2040 Growth Concept.

For the 2018 update, safety was identified as a key policy area. The Regional Safety Strategy is a topical plan of the 2018 Regional Transportation Plan and updates the transportation safety elements.

Regional Transportation Functional Plan (RTFP)
The Regional Transportation Functional Plan is the implementing plan of the Regional Transportation Plan and specifies what local Transportation System Plans are required to include. It serves as the primary transportation policy implementation of the 2040 Growth Concept.

For safety, the Regional Transportation Functional Plan specifies that:

- New street construction and re-construction must be designed to improve safety (3.08.110 A);
- Cities and counties must consider safety improvements (along with TSMO strategies and operational and access management improvements) before other strategies to meet transportation needs and performance targets and standards (3.08.220);

- Each city and county shall include performance measures for safety (3.08.230 D);

The Regional Safety Strategy includes Action 6.13 which recommends updating the Regional Transportation Functional Plan to require Transportation System Plans to include a transportation safety action plan, with data analysis that addresses all modes and is based on a safety inventory based on both an analysis of crash rates and an analysis of crash risks; to require that Transportation System Plans identify safety as a need; and to require that transportation projects do not make a known safety problem worse, and to be consistent with the Regional Safety Strategy.

Topical and modal plans of the Regional Transportation Plan

Transportation safety is a component of other regional topical and modal plans of the Regional Transportation Plan, including the Climate Smart Strategy, Regional Freight Plan, Regional Transit Plan, Regional Travel Options Plan, Transportation System Management and Options Plan, RTX the Emerging Technologies Strategy and the Regional Active Transportation Plan. Implementing these plans helps achieve Vision Zero. Additionally, Metro's regional street and trail design guidelines emphasize engineering and design treatments to achieve Vision Zero streets.

Local Comprehensive Plans

Oregon's statewide planning goals are achieved through local comprehensive plans. Comprehensive plans are long-range plans which include the goals and policies to help jurisdictions prepare for and manage expected population and economic growth.

Local Transportation System Plans and Transportation Safety Action Plans are parts of the overall Comprehensive Plan; local Transportation System Plans must "conform with local and regional comprehensive land use plans." This planning hierarchy reinforces the approach that transportation decisions, including how to address safety, should respond to the context of the surrounding land use.

Local Transportation System Plans (TSP)

Local transportation system plans, or TSPs, developed by cities and counties in the region must be consistent with the Regional Transportation Plan and are required by the Oregon Transportation Planning Rule. Transportation System Plans are long-range plans that guide transportation investments to achieve desired goals and outcomes. The plans include policies, plans for different transportation modes, and a finance plan.

Typically, safety is a theme and goal in Transportation System Plans but there is not a separate plan or section with specific safety strategies, actions or projects. As more jurisdictions in the greater Portland area are developing Transportation Safety Action Plans and benefitting from them, the need for specific safety plans as part of Transportation System Plans is being recognized.

The Regional Safety Strategy includes Actions 6.13 and 6.14 which recommends updating the Regional Transportation Functional Plan and the Transportation Planning Rule to require Transportation System Plans to include a Transportation Safety Action Plan,

including analysis of crash data to identify common crash types and contributing factors, identification of high risk and high injury locations, and recommended actions and projects.

Local Transportation Safety Action Plans (TSAP)
Several cities and counties in the region have adopted or are in the process of developing local transportation safety action plans. Clackamas County was the first county in the state to adopt a Transportation Safety Action Plan in 2012. Portland adopted the first Vision Zero Plan in the region, Hillsboro adopted a Transportation Safety Action Plan in 2017 with a Vision Zero target, and Washington County completed a Transportation Safety Action Plan in 2017. Coordinating implementation of these plans is an important element of achieving Vision Zero.

1.4 Planning process and public engagement

The Regional Transportation Safety Strategy was updated in coordination with and as part of the update of the Regional Transportation Plan between May 2016 and December 2018. Throughout the planning process, transportation safety was repeatedly identified as a major issue for the region. In Metro quick polls and public opinion surveys safety was identified as a top concern. Elected and community leaders highlighted safety as one of eight policy focus areas for the 2018 Regional Transportation Plan and indicated early support for adoption of a Vision Zero framework and target. A technical work group provided technical review and expertise as the Safety Strategy was developed.

Regional leadership

The Metro Council, the Joint Policy Advisory Committee on Transportation (JPACT), Metro Policy Advisory Committee (MPAC), and community and business leaders provided policy direction for the Regional Safety Strategy. Early on in the process regional leaders provided direction to use a Vision Zero goal and framework. They supported the development of Regional High Injury Corridors and Intersections to help guide investments and supported identifying specific projects in the Regional Transportation Plan as safety projects.

Regional leaders provided policy direction at four Regional Leadership Forums and safety was consistently one of the top policy issues. Additionally, the Metro Council committed to supporting a Regional Safety Strategy with a Vision Zero target and framework with a racial and income equity lens.

"What's your goal?" video

Metro interviewed people in the greater Portland area and asked them what the traffic fatality goal should be for their family – everyone said zero. They were all asked if that should be the goal for everyone – they all said yes.

Figure 7: What's your Goal? Video
Source: Metro, KidFestNW Portland Expo Center, February 18, 2017

Focus groups and stakeholder interviews

To develop the work plan for the update the Regional Transportation Plan, Metro conducted focus groups and stakeholder interviews. Input from these processes was used to shape the work program and policy focus areas for the update. Safety was confirmed as a priority focus area through the input.

In June 2015, Metro sought input from culturally-based and youth focus groups on questions related to equity, transportation, housing, parks and natural areas, and community engagement. Input related to safety included bicycle safety, personal safety on the MAX, and safety at bus shelters including lighting and presence of a shelter, lack of sidewalks and lack of safe routes to get to parks. [29]

Figure 8: Participants in the Metro Discussion Groups, June 2015

In October 2015, Metro conducted stakeholder interviews for the update of the Regional Transportation Plan. Interviewees included elected officials, businesses, and community organizations from across the greater Portland area. Input related to safety that emerged from the interviews were: making safety the highest priority, allowing for mode separation of modes, such as separated bicycle facilities, to improve traffic flow and safety, improving safety around schools, and lack of sidewalks.[30]

Online public comment opportunities

For the update of the Regional Transportation Plan Metro provided opportunities for the public to comment online about transportation priorities. Safety was consistently a top concern and need identified by the people that commented.

[29] Metro Discussion Groups (August 2015)
https://www.oregonmetro.gov/sites/default/files/2016/01/29/RTP-2018-DiscussionGroupReport-20150805.pdf
[30] 2018 RTP Update Stakeholder Interview Report (October 2015)
https://www.oregonmetro.gov/sites/default/files/2015/10/30/RTP-2018-StakeholderInterviews-20151027.pdf

Metro conducted an online quick poll in July and August 2015. After traffic, safety was identified as a top transportation issue, and it was identified as the top transportation issue in Multnomah County.[31]

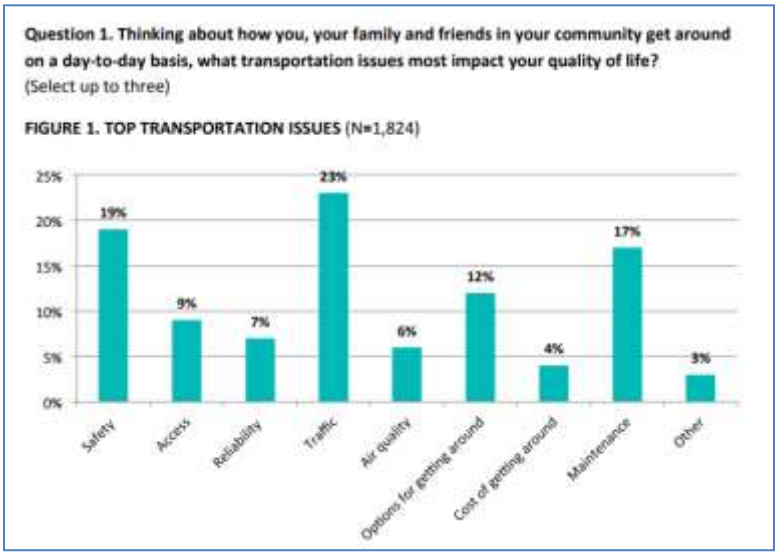


Figure 9: Metro Quick Poll, August 2015

In the online public comment period in March 2017, reducing fatal ad severe injury crashes for people walking, bicycling and driving was identified as the highest need after maintaining the transportation system.[32]

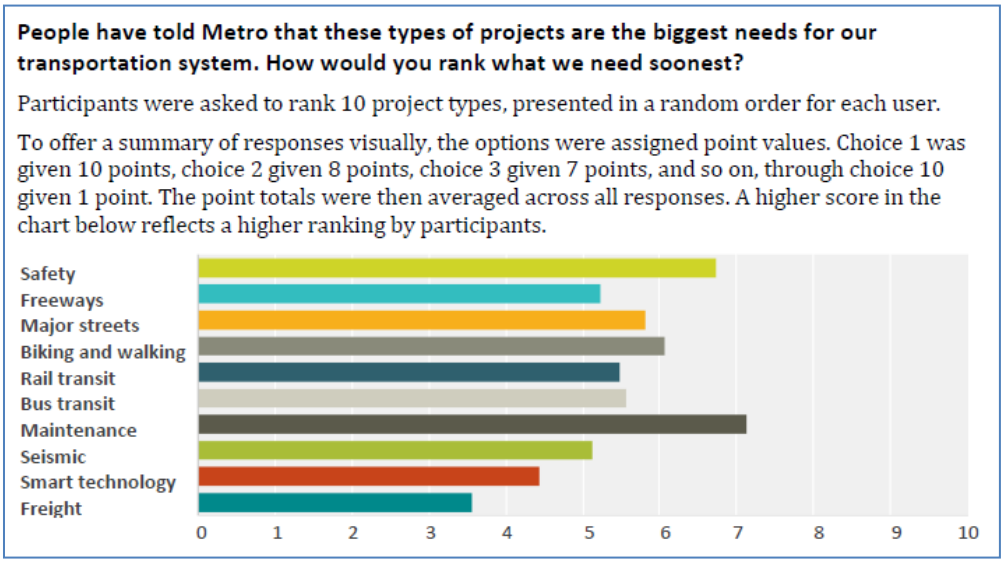


Figure 10: Metro On-line Survey, March 2017

[31] 2018 RTP Update Online Quick Poll 1 report (October 2015)
https://www.oregonmetro.gov/sites/default/files/2015/10/21/RTP-QuickPoll1-Results-20151021.pdf
[32] 2018 RTP Update Public Comment Report: Priorities for our transportation future (May 2017)
https://www.oregonmetro.gov/sites/default/files/2017/05/12/RTP-winter-comment-report-051217.pdf

Safety Technical Work Group

A Regional Transportation Safety Technical Work Group was formed in April 2016 and provided the primary technical work and guidance on the update of the Regional Safety Strategy. The work group developed the updated safety targets and support for the Vision Zero and Safe Systems framework.

The Regional Transportation Plan's Transportation Equity and Performance Measure Work Groups provided review and substantial input on the Safety Strategy throughout the process. The Transportation Equity Work Group supported adopting a Vision Zero target and proposed two safety system evaluation measures to better understand the impact of the 2018 Regional Transportation Plan investment strategies on areas with historically underserved communities. The Transportation Equity Work Group also recommended considering how racial equity and public health were impacted by the Safety Strategy.

The technical work group included representation from the following agencies and organizations. Families for Safe Streets, police and fire were not represented on the work group. This gap in representation needs to be rectified in future regional safety work groups.

- Federal Highway Administration
- Oregon Department of Transportation, Region 1
- Clackamas County
- Multnomah County Public Health
- Washington County
- City of Beaverton
- City of Gresham
- City of Hillsboro
- City of Lake Oswego
- City of Portland
- City of Wilsonville
- TriMet
- National Safe Routes to School Partnership
- Oregon Walks
- The Street Trust

Figure 11: First meeting of the safety work group in May 2016

Metro technical advisory committees

In addition to the Regional Transportation Plan technical work groups, Metro's technical advisory committees, Transportation Policy Advisory Committee (TPAC) and Metro Technical Advisory Committee (MTAC), provided valuable review and input on the development of the Regional Safety Strategy.

1.5 Document organization

The Regional Safety Strategy is organized into six chapters, with a foreword, executive summary, and back matter such as a glossary and list of acronyms. Supporting documents are provided as stand-alone appendices. This section provides an overview of the different parts of the document.

[To be finalized when draft is finalized]

Foreword
Introduces the genesis, purpose, limitations, and scope of the plan.

Executive Summary
Provides a short summary and key elements of the plan.

We Remember
Describes why it is important to take serious action to end traffic violence through community stories.

Chapter 1: Introduction
Provides and introduction to and context for understanding the strategy.

Chapter 2: Regional Transportation Safety Policy
Describes regional safety goals, objectives, targets and policies, including reoginal high injury corridors and targets.

Chapter 3: Trends and Factors in Serious Crashes
Provides key findings from analysis of the crash data used to identify the strategies and actions. Identifies the top three findings.

Chapter 4: Strategies and Actions
Describes data-driven strategies and actions to help achieve Vision Zero.

Chapter 5: Implementation
Describes how the Regional Safety Strategy will be implemented in the next few years by Metro and partners.

Chapter 6: Measuring Progress
Describes performance measures to monitor progress towards achieving Vision Zero.

Acronyms
Defines acronyms used in the document.

List of Partners
Lists agencies, organizations, non-profits, private entities, industry and the public that could play a role in implementing the Regional Safety Strategy.

Resources
Provides a list of resources for further information.

Glossary
Defines terms used in the document.

Appendix
2018 Metro State of Safety Report
Describes the data used in the analysis, the attributes of the data, and any data limitations. Describes the process Metro used to analyze the data. The2018 Metro State of Safety Report presents the findings, identifying trends and relationships of serious crashes with environmental factors including roadway and land use characteristics and serves as the foundation for the Regional Safety Strategy.

CHAPTER 2 REGIONAL TRANSPORTATION SAFETY POLICY

This chapter describes adopted regional policies related to transportation safety, including vision, goals, objectives, targets and performance measures. Chapters 4 and 5 describe the strategies and actions to take to achieve regional goals and targets.

The information in this chapter is included in the policy chapter of the 2018 Regional Transportation Plan. To move from vision to action the Regional Safety Strategy uses a strategic plan framework where strategies and actions are informed by and build off of a strong policy foundation. The Regional Transportation Plan and each regional modal and topical plan starts with the regional transportation vision, identifies desired goals, measureable objectives for each goal, specific policies that describe what must be done to achieve desired outcomes, and then specific actions to implement policies. Each strategy is a series of actions. Targets and performance measures track progress (see Chapter 6).

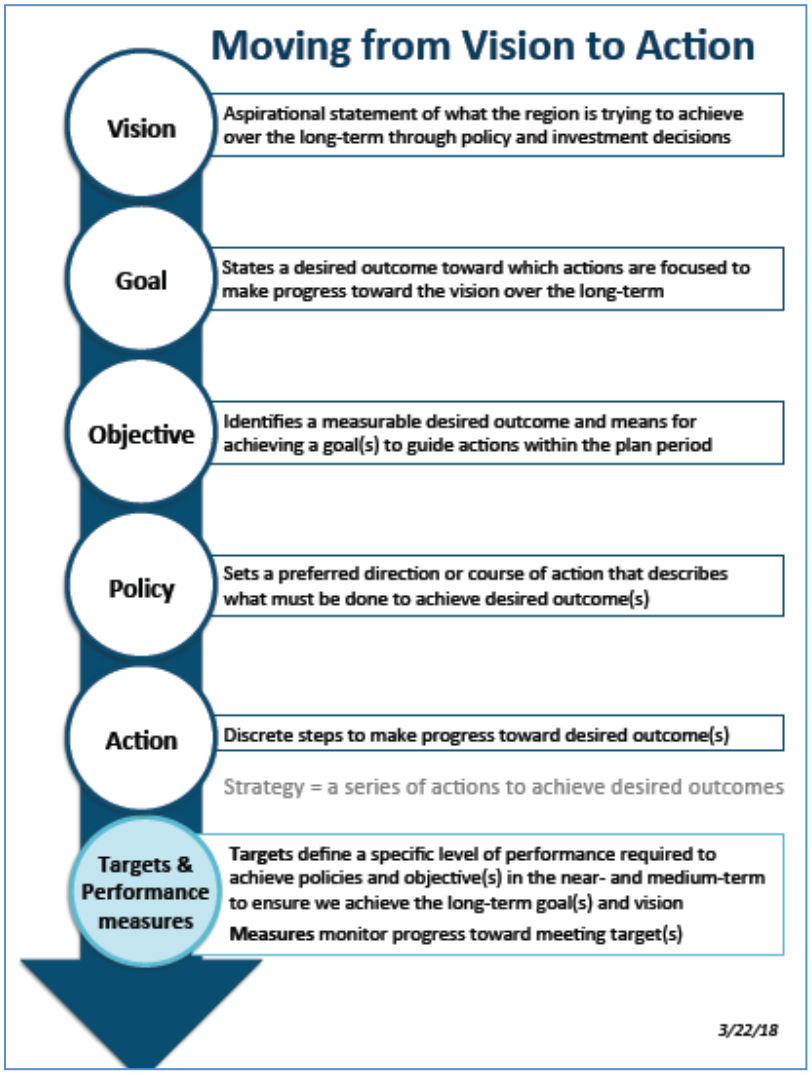


Figure 12: Components of the Regional Transportation Plan and topical and modal plans

2.1 Regional Transportation Plan vision

The 2018 Regional Transportation Plan provides a vision for the transportation system. Transportation safety is a crucial element of the vision.

> ***In 2040, everyone in the Portland metropolitan region will share in a prosperous, equitable economy and exceptional quality of life sustained by a safe, reliable, healthy, and affordable transportation system with travel options.***

2.2 Safety and security goal and objectives

The 2018 Regional Transportation Plan has ten goals for the regional transportation system. Goal 5 is the transportation safety and security goal.

Public and personal security has an important relationship to transportation safety, especially for people of color. Fear of harassment or being targeted can deter people of color from walking, bicycling or using transit.

Goal 5: Increase Safety and Security

People's lives are saved, crashes are avoided and people and goods are secure when traveling in the region.

Objective 5.1 Transportation Safety

Eliminate fatal and severe injury traffic crashes for all modes of travel.

Objective 5.2 Security

Reduce vulnerability of the public, goods movement and critical passenger and freight transportation infrastructure to crime and terrorism.

2.3 Vision Zero safety target

The Regional Safety Strategy updates the regional transportation safety target in the Regional Transportation Plan with a Vision Zero target.

By 2035 eliminate transportation related fatalities and serious injuries for all users of the region's transportation system, with a sixteen percent reduction by 2020 (as compared to the 2015 five year rolling average), and a fifty percent reduction by 2025.

The target year of 2035 will not change in subsequent Regional Transportation Plan updates and progress towards meeting the target will be monitored each year. Refer to Chapter 6 for a description of how progress towards meeting the 2035 target, and the 2020 and 2025 interim targets, will be tracked.

The Vision Zero target is consistent with 2016 Oregon Transportation Safety Action Plan target of "no deaths or life changing injuries on Oregon's transportation system by 2035."

2.4 Regional safety policies

Policies in the Regional Transportation Plan guide investments in the region in support of meeting the regional transportation vision and goals.

Each of the regional network concepts in the Regional Transportation Plan - for transit, freight, arterials and throughways, bicycle and pedestrian – identifies supporting policies to develop and implement the regional transportation system. Polices are also identified for Racial and Social Equity, Emerging Technologies, Transportation System Management and Operations and Safety.

Transportation safety is mentioned in many of the Regional Transportation Plan policies. The 2018 Regional Transportation Plan is the first plan to include separate section dedicated to safety and security policies. See Chapter in this document 4 for strategies and actions.

Policy 1 Focus safety efforts on eliminating traffic deaths and severe injury crashes

Policy 2 Prioritize safety investments on high injury and high risk corridors and intersections

Policy 3 Prioritize vulnerable users with higher risk of being involved in a serious crash, including people of color, people with low incomes, people with disabilities, people walking, bicycling, and using motorcycles, people working in the right-of-way, youth and older adults

Policy 4 Increase safety and security for all modes of travel and for all people through the planning, design, construction, operation and maintenance of the transportation system

Policy 5 Make safety a key consideration in all transportation projects, and avoid replicating a known safety problem with any project or program

Policy 6 Employ a Safe System approach and use data and analysis tools to support data-driven decision making

Policy 7 Utilize safety and engineering best practices to identify low-cost and effective treatments that can be implemented systematically in shorter timeframes than large capital projects

2.5 Regional High Injury Corridors and Intersections

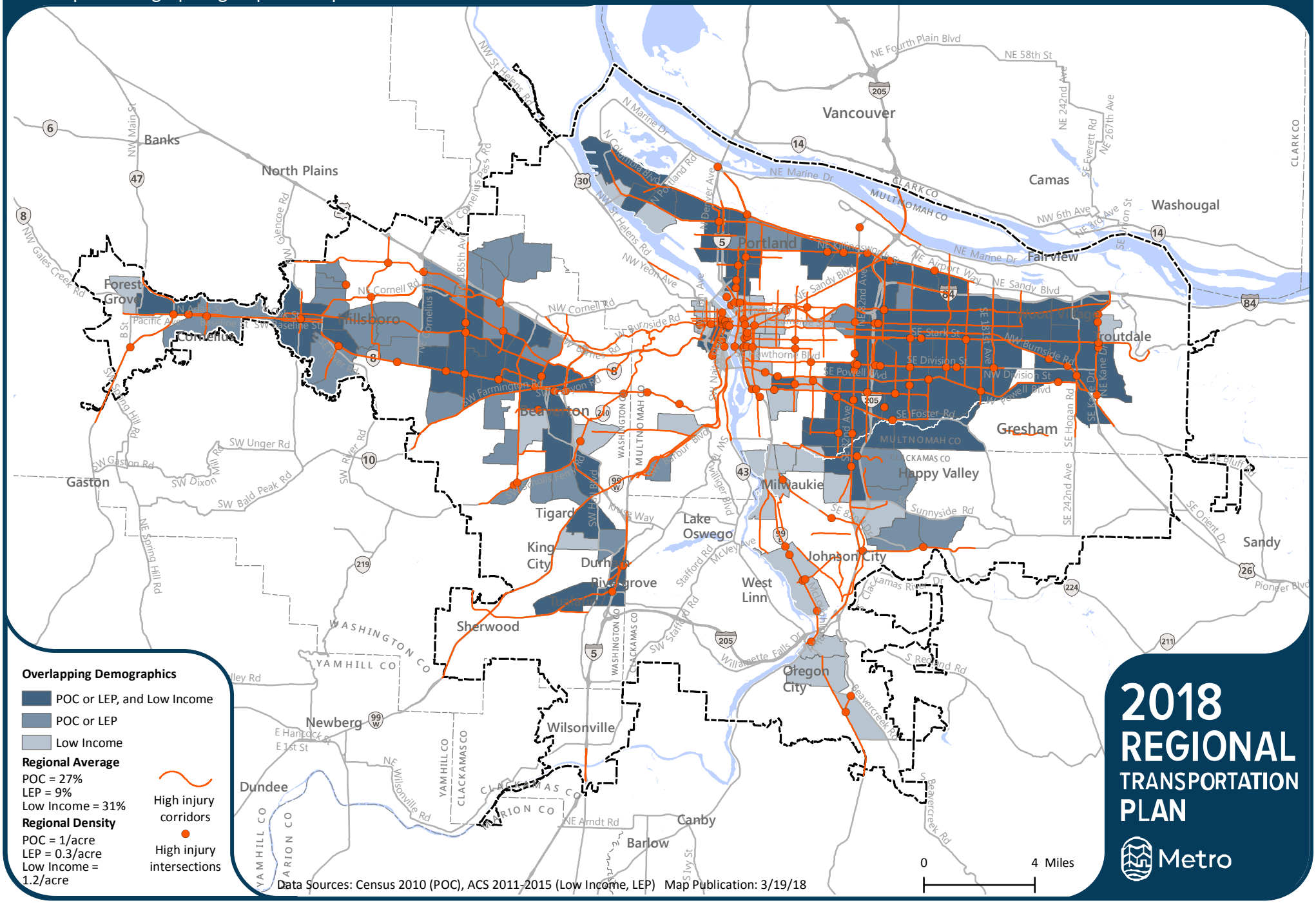
Using 2010-2014 crash data, Regional High Injury Corridors and Intersections identifies regional roadways and intersections where a majority of fatal and severe injury crashes for all modes are occurring. Sixty percent of fatal and severe injury crashes for motor-vehicle occupants, pedestrians and bicyclists occur on just six percent of the roadway miles in the region.[33]

The following map illustrates the High Injury Corridors and Intersections in the greater Portland region. A majority of high injury corridors are in communities with higher concentrations of people of color, people with low incomes and English language learners. The Regional High Injury Corridors and Intersections are identified to help prioritize safety investments.

[33] High injury corridors for serous crashes for all modes were identified, as were high injury corridors for auto only serious crashes, bicycle/auto only serious crashes, and pedestrian/auto only serious crashes. The map on the following page shows the combined corridors for all modes where 60 percent of all fatal and serious crashes occurred between 2010 and 2014, and were identified by using the following methodology: Fatal and Injury A (serious) crashes for all modes were assigned to the network; "Injury B", "Injury C", and "PDO (property damage only)" crashes involving bikes and pedestrians were also added to the network. Fatal and Injury A crashes are given a weight of 10; roadways are analyzed in mile segments; if a segment has only one Fatal or Injury A crash it must also have at least one B/C (minor injury) crash, for the same mode, to be included in the analysis. Roadway segments were then assigned an N-score (or "crash score") by calculating the weighted sum by mode and normalizing it by the roadway length. To reach 60 percent of Fatal and Severe Injury crashes, roadway segments had to have an N-score of 39 or higher; high injury Bicycle Corridors had to have an N-score of 6 or more, and high injury Pedestrian Corridors had to have an N-score of 15 or more. Intersections with the highest weighted crash scores were also identified; 5 percent of intersections had an N-score (or "crash score") higher than 80 and are also shown on the map, and 1 percent of intersections (the top 1%) had to have an N-score higher than 128.

High Injury Corridors Overlapping Communities of Color, English Language Learners, and Lower-Income Communities

This map shows the overlap of regional high injury corridors and road intersections with census tracts with higher than regional average concentrations and double the density of one or more of the following: people of color, people with low income, and English language learners. Census tracts where multiple demographic groups overlap are identified.



There can be multiple factors that contribute to a crash
Source: Metro

CHAPTER 3 TRENDS AND FACTORS IN SERIOUS CRASHES

This chapter **highlights key findings** from the analysis of five years of Oregon Department of Transportation crash data, 2011-2015, documented in the **2018 Metro State of Safety Report**. Data and findings from other national and state data sources and studies are also referenced.

"Serious crashes" are Fatal and Severe Injury (Injury A) crashes combined

Refer to the 2018 Metro State of Safety Report for the comprehensive data analysis for the greater Portland region.

Using data to identify trends and understand the underlying contributing factors in fatal and severe injury crashes is the first step in identifying the **data-driven strategies and actions** in the next chapter, and is an element of a Safe Systems approach to transportation safety.

3.1 Top three findings

Three top findings emerged from the analysis of serious crashes in the region and highlight a need for urgent action and focused strategic direction.

❶ Traffic deaths are increasing and are disproportionately impacting people of color, people with low incomes and people over age 65.

❷ Traffic deaths are disproportionately impacting people walking.

❸ A majority of traffic deaths are occurring on a subset of arterial roadways.

Making headway on these three findings is central to the region advancing Vision Zero, and will require focusing safety efforts on the most serious crashes, focusing investments in High Injury Corridors and low-income and communities of color and prioritizing pedestrian safety.

Each of the top three findings is described in more detail below. The remainder of the chapter identifies other key findings from the data, including findings on vulnerable users, roadway design, speed and speeding, alcohol and drugs, and aggressive and distracted driving.

Roadway improvements make it safer for this older adult to walk across SE Division Street in Portland
Source: Metro

❶ Traffic deaths are increasing and are disproportionately impacting people of color, people with low incomes and people over age 65.

- Serious crashes (fatal and severe injury crashes combined) have fluctuated since 2007, but have more recently been increasing. Initial data from 2016, 2017 and 2018 indicate that the trend is continuing. This is a trend that is also happening at the state and national levels.
- The regional annual fatality rate by population and vehicle miles traveled (for 2011-2015) has increased compared to the 2012 Metro State of Safety Report.[34]
- Your risk of dying in a motor-vehicle involved crash is higher if you are a person of color, are over 65 or have a lower income.[35]

[34] Fatality rates for traffic related crashes are the proportion of all crashes, person deaths or severe injuries for every 1 million people or every 100 million vehicle miles traveled.
[35] *Motor Vehicle Traffic-Related Pedestrian Deaths — United States, 2001–2010,* Centers for Disease Control and Prevention (2013); *Dangerous by Design*, National Complete Streets Coalition (2016); *Income Disparities in Street features that Encourage Walking,* Bridging the Gap (2012); *Pedestrians Dying at Disproportionate Rates in America's Poorer Neighborhoods,* Governing, August 2014; *America's Poorer Neighborhoods Plagued by Pedestrian Deaths*, Governing Research Report (August 2014)

- A majority of Regional High Injury Corridors are in communities with higher densities of people of color, people with low incomes and English language learners.
- A majority of pedestrian deaths are in are in communities with higher densities of people of color, people with low incomes and English language learners.
- Older drivers are twice as likely to die in a traffic crash. For male drivers age 70 to 79 and female drivers age 75 to 85 and older the share of serious crashes is double that of drivers in other age groups.
- In Oregon, American Indians/Alaska Natives have the highest average rate of vehicle related deaths (5.9 per 100,000) 1.8 times the rate among whites (3.3 per 100,000), and American Indians/Alaska Natives and Black or African American had the highest hospitalization rate -52.2 and 46.2 per 100,000, compared to 45.5 for whites and 20.8 Asian Pacific Islander for traffic related injuries.[36] This data is not currently available at the regional level.

❷ Traffic deaths are disproportionately impacting people walking.

- Auto-only crashes comprise ninety-one percent of all crashes, and thirty-eight percent of all fatal crashes. Pedestrian crashes make up two percent of all crashes, and thirty-six percent of all fatal crashes.
- Pedestrian traffic deaths are steadily increasing, are the most common type of fatal crash, and have the highest severity of any crash type.
- Pedestrian fatalities have steadily increased to 2015.
- A pedestrian crash is more than 26 times as likely to be fatal than a crash not involving a pedestrian, and more than 110 times as likely to be fatal as a rear end crash, the most common crash type.
- Roadway design is critical to pedestrian safety. Seventy-seven percent of serious pedestrian crashes occur on arterial roadways.

❸ A majority of traffic deaths are occurring on a subset of arterial roadways.

- Arterial roadways are the location of the majority of the serious crashes in the region. Sixty-six percent of all serious crashes occur on a roadway designated as an arterial.
- In the region, seventy-three percent of non-freeway serious crashes occur on a roadway designated as an arterial; seventy-seven percent of serious pedestrian crashes occur on a roadway designated as an arterial; sixty-five percent of serious bicycle crashes occur on a roadway designated as an arterial.
- Many of these arterial roadways are identified as Regional High Injury Corridors and Intersections.

[36] Oregon Public Health Authority, 2008-2014 crashes

3.2 All crashes

This section provides key findings for all crashes. Refer to the 2018 Metro State of Safety Report for additional information.

Serious crashes are increasing. Since 2007, the total reported crashes and all injury crashes have increased, region wide and in every city and county. Serious crashes (fatal and severe injury crashes combined) have fluctuated since 2007, but have more recently been increasing. Initial data from 2016, 2017 and 2018 indicate that the trend is continuing. This is a trend that is also happening at the state and national levels.

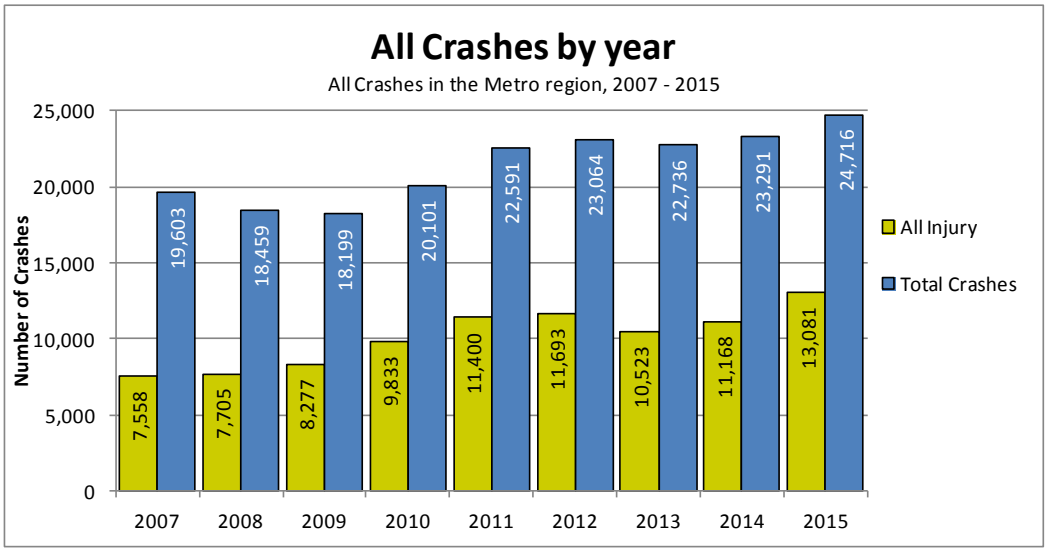


Figure 13: All crashes by year
Source: 2018 Metro State of Safety Report

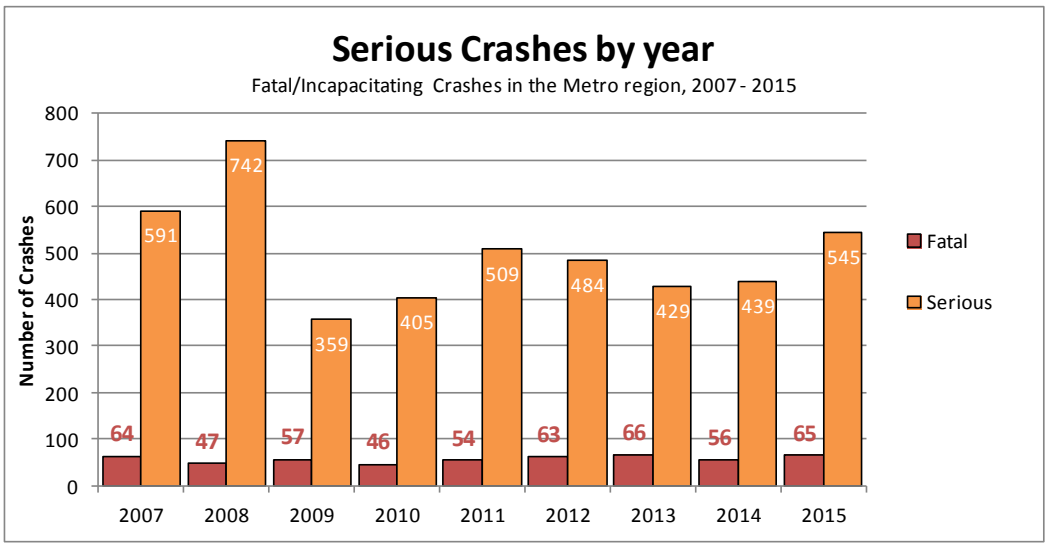


Figure 14: Fatal and Serious Crashes by year
Source: 2018 Metro State of Safety Report

Between 2011 and 2015, there were 304 fatal crashes killing 311 people, 2,102 crashes resulting in a life-changing injury, and 57,865 crashes resulting in some sort of injury.

On average, 62 people die each year on the region's roadways and 420 people experience a life changing injury. Nearly two people are either killed or severely injured every day in our region. Every 10 days a person riding a bike is killed or severely injured. Every 5 days a person walking is killed or severely injured.

Year	Total Crashes	Fatal Crashes (Fatalities)	Injury A Crashes	Injury B Crashes	Injury C Crashes	All Injury Crashes (Injuries)	Serious Crashes
2011	22,591	54 (54)	455	2,487	8,404	11,400	509
2012	23,064	63 (66)	421	2,654	8,555	11,693	484
2013	22,736	66 (68)	363	2,428	7,666	10,523	429
2014	23,291	56 (57)	383	2,512	8,217	11,168	439
2015	24,716	65 (66)	480	2,655	9,881	13,081	545
METRO	**116,398**	**304 (311)**	**2,102**	**12,736**	**42,723**	**57,865 (81,718)**	**2,406**

Figure 15: Crashes by year in the greater Portland area, 2011-2015
Source: Metro State of Safety Report, 2018

Traffic fatality rates are increasing. The regional annual fatality rate by population and vehicle miles traveled (for 2011-2015) has increased compared to the 2012 Metro State of Safety Report. The serious crash rate has decreased, and the all injury crash rate has increased.

2007-2009	Population (2010)	Annual VMT	All injury		Serious Crashes		Annual Fatal crashes	
			per 1M residents	per 100M VMT	per 1M residents	per 100M VMT	per 1M residents	per 100M VMT
Metro	1,481,118	9,308,676,259	5,106	81.2	359	5.7	36	0.59

2011-2015	Population (2015)	Annual VMT (2015)	Annual Injury crashes		Annual Serious crashes		Annual Fatal crashes	
			per 1M residents	per 100M VMT	per 1M residents	per 100M VMT	per 1M residents	per 100M VMT
Metro	1,603,229	10,437,000,000	7,219	111	300	4.6	39	0.60

Figure 16: Source 2012 and 2018 metro State of Safety Reports

Clackamas County has the lowest serious crash rate per population and vehicle miles traveled, compared to Portland, East Multnomah County, and Washington County. Clackamas County was the first local jurisdiction in Oregon to have an adopted safety plan. While annual fatality rates in the region have increased, annual serious crash rates by

population have slightly decreased in the region overall, Clackamas and Multnomah Counties and the City of Portland, and have increased in Washington County. Annual serious crash rates by vehicle miles decreased in the region as a whole, Clackamas, East Multnomah, and Washington Counties and increased in the City of Portland.

2007-2009 Annual Crashes						
			All injury		Serious Crashes (Fatal/Incapacitating)	
Sub-Region	Population	Annual VMT	per 1M residents	per 100M VMT	per 1M residents	per 100M VMT
Clackamas	256,986	1,615,525,690	4,210	67	593	9.4
Portland	583,627	4,376,272,685	6,500	87	388	5.2
East Multnomah	136,130	654,385,044	4,856	101	333	6.9
Washington	499,259	2,669,124,479	4,030	75	210	3.9
METRO	**1,481,118**	**9,308,676,259**	**5,106**	**81**	**359**	**5.7**

Figure 17: 2007-2009 annual crashes by population and VMT, 2012 Metro State of Safety Report

2011-2015 Annual Crashes						
			Annual Injury crashes		Annual Serious crashes	
Sub-Region	Population (2015)	Annual VMT (2015)	per 1M residents	per 100M VMT	per 1M residents	per 100M VMT
Clackamas	290,630	2,102,000,000	6,269	87	226	3.1
Portland	620,540	4,303,000,000	8,918	129	387	5.6
Multnomah (excl. Portland)	152,611	744,000,000	6,664	137	296	6.1
Washington	539,448	3,287,000,000	5,932	97	242	4.0
METRO	**1,603,229**	**10,437,000,000**	**7,219**	**111**	**300**	**4.6**

Figure 18: 2011-2015 annual crashes by population and VMT, 2018 Metro State of Safety Report

With the highest population and vehicle miles traveled, Portland has the largest share of the region's serious crashes.

	2011-2015 Annual Crashes						
Sub-Region	All	Fatal (Fatalities)	Injury A	Injury B	Injury C	All Injury	Serious
Clackamas	3,482	10.2 (10.4)	55	395	1,362	1,822	66
Portland	11,475	31.2 (31.8)	209	1,216	4,078	5,534	240
Multnomah (excl. Portland)	1,870	6.2 (6.2)	39	245	727	1,017	45
Washington	6,452	13.2 (13.6)	117	692	2,378	3,200	130
METRO	**23,280**	**60.8 (62.2)**	**420**	**2,547**	**8,545**	**11,573**	**481**

Figure 19: 2011-2015 annual crashes by sub-region, 2018 Metro State of Safety Report

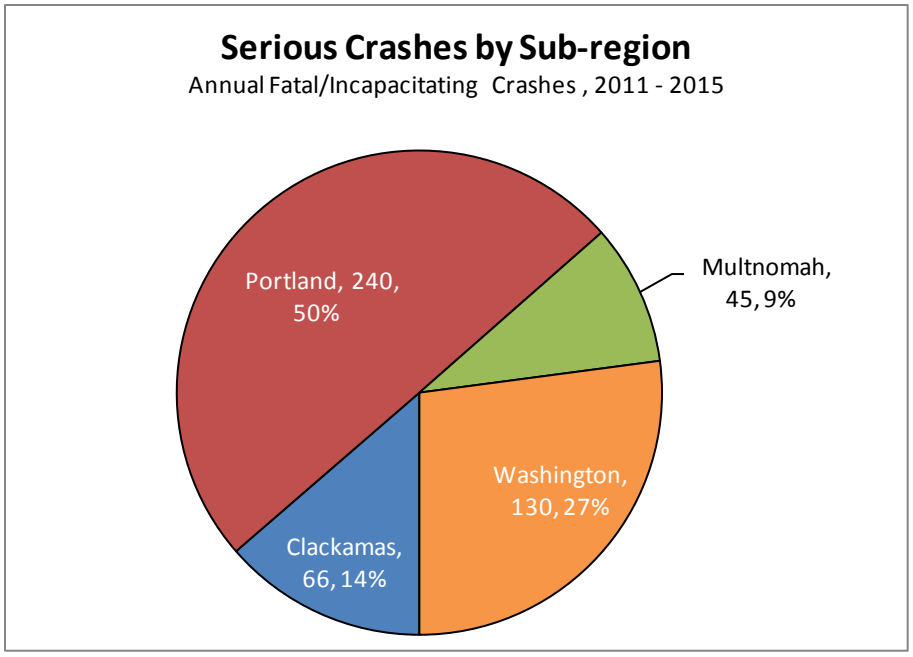


Figure 20: Serious crashes by sub-region, 2018 Metro State of Safety Report

Seatbelt use in the region exceeds ninety-nine percent. Serious crashes have a higher percentage of no seat belt use - nearly nine percent, compared to less than one percent for all crashes. Males were seventy-one percent more likely than females to be reported without a seat belt.

Seat Belt Use (All crashes, 2011-2015)					
Gender	**Seat Belt Use**	**No Seat Belt**	**Unknown**	**% Seat Belt Use**	**% No Seat Belt**
Males	81,267	769	47,229	99.1%	0.9%
Females	80,854	445	34,213	99.5%	0.5%
Unknown	245	2	6,261	99.2%	0.8%
METRO	**162,366**	**1,216**	**87,703**	**99.3%**	**0.7%**

Seat Belt Use (Serious crashes, 2011-2015)					
Gender	**Seat Belt Use**	**No Seat Belt**	**Unknown**	**% Seat Belt Use**	**% No Seat Belt**
Males	622	79	164	88.7%	11.3%
Females	768	51	100	93.8%	6.2%
Unknown	0	0	0	-	-
METRO	**1,390**	**130**	**264**	**91.4%**	**8.6%**

Figure 21: Seat belt use, 2011-2015
Source: 2018 Metro State of Safety Report

Not all communities have the same safety issues. Portland has the highest number of fatal and serious crashes, and Gladstone, Beaverton and Portland have the highest serious crash rate per captia. West Linn, Lake Oswego and Wilsonville have the lowest serious crash rate per capita.

City	2011-2015 Annual Crashes						
	All	Fatal	Injury A	Injury B	Injury C	All Injury	Serious
Beaverton	1,987	3.0	35	179	729	946	38
Cornelius	101	0.0	4	11	37	52	4
Durham	13	0.0	0	1	6	7	0
Fairview	88	0.2	1	13	35	49	1
Forest Grove	137	0.6	5	19	45	69	5
Gladstone	136	0.4	2	16	51	70	2
Gresham	1,356	3.4	27	170	546	747	30
Happy Valley	221	1.0	3	28	91	123	4
Hillsboro	1,413	3.6	26	177	545	751	29
Johnson City	0	0.0	0	0	0	0	0
King City	9	0.0	0	1	1	2	0
Lake Oswego	282	0.0	4	29	96	130	4
Maywood Park	27	0.0	1	2	12	15	1
Milwaukie	210	0.4	5	28	77	109	5
Oregon City	588	1.8	8	62	232	304	10
Portland	11,479	31.2	209	1,216	4,079	5,536	240
Rivergrove	1	0.0	0	0	0	0	0
Sherwood	160	0.2	2	18	58	79	3
Tigard	935	1.6	12	91	353	457	13
Troutdale	167	0.8	4	22	63	89	5
Tualatin	486	0.4	7	50	199	256	7
West Linn	213	0.6	2	23	78	104	3
Wilsonville	218	0.0	2	23	76	102	2
Wood Village	67	0.2	1	7	24	32	1
Unincorp Clack	1,651	6.0	30	187	670	893	36
Unincorp Mult	155	1.6	4	29	45	81	6
Unincorp Wash	1,180	3.8	26	144	397	571	30
METRO	**23,280**	**60.8**	**420**	**2,547**	**8,545**	**11,573**	**481**

Figure 22: 2011-2015 annual crashes, 2018 Metro State of Safety Report

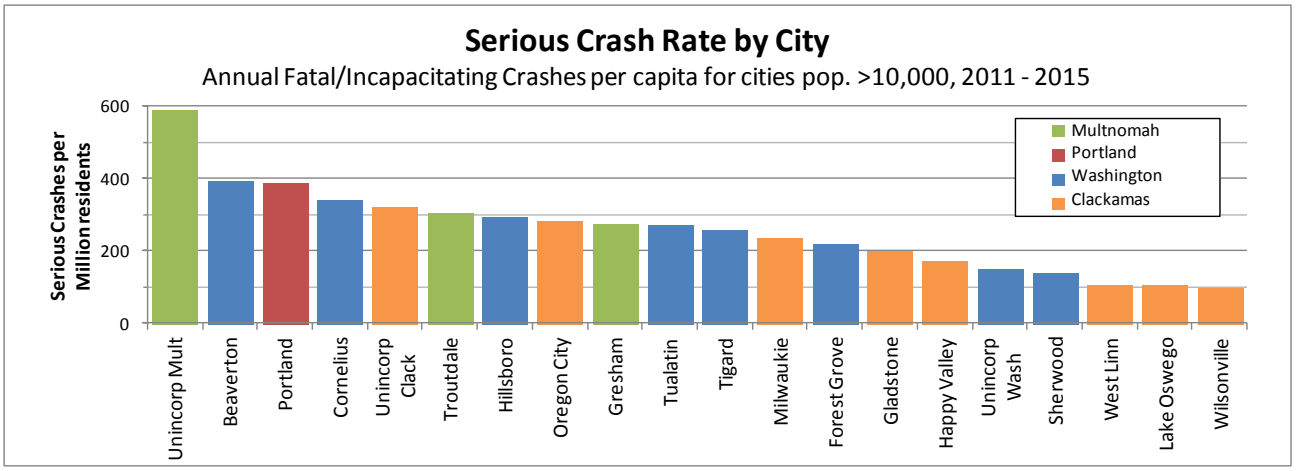


Figure 23: 2018 Metro State of Safety Report

The greater Portland region has one of the lowest roadway fatality rates of any urban metro area with a population greater than 1 million, most likely due to land use and transportation policies. The worst regions in the nation for overall fatality rates are concentrated in Florida and the Sun Belt, where driving is the completely dominant mode of travel. The safest regions in the nation for overall fatality rates are Boston, Minneapolis-St. Paul, Portland, New York, and Chicago. In general, the safest urban regions are those that exhibit dense urban environments and higher usage of non-auto travel modes. These findings indicate that regional and local land use and transportation plans, policies and investments are increasing transportation safety.

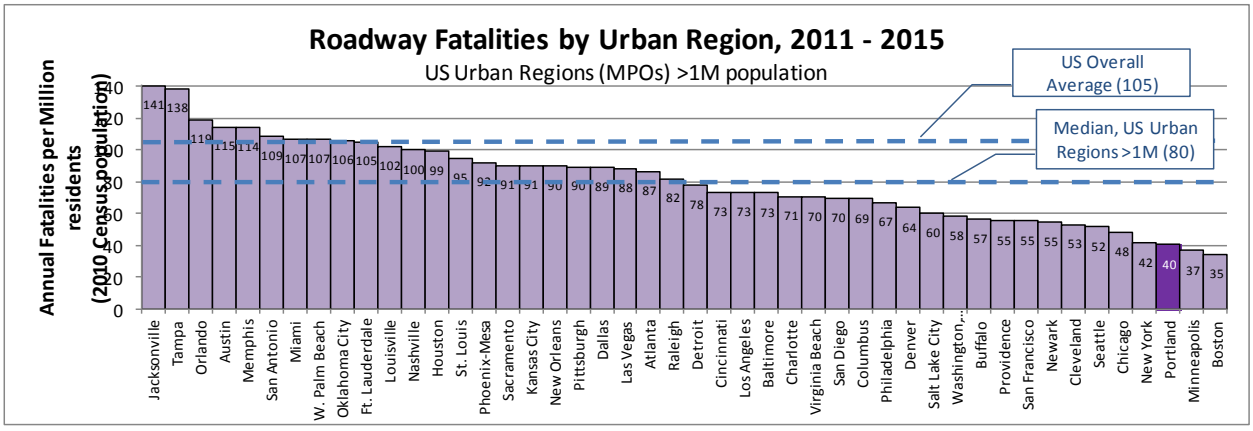


Figure 24: Roadway fatalities by urban region, 2011-2015
Source: Metro State of Safety Report, 2018

The City of Portland's fatality rates are higher than regional fatality rates, but both Portland and the region's fatality rates are lower than the State of Oregon (especially when the Portland region is excluded), and lower than the U.S. The greater Portland region has 39 fatalities per capita, Oregon has 88 fatalities per capita, and the U.S. has 109 fatalities per capita. The United Kingdom and European Union data are included for reference as international best practice.

2011 - 2015	Average Annual Fatalities	Population (2015)	Annual VMT (2015)	Annual Fatality rate per 1M residents	Fatality rate per 100M VMT
Metro	62.2	1,603,229	10,437,000,000	39	0.60
Median, regions >1M pop.*				*78*	n/a
City of Portland	31.8	620,540	4,303,000,000	51	0.74
*Median, cities >300,000 pop.**				*72*	n/a
Oregon	356	4,028,977	36,000,000,000	88	0.99
Oregon excl. Metro region	294	2,425,748	25,562,000,000	121	1.15
US	*35,092*	*321,418,820*	*3,095,373,000,000*	*109*	*1.13*
UK**	2,123	64,128,226	520,600,000,000	33	0.41
EU – 28**	32,463	506,592,457	4,322,500,000,000	64	0.75

* All data for other regions and cities is 2010 - 2014

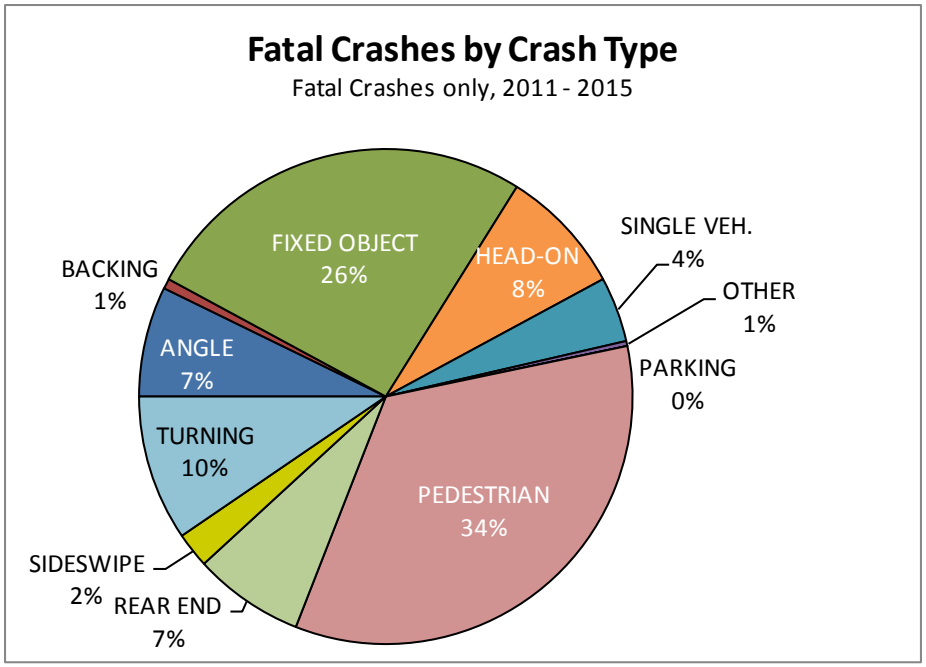
** All data for UK and EU is for year 2013

Figure 25: Metro crash rates per 100 million VMT and 1 million people, compared to other places, 2011-2015
Source: 2018 Metro State of Safety Report

There is a strong correlation between fatality rates and annual per capita vehicle miles traveled. States with higher vehicle miles traveled (VMT) typically also have higher per capita fatality rates, as the typical exposure to risk is increased. The District of Columbia has the lowest per capita VMT at 5,610, and exhibits one of the lowest annual fatality rates of 65 per million people – less than one-third of the national average. Wyoming, with the highest per capita VMT of 17,900, also has the highest annual fatality rate at 310 per million people– two-hundred thirty-five percent of the national average. The national average is 9,500 VMT per capita and 109 fatalities per million residents.

Oregon statistics are 8,650 VMT per capita (ninety-one percent of the national average) and 85 fatalities per million people (eighty-one percent of the national average). The greater Portland region statistics are 6,506 VMT per capita and 39 fatalities per million people. The City of Portland has a slightly higher VMT per capita at 6,934 and 51 fatalities per million people.

For all crashes, the most common fatal crash types were pedestrian and fixed object. The most common serious crash types were turning and rear end. For the purpose of establishing crash type, bicycles are considered vehicles, and so there is no separate bicycle crash type.



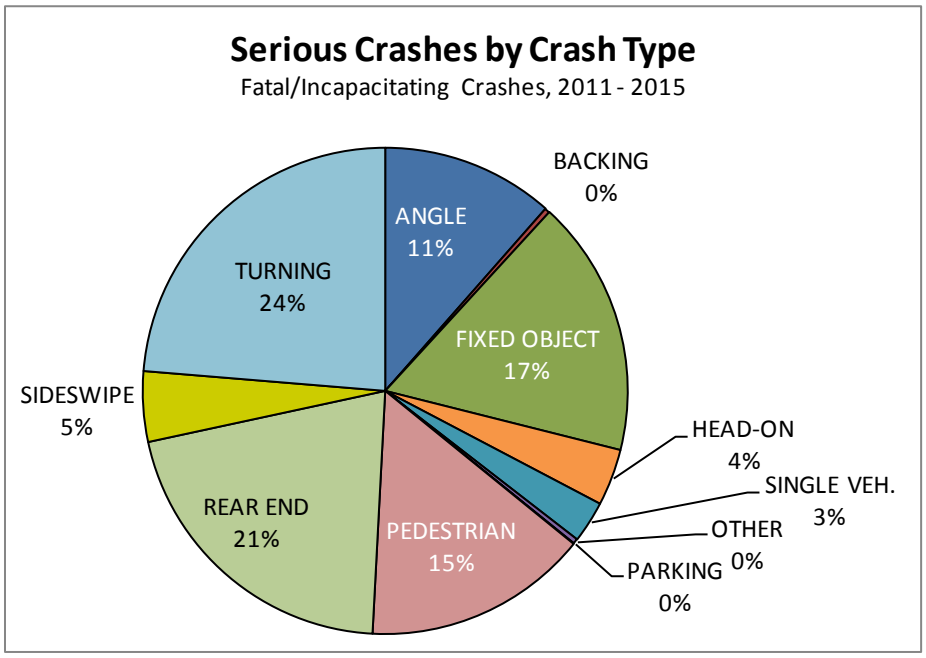


Figure 26: Serious and fatal crash types, 2011-2015
Source: 2018 Metro State of Safety report

A **pedestrian crash** results when the first harmful event is any impact between a motor vehicle in traffic and a pedestrian. It does not include any crash where a pedestrian is injured after the initial vehicle impact. Pedestrian is the most common fatal crash type in the region, and the most common crash type to be fatal. Pedestrian crashes constitute thirty-four percent of fatal crashes, fifteen percent of serious crashes, though only two

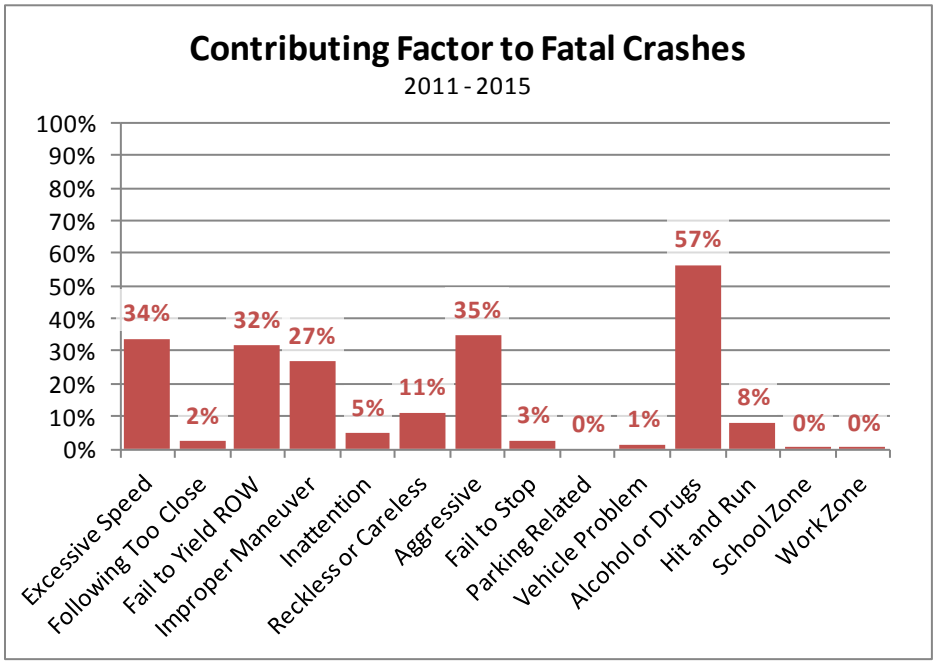
percent of all crashes in the region. Alcohol or drugs and failure to yield ROW are the most common contributing factors in serious pedestrian crashes.

A **fixed object crash** results when one vehicle strikes a fixed or other object on or off the roadway. Though not a common crash type, fixed object is the second most common fatal crash type in the region. Fixed object crashes constitute twenty-six percent of fatal crashes, seventeen percent of serious crashes, though only seven percent of all crashes in the region.

A **turning crash results** when one or more vehicles in the act of a turning maneuver is involved in a collision with another vehicle (including bicycles). Turning is the second most common crash type in the region, as well as the most common serious crash type. Turning crashes constitute ten percent of fatal crashes, twenty-four percent of serious crashes, and twenty-two percent of all crashes in the region.

Rear end crashes are the most common type of crash in the region. They are rarely fatal, but often serious. Rear end crashes constitute seven percent of fatal crashes, twenty-one percent of serious crashes, and forty-five percent of all crashes in the region. Aggressive driving, fail to stop, following too closely, and excessive speed are factors in a substantial proportion of serious and fatal rear end crashes.

Alcohol and drugs, excessive speed, fail to yield right-of-way, and aggressive driving (defined as excessive speed and/or following too close) are the most common factors in serious crashes. Each crash may have several contributing factors. Crashes involving alcohol and drugs have a much higher likelihood of being fatal than other crashes.



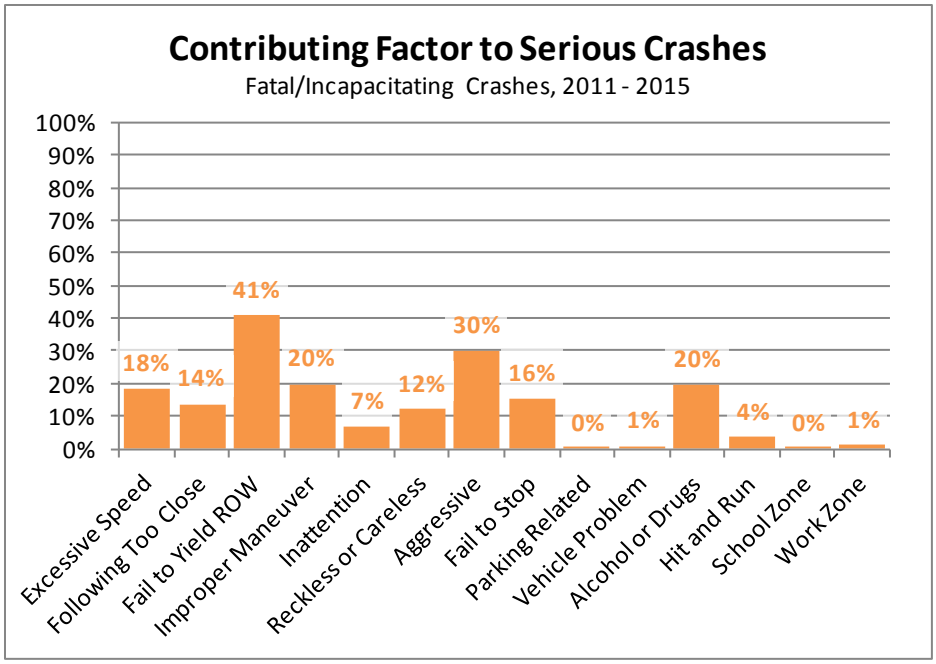


Figure 27: Serious and fatal crashes by contributing factor, 2011-2015
Source: 2018 Metro State of Safety Report

Traffic crashes contribute to congestion and cost the region more than congestion. Traffic deaths and life changing injuries impact the lives of our families, friends, neighbors and community members. They also have a major economic cost – estimated at $1 billion for our region. According to analysis conducted by Cambridge Systematics in a report for AAA of America, the total cost of crashes per person in the greater Portland-Vancouver region $1,220. The report found that in urbanized areas the total cost of traffic crashes is over three times the cost of congestion. In large urban areas, such as the greater Portland region, costs resulting from crashes are over three times more than congestion.[37] According to FHWA, in 2009 dollars, the cost of a single motor vehicle fatality is $6,000,000.[38]

3.3 Vulnerable users are at a higher risk

This section provides key findings for vulnerable users. Refer to the 2018 Metro State of Safety Report for additional information.

Vulnerable users can have higher fatality rates and are at greater risk of death or severe injury in the event of a crash. Vulnerable users are pedestrians, bicyclists, motorcycle operators, children, older adults, and road construction workers, people with disabilities, people of color and people with low income. Increasing safety for vulnerable users increases safety for all transportation users.

[37] Crashes vs. Congestion: What's the Cost to Society (November 2011) AAA and Cambridge Systematics.
[38] The 11 comprehensive cost components include property damage; lost earnings; lost household production (non-market activities occurring in the home); medical costs; emergency services; travel delay; vocational rehabilitation; workplace costs; administrative costs; legal costs; and pain and lost quality of life.

Slower speeds and pedestrian oriented design create a safe and welcoming street in downtown Lake Oswego

Crashes involving people on motorcycles, people walking and people riding bicycles tend to be more serious compared to auto-only crashes. Auto-only crashes comprise ninety-one percent of all crashes, and thirty-eight percent of all fatal crashes. Pedestrian crashes make up two percent of all crashes, and thirty-six percent of all fatal crashes. Motorcycle crashes comprise two percent of all crashes, and eighteen percent of all fatal crashes, and bicycle crashes comprise two percent of all crashes and four percent of fatal crashes. Figure X shows all reported crashes and serious crashes by mode.

	Pedestrians		Bicyclists		Autos Only		Motorcycle		Truck Involved	
Year	All Injury	Serious	All Injury	Serious	All Injury	Serious	All Injury	Serious	All Injury	Serious
2011	418	65	481	32	10,502	412	312	72	250	20
2012	511	88	560	37	10,622	359	353	63	277	16
2013	428	67	485	33	9,607	327	356	76	238	11
2014	480	81	509	38	10,179	320	302	55	281	22
2015	474	81	477	35	12,129	429	339	86	320	19
METRO	**2,311**	**382**	**2,512**	**175**	**53,039**	**1,847**	**1,662**	**352**	**1,366**	**88**

Figure 28: All reported crashes, by mode and year
Source: 2018 Metro State of Safety Report

Pedestrian crashes are the most common type of fatal crash. There were an average of 62 traffic related deaths between 2011 and 2015. More than one third of those deaths were pedestrians.

Pedestrian crashes have the highest severity of any crash type. A pedestrian crash is more than twenty-six times as likely to be fatal than a crash not involving a pedestrian, and more than 110 times as likely to be fatal as a rear end crash, the most common crash type.

Pedestrian deaths are increasing. Serious pedestrian crashes increased somewhat over the 5-year period. Pedestrian fatalities have steadily increased to 2015. If the region continues in its trend of pedestrian deaths will continue to rise. Figure x below shows the linear trendline for pedestrian deaths and life changing injuries if changes are not made. Similar figures in Chapter 6 show a steep decline in motor-vehicle only serious crashes.

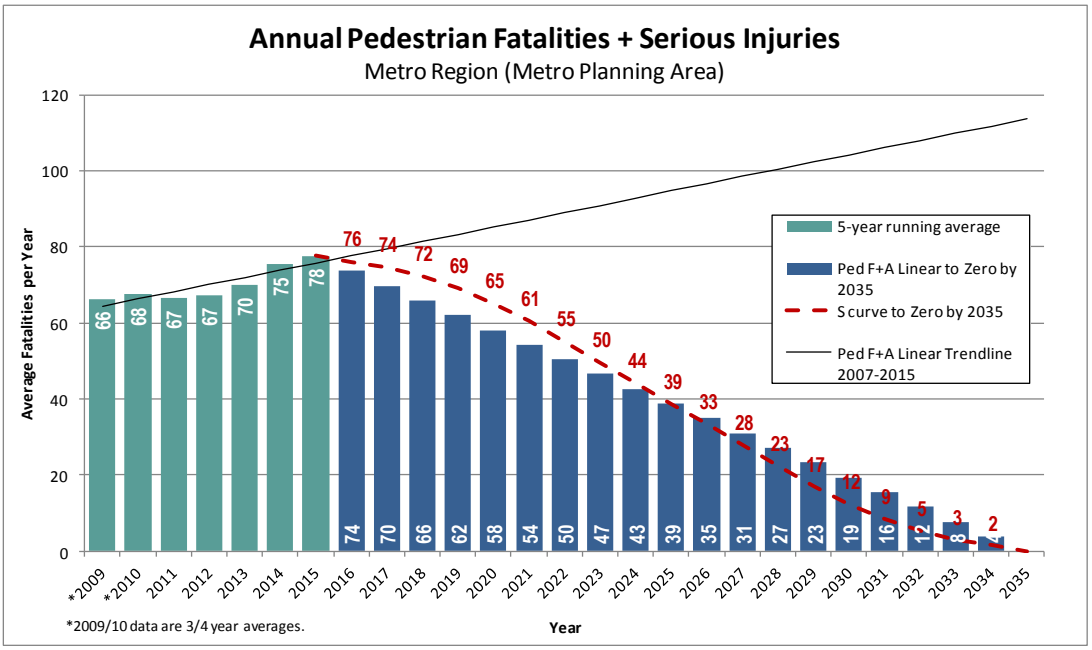


Figure 29: Trend of annual pedestrian fatalities and serious injuries, 2011-2015

Pedestrian safety is not the same across the region. The City of Portland has the highest number of annual pedestrian deaths, and Gladstone, Gresham and Portland have the highest serious pedestrian crash rate per capita. Happy Valley, West Linn and Tualatin have the lowest serious pedestrian crash rate per capita.

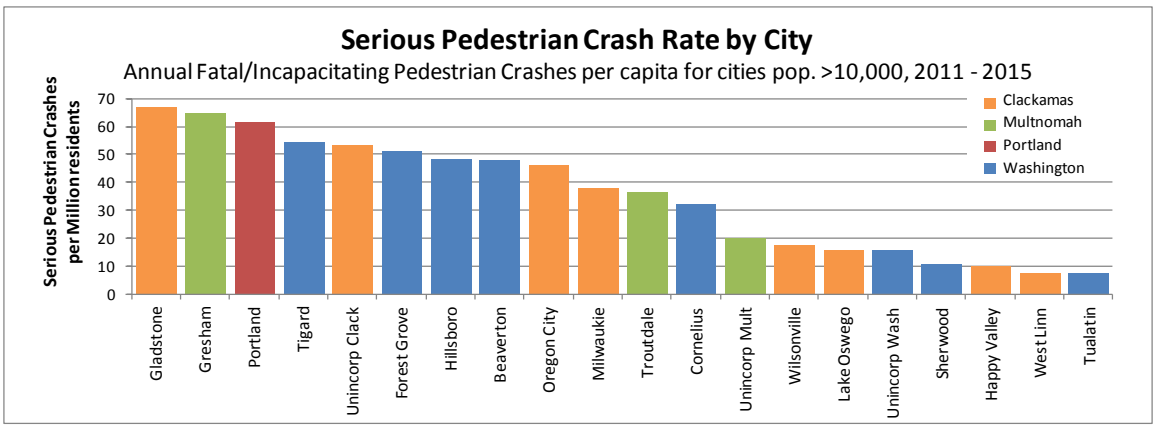


Figure 30: Serious pedestrian crash rate by city, per capita
Source: 2018 Metro State of Safety Report

A majority serious pedestrian crashes occur in areas with higher densities of people of color, people with low incomes and English language learners. Sixty-one percent of pedestrian deaths and sixty-six percent of severe injury pedestrian crashes occur in these areas, while only thirty-nine percent of the region's population lives in these areas. Data is not available on the race and ethnicity or income of the people killed or severely injured.

Fatality rates for pedestrians are more than three times as high in neighborhoods where more than a quarter of the population lived in poverty. There were 12.8 pedestrian deaths per 100,000 residents, compared to 3.5 pedestrian deaths per 100,000 residents, in areas with poverty rates below the national rate of fifteen percent.[39]

Your risk of dying in a motor-vehicle involved crash is higher if you are a person of color, are over 65 or have a lower income.[40] While no published national or Oregon data assesses the income or poverty status of those killed in traffic crashes, multiple analyses on the location of crashes confirms that in poorer areas and in communities of color risk of death from a traffic crash is higher. A report published in 2013 by the Centers for Disease Control and Prevention examined mortality data from 2001-2010 and found racial and ethnic minorities recorded higher annualized death rates. People 75 and older also had significantly higher death rates in the study.

The 2016 Dangerous by Design report found that African Americans and Latinos are twice as likely to be killed as a pedestrian in a traffic crash. Bridging the Gap, a program of the Robert Wood Johnson Foundation, conducted field research measuring the presence of sidewalks, lighting, crosswalks and traffic calming devices in 154 communities. The

[39] Governing, 2014
[40] *Motor Vehicle Traffic-Related Pedestrian Deaths — United States, 2001–2010*, Centers for Disease Control and Prevention (2013); *Dangerous by Design*, National Complete Streets Coalition (2016); *Income Disparities in Street features that Encourage Walking*, Bridging the Gap (2012); *Pedestrians Dying at Disproportionate Rates in America's Poorer Neighborhoods*, Governing, August 2014; *America's Poorer Neighborhoods Plagued by Pedestrian Deaths*, Governing Research Report (August 2014)

resulting study, "Income Disparities in Street Features that Encourage Walking," found such infrastructure was more common in high-income communities.

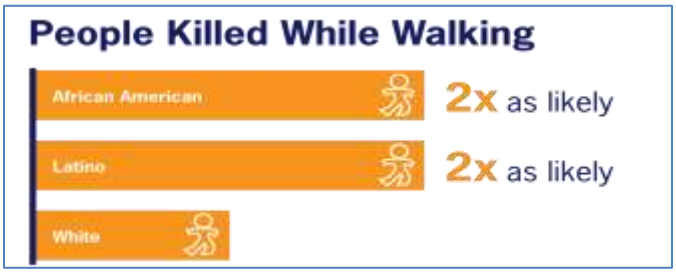


Figure 31: National pedestrian traffic deaths, 2008-12, and race by census tract
Source: Dangerous by Design, 2011 and Safe Routes to School National Partnership

Figure 32: National pedestrian traffic deaths, 2008-12, and census tract per capita income
Source: Governing, 2014 and Safe Routes to School National Partnership

In Oregon, American Indians/Alaska Natives have the highest average rate of vehicle related deaths (5.9 per 100,000) 1.8 times the rate among whites (3.3 per 100,000), and American Indians/Alaska Natives and Black or African American had the highest hospitalization rate - 52.2 and 46.2 per 100,000, compared to 45.5 for whites and 20.8 Asian Pacific Islander for traffic related injuries.[41] This data is not currently available at the regional level.

A majority of Regional High Injury Corridors are in communities with higher concentrations of people of color, people with low incomes and English language learners. In the greater Portland region a majority of high injury corridors and intersections are in communities of color and low-income communities, and forty percent are in communities that are both low-income and communities of color. Refer to the map of Regional High Injury Corridors and Intersections in Chapter 2 to see how they overlap with race and income marginalized communities.

[41] Oregon Public Health Authority, 2008-2014 crashes

	% high injury corridors	Corridor miles	% high injury intersections	Number of intersections
Communities of color & English language learner	50%	250	51%	71
Low-income communities	54%	268	75%	104
Overlap of communities of color, English language learner and low-income	40%	198	46%	64
Region-wide	100%	499	100%	138

Figure 33: Overlap of regional high injury corridors & intersections, communities of color, English language learners, and low-income communities Source: Metro Equity Analysis, 2018

Older drivers are twice as likely to die in a traffic crash. For male drivers age 70 to 79 and female drivers age 75 to 85 and older, the share of serious crashes is double that of drivers in other age groups.

	Total Male Drivers (2011 – 2015)			Total Female Drivers (2011 – 2015)		
Age Group	**All Crashes**	**Serious**	**Percent Serious**	**All Crashes**	**Serious**	**Percent Serious**
14-17	3,076	17	0.6%	3,579	42	1.2%
18-21	9,572	99	1.0%	9,413	93	1.0%
22-24	7,518	91	1.2%	7,466	77	1.0%
25-29	12,431	96	0.8%	11,968	123	1.0%
30-34	11,897	114	1.0%	10,804	105	1.0%
35-39	10,343	122	1.2%	9,247	67	0.7%
40-44	10,421	63	0.6%	8,898	86	1.0%
45-49	9,218	87	0.9%	8,053	70	0.9%
50-54	9,114	77	0.8%	7,500	43	0.6%
55-59	8,248	115	1.4%	6,810	53	0.8%
60-64	6,734	66	1.0%	5,529	38	0.7%
65-69	4,589	41	0.9%	3,823	38	1.0%
70-74	2,408	48	2.0%	2,180	22	1.0%
75-79	1,428	33	2.3%	1,306	24	1.8%
80-84	820	4	0.5%	813	21	2.6%
85+	747	10	1.3%	777	15	1.9%
Unknown	15,669	16	0.1%	11,098	14	0.1%
METRO	**124,233**	**1,099**	**0.9%**	**109,264**	**931**	**0.9%**

Figure 34: Age and gender of drivers involved in crashes, regardless of fault
Source: Metro 2018 State of Safety Report

For young people below the age of 25, motor vehicle crashes are a leading cause of death and the leading cause of years of life lost. Traffic crashes are the leading cause of unintentional injury death for people ages 5 to 24 in Multnomah, Washington and Clackamas County, and the second leading cause of unintentional injury death for people ages 25 to 84.[42]

Serious bicycle crashes are on a downward trend. Serious bicycle crashes have fluctuated over the 5-year period and fatal crashes have declined. Figure x below shows the linear trendline for bicyclist deaths and severe injuries. A better understanding of what has contributed to this positive direction should be developed to continue the investments, programs, or other elements that have made it safer to ride a bicycle in the region.

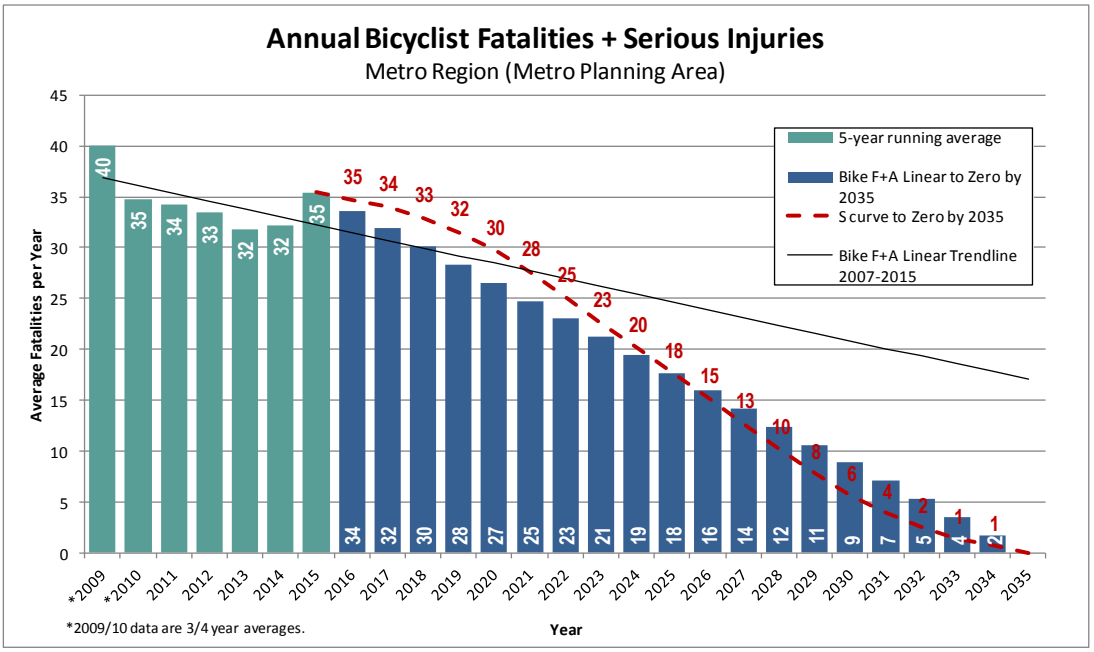


Figure 35: Annual Bicycle Fatalities and Serious Injuries

[42] Oregon Death Certificates: Center for Health Statistics, Center for Public Health Practice, Public Health Division, Oregon Health Authority. Accessed March 13, 2018. For 2012-2016. Unintentional injuries were the 4th leading cause of death (just about tied for third with cerebrovascular disease/stroke); within the category of unintentional injury deaths, transport injuries are the third leading cause behind falls and poisoning (poisoning includes drug overdoses).

Motorcyclist fatalities and severe injuries are increasing. While all injury motorcycle crashes have remained relatively flat between 2011 and 2015, serious motorcycle crashes are trending upward. Motorcycle crashes tend to be severe. Motorcycle crashes comprise two percent of all crashes, and eighteen percent of all fatal crashes.

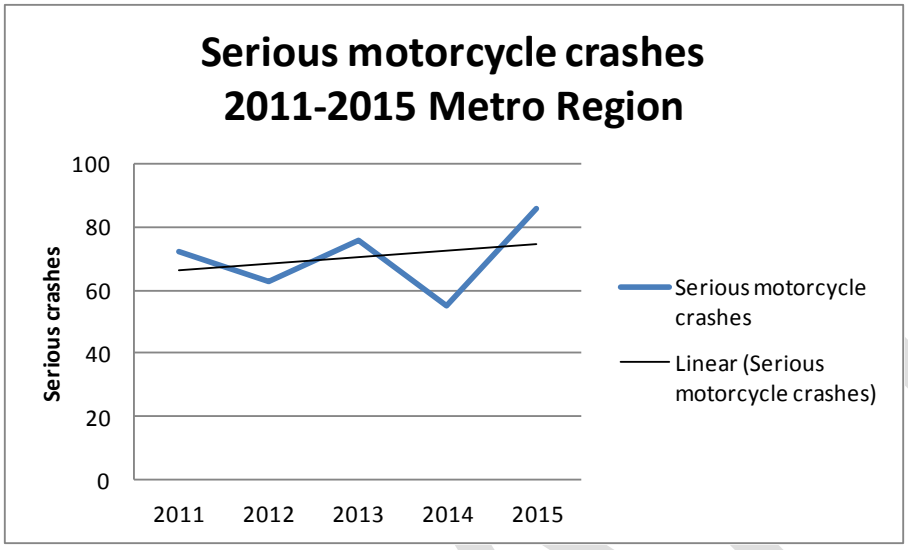


Figure 36: 2011-2015 ODOT crash data

3.4 Roadway design is a factor in serious crashes

This section provides key findings for the relationship between roadway design and serious crashes. Analysis of the regional roadway network included functional classification, number of lanes, and vehicle miles traveled by functional class. Other design elements of the roadways, such as presence of biking and walking facilities and degree of separation, on-street parking, access management, median separation, enhanced crossings, or presence or absence of street lighting were not included the analysis. These types of design elements can enhance safety for all modes. Future analysis should include these elements to help illustrate that not all arterial roadways have the same safety issues. Additional analysis could also look at major roadways where no serious crashes are occurring to develop an understanding of what characteristics those roads have. Refer to the 2018 Metro State of Safety Report for additional information.

Arterial roadways have the highest serious crash rate per road mile and per vehicle mile traveled. Analysis of the crash data provide information on the type of roadways where most fatal and severe crashes are occurring. The analysis found that a majority of fatal and severe crashes are occurring on arterial roadways.

Roadway Classification	Total Road-Miles	Annual VMT (2015)	Annual Crashes per Road-Mile		Annual Crashes per 100M VMT	
			All Injury	Serious	All Injury	Serious
Freeway	304	4,455,000,000	5.9	0.16	40	1.1
Arterial	772	4,281,000,000	9.8	0.41	176	7.4
Collector	994	1,081,000,000	1.7	0.09	158	8.2
Local	4,565	620,000,000*	0.1	0.01	87	4.3
METRO	**6,635**	**10,437,000,000**	**1.7**	**0.07**	**111**	**4.6**

*** VMT for local streets is a low-confidence estimate**

Figure 37: Annual crashes per road mile and VMT by functional class, 2018 Metro State of Safety Report

Arterial roadways have the highest percentage of serious crashes. Seventy-three percent of the region's non-freeway serious crashes, sixty-six percent of all serious crashes (including freeways), seventy-seven percent of the serious pedestrian crashes, and sixty-five percent of the serious bike crashes occur on arterial roadways (arterial roadways comprise twelve-percent of the non-freeway roadway network).

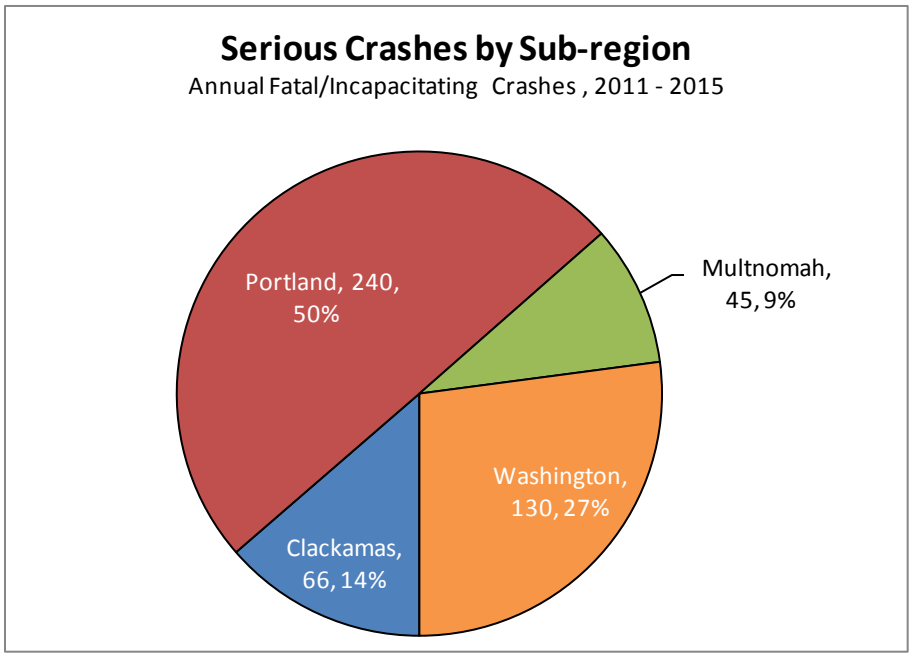


Figure 38: Serious crashes by roadway class
Source: 2018 Metro State of Safety Report

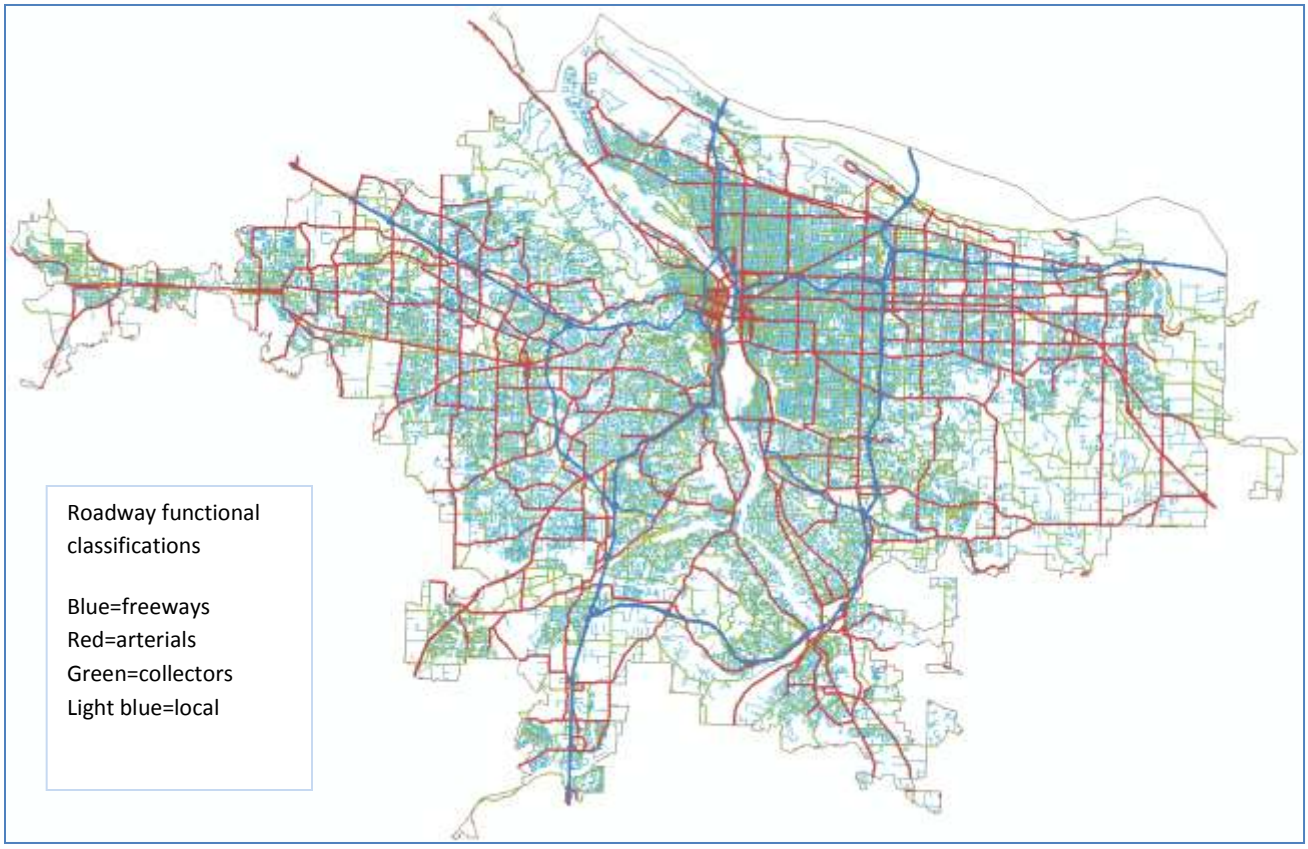


Figure 39: Roadway functional classifications in the greater Portland region

Most Regional High Injury Corridors are arterial roadways. Sixty percent of all fatal and severe injury crashes occur on just six percent of the region's roadways. These roadways are identified as Regional High Injury Corridors and Intersections. Many of these roadways also have the characteristics of high risk corridors, and a majority of these roadways are frequent transit corridors.[43]

Streets with more traffic lanes have higher fatal and severe injury crash rates per mile. Roadways with more traffic lanes have higher fatal and severe injury bicycle crash rates per mile. The serious bicycle crash rate per road mile increases dramatically for roadways with 4 or more lanes. When normalized by motor vehicle traffic volume, the serious bike crash rate on narrower roads is higher than on wider roads. While the reason for this is not clear from the data, it may be related to a higher use of narrower roads by cyclists relative to traffic volume as compared to multi-lane roadways.

Wider roadways are the location of a disproportionate number of serious crashes in relation to both their share of the overall system and the vehicle-miles travelled they

[43] Characteristics if high risk roads are identified by looking at crash history on an aggregate basis to identify particular severe crash types (e.g. pedestrian) and then use the roadway characteristics associated with particular crash types (e.g. arterial roadways with four-or more lanes, posted speed over 35 mph, unlit streets) to understand which roadways may have a higher risk of the same type of severe crash.

serve. Fifty-four percent of fatal and severe crashes occur on roadways with 4 or more traffic lanes. Roadways with 4 or more traffic lanes comprise nineteen percent of the regional roadway network. Wider roadways are particularly hazardous to pedestrians. The serious pedestrian crash rate increases dramatically for roadways with 4 or more lanes. Even when normalized by motor vehicle traffic volume, the serious pedestrian crash rate on wider roadways is still substantially higher than on narrower roads. This follows trends documented in AASHTO's Highway Safety Manual. Roads with more lanes have an especially high serious crash rate for pedestrians, producing higher crash rates per mile and per vehicle mile traveled as compared to other modes.

Intersection design is critical to bicycle safety. A majority of fatal and severe injury bicycle crashes occur at an intersection, and fail-to-yield right-of-way is the top contributing factor in serious bicycle crashes. Seventy-three percent of serious bicycle crashes occurred at an intersection, compared to forty-nine for all serious crashes for all modes. Fail to yield to right-of-way was a contributing factor in eighty-two percent of serious bicycle crashes and fifty percent of fatal bicycle crashes. The data do not specify whether the driver, the bicyclist, or both were under the influence of alcohol. Other factors, such as Fail to Yield ROW, Excessive Speed, and Aggressive Driving, are for the driver.

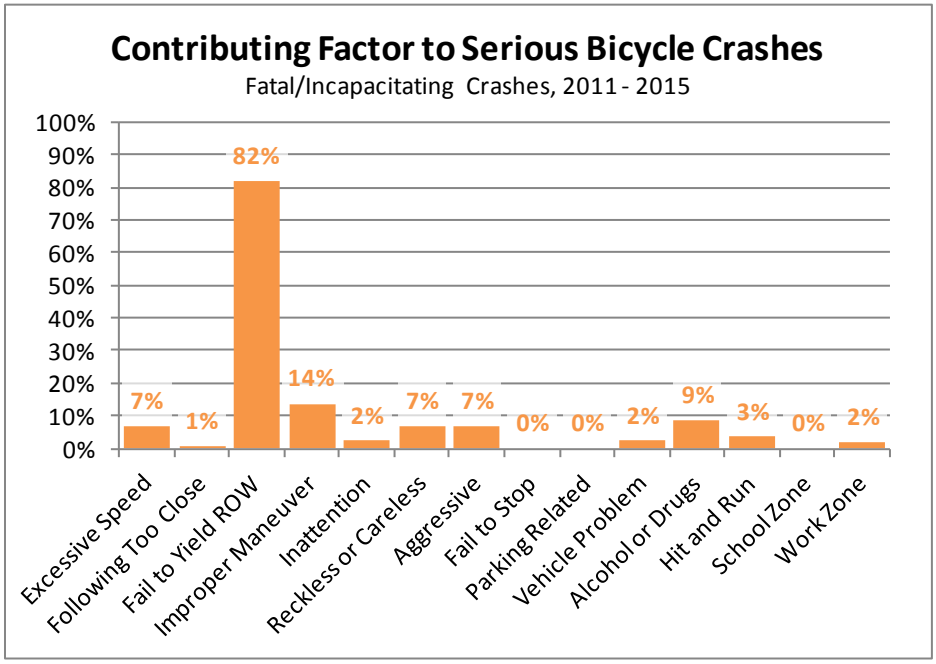


Figure 40: 2018 Metro State of Safety Report

Crash factors differ by roadway type. For freeway crashes, alcohol and drugs is the most common factor for fatal crashes and aggressive driving is the most common factor for serious crashes. For non-freeway crashes, alcohol or drugs is the most common factor for fatal crashes and fail to yield right-of-way is the most common factor for serious crashes.

Serious pedestrian crashes are disproportionately represented after dark. While thirty-nine percent of all serious crashes happen at night, sixty-four percent of serious

pedestrian crashes happen at night, indicating that visibility of pedestrians is an important safety feature.

3.5 Speed and speeding are major factors in serious crashes

This section provides key findings related to speeding.[44] Refer to the 2018 Metro State of Safety Report for additional information.

Speed is a fundamental contributing factor in crash severity. Crashes involving higher speeds will tend to increase the severity of the crash and likelihood of death. Reducing speeds and preventing speeding saves lives. On average, 1,000 Americans are killed every month in speed-related crashes. In Oregon, speeding is the most common behavioral issue associated with fatal and serious injury crashes.

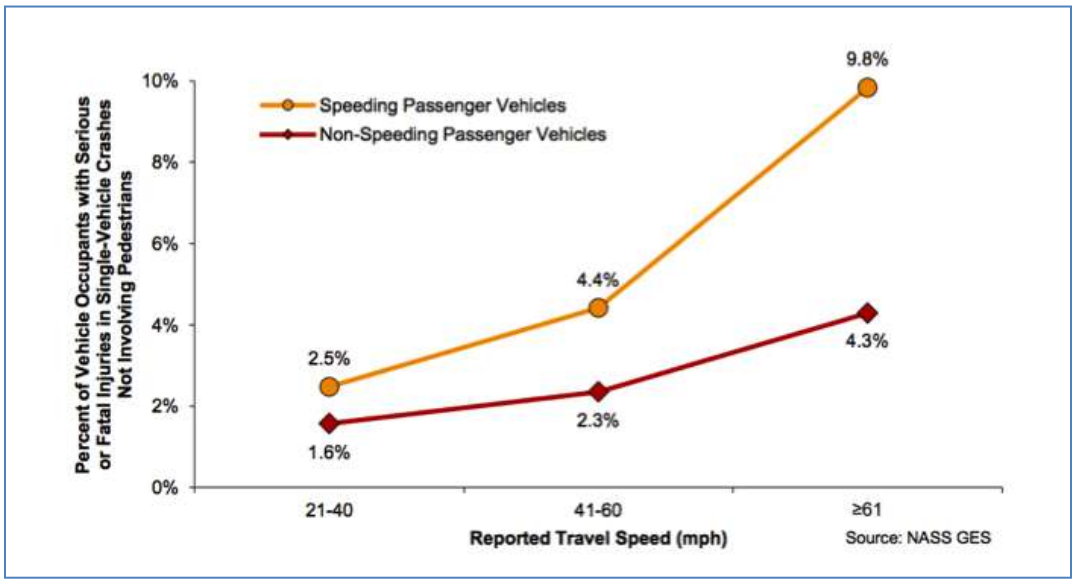


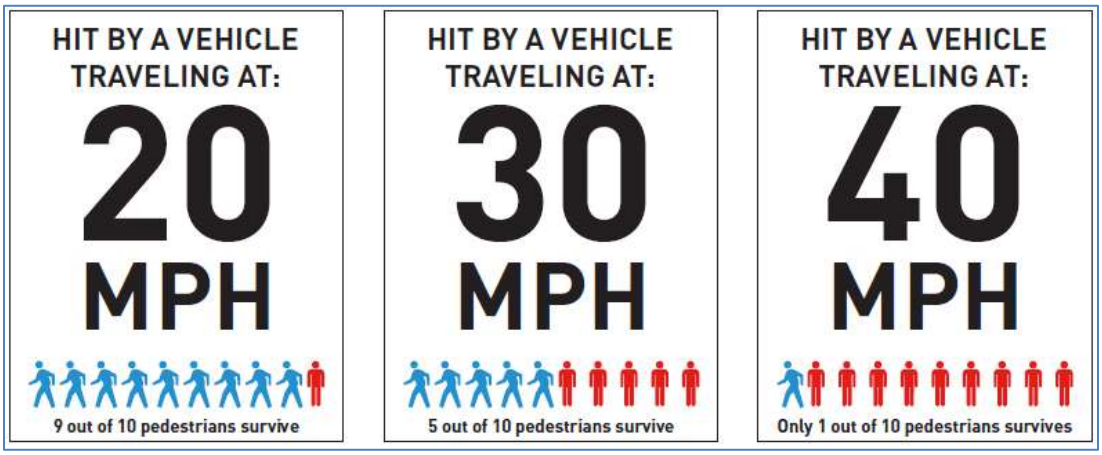
Figure 41: Percent of passenger vehicle occupants sustaining serious or fatal injuries in speeding-related and all crashes, by reported travel speed, 2014
Source: National Automotive Sampling System (NASS) General Estimates System (GES)

Crash severity increases with the speed of the vehicle at impact. Inversely, the effectiveness of restraint devices like air bags and safety belts, and vehicular construction features such as crumple zones and side member beams decline as impact speed increases. The probability of death, disfigurement, or debilitating injury grows with higher speed at impact.

Pedestrians, bicyclists and motorcyclists are more vulnerable to dying or being seriously injured in a speed related crash. Nine out of ten pedestrians will survive being

[44] In the 2018 Metro State of Safety Report, Excessive speed is defined as speed too fast for conditions; driving in excess of posted speed; speed racing; failed to decrease speed for slower moving vehicle. Fatal and severe crashes occurring at higher speeds, but not fitting these definitions, are not counted as speed-related crashes.

hit by a vehicle traveling 20 mph, whereas only one out of ten pedestrians will survive being hit by a vehicle traveling 40 mph.



Source: Vision Zero Network

Alone or in combination with other factors, excessive speed is a major factor in fatal and severe injury crashes. While seven percent of all crashes involve speed as a factor, speed is a major factor in thirty-four percent of fatal and severe crashes. Ninety-seven percent of serious speed related crashes involved aggressive behavior, and thirty-eight percent involved alcohol. Forty-one percent of fatal freeway crashes involve excessive speed. Thirty-five percent of fatal crashes involved aggressive behavior, defined as either excessive speed or following too close.

A majority of excessive speed related serious crashes occur on arterial roadways. Fifty-five percent of serious excessive speed related crashes occurred on an arterial roadway, and seventy-one percent occurred at a non-intersection.

3.6 Aggressive and distracted driving are major factors in serious crashes

This section provides key findings aggressive and distracted driving related crashes. Refer to the 2018 Metro State of Safety Report for additional information.

Dangerous behaviors include those that arise from aggressive or distracted driving. Dangerous behaviors arising from aggressive and distracted driving include failing to yield the right of way, following too close, and excessive speed.

Distracted driving is any activity that diverts attention from driving, including talking or texting on the phone, eating and drinking, talking to people in the vehicle, fiddling with the stereo, entertainment or navigation system—anything that takes attention away from the task of safe driving. Texting is the most alarming distraction. Sending or reading a text takes your eyes off the road for 5 seconds. At 55 mph, that's like driving the length of an entire football field with your eyes closed.

Cell phone use while driving is a growing concern in transportation safety. Drivers use their cell phones 88 out of 100 trips (analysis of 570 million trips in US). On average, more than 8

people are killed and 1,161 more are injured in crashes involving a distracted driver each day in the U.S. In 2015, the number rose to 10 people every day.

Based on limited data, Oregon appears to have the lowest rate of driving and cell phone use in the country; states with hands free cell phone laws have lower rates of cell phone use while driving and it can be assumed lower distracted driving related crashes.

Distracted driving crashes occur frequently. On average, a crash involving a distracted driver occurs every 2.5 hours in Oregon.[45]

A majority of drivers in Oregon drive distracted. In Oregon, seventy-five percent of drivers drive distracted when alone, and forty-four percent when driving with passengers. [46] A national study found that drivers sue their phones during eighty-eight out of 100 trips.[47]

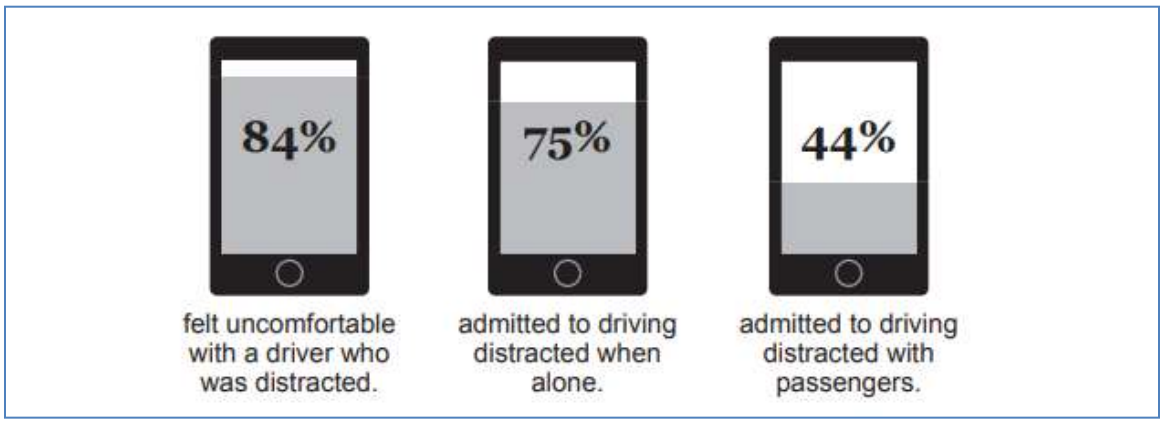


Figure 42: Distracted driving in Oregon
Source: Reducing Distracted Driving in Oregon, ODOT 2017

Dangerous behaviors are a major contributing factor in fatal and severe injury crashes. Aggressive driving is a factor in thirty-six percent of fatal crashes. Forty percent of serious crashes are fail to yield right of way involved.

Aggressive behavior is a major contributing factor in auto only crashes, compared to other modes. Forty-one percent of auto-only serious crashes involved aggressive behavior, compared to nine percent of pedestrian involved crashes and eight percent of bicycle involved crashes. Sixty-four percent of serious freeway crashes involved aggressive behavior.

[45]

[46] Southern Oregon University. Distracted Driving: An Epidemic, A Study of Distracted Driving Attitudes, Behaviors and Barriers Preventing Change (2016). — www.oregon.gov/ODOT/Documents/Distracted Driving

[47] *Zendrive Research: Largest Distracted Driving Behavior Study.* (April 2017) http://blog.zendrive.com/distracted-driving/ The research analyzed 5.6 billion miles, 570 million trips and 3 million drivers

Aggressive behavior is a major contributing factor in rear end crashes, the second most common type of serious crashes. Rear end crashes account for twenty-one percent of serious crashes, and seventy-three percent of those crashes involved aggressive behavior.

3.7 Alcohol and drugs are major factors in serious crashes

This section provides key findings for crashes involving drugs and alcohol. Refer to the 2018 Metro State of Safety Report for additional information.

Crashes involving alcohol and drugs have a much higher likelihood of being fatal than other crashes. Fifty-seven of fatal crashes involved alcohol or drugs, while five percent of al crashes involved alcohol and drugs.

Nationally, the percentage of fatally injured drivers who were drinking was highest for Native Americans (57%) and Hispanics or Latinos (47%). [48]

A majority of serious alcohol and drug involved crashes are auto only crashes. Fifty-six percent of serious alcohol involved, and fifty-seven of serious drug involved crashes are auto-only crashes.

Pedestrian crashes have a high likelihood of involving alcohol or drugs. Thirty-eight percent of serious pedestrian crashes are alcohol and/or drug involved. Twenty-seven percent of serious alcohol involved, and twenty-nine percent of serious drug involved crashes are pedestrian involved.

[48] This report looks at two primary figures – fatalities per VMT (by age and ethnic group) and CIR of male drivers by the same categories. Both figures point to higher numbers for people of color. The report offers some potential cultural explanations for the stark differences, none of which were numerically proven – the consensus though is that something needs to be done to address these differences but the proper route for creating change is unknown at this time. NHSTA, 2006

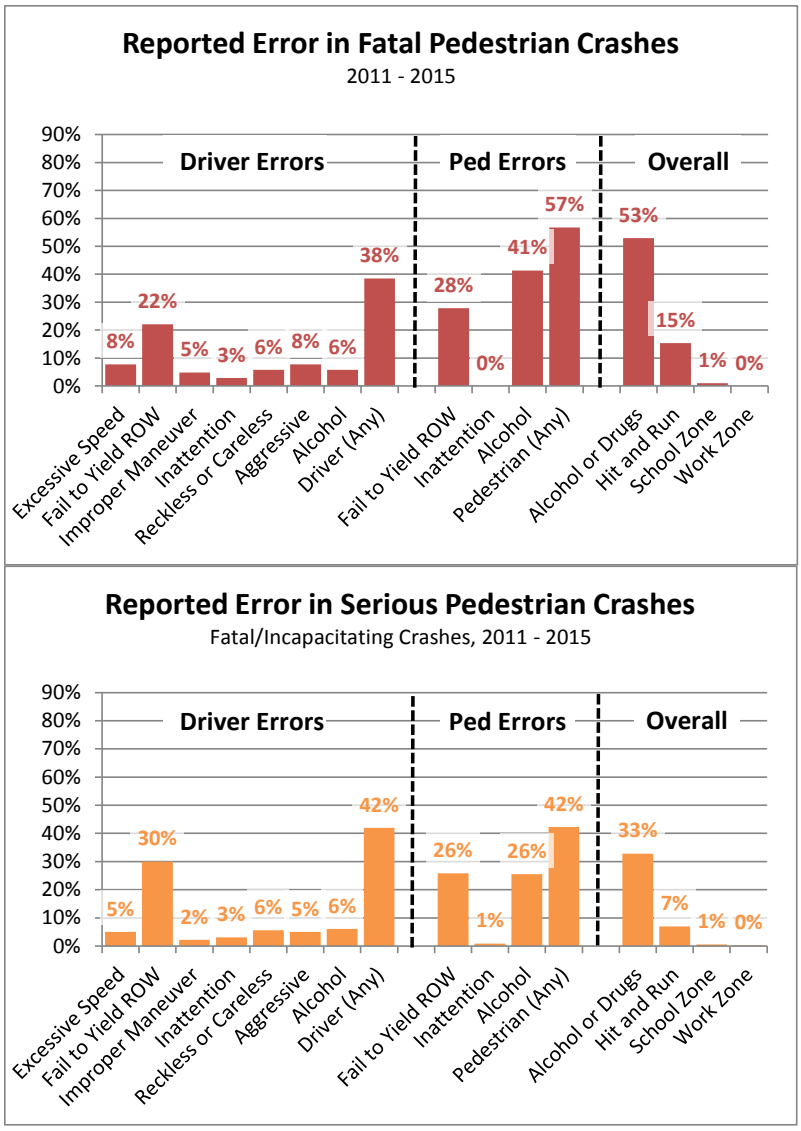


Figure 43: 2018 Metro State of Safety Report

The majority of serious alcohol and drug involved crashes occur at night. Seventy-seven percent of serious alcohol involved, and fifty-six percent of serious drug involved crashes occurred at night.

CHAPTER 4 STRATEGIES AND ACTIONS

The actions in the Regional Safety Strategy are based as much as possible on evidence-based counter measures. Data-driven transportation safety plans identify strategies and actions to address the most common causes and types of fatal and serious injury crashes identified through analysis of crash data.

Traffic safety problems are systemic. Addressing safety therefore requires a comprehensive systemic response that includes an array of evidence based actions. The Safe System approach provides a framework for strategies and actions that starts with safe travel for all, including reducing disparities for people of color and people with low incomes and for people walking and bicycling.

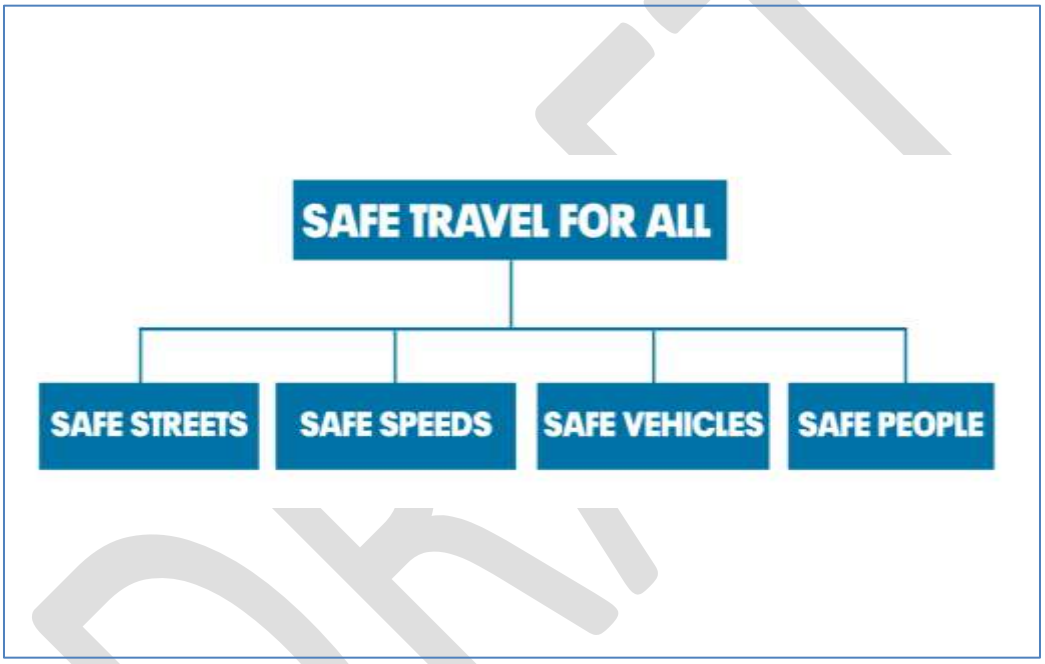


Figure 44: Vision Zero Safe System approach
Source: Vision Zero Network

The six strategies in the Regional Safety Strategy are of equal importance and represent a multi-pronged approach to reducing fatal and severe crashes in the region. Consistent with the Safe System approach the strategies and actions emphasize systemic solutions and de-emphasize individual behavior change, especially enforcement.

- **Enforcement related actions raise equity concerns** because of the potential disproportionate impact on people of color and people with low income.[49] While

[49] *A Billionaire and a Nurse Shouldn't Pay the Same Fine for Speeding.* New York Times (March 15, 2018)
The Constitutionality of Income-Based Fines. Alec Schierenbeck, University of Chicago Law Review, forthcoming (March 2, 2018)
The High Costs of Disparities for People of Color in Multnomah County, Lee Van Der Voo & Nick Budnick. (2017). http://invw.org/2017/02/02/being-black-in-multnomah-county/ This review found that

high visibility enforcement of speeding, impaired and distracted driving have been proven to be effective at reducing those types of crashes, the potential equity impacts must be weighed against the benefits. The enforcement actions in the Regional Safety Strategy prioritize automated enforcement and education. Action 4.1 which does recommend targeted enforcement also recommends taking actions to reduce disproportionate impacts either from racial profiling or fines.

- **Increasing personal security**, such as protection from harassment and violence on the street, is recognized as an important element of transportation safety. However it is beyond the scope of the Regional Safety Strategy to identify specific actions to address personal security.

Strategies and actions for the Regional Safety Strategy were developed with the recognition of existing city, county and state transportation safety and transportation plans as the foundation for reaching regional safety targets, goals and objectives.

The Regional Safety Strategy strategies and actions are recommended best practices, but are not mandated.

Implementation is contingent on the availability of funding and political will.

Strategies are broad areas of action designed to achieve an overall aim. The strategies identified respond to the most common causes of fatal and severe crashes in the region and the most common crash types. Each of the six strategies identifies specific recommended actions.

Actions are specific steps that a variety of partners can take to address specific safety problems. Actions in the Regional Safety Strategy were identified from multiple sources, including state and local transportation safety action plans, research of current best practices to address the primary factors in fatal and serious crashes.

Leads and partners for each action leads are identified for each action. A full list of partners with a role in transportation safety is provided at the end of the document. Many of the actions require multiple partners and/or could be implemented in various ways depending upon the lead agency or agencies. Actions where Metro is identified a lead agency indicates that Metro has committed taking steps to implement that action.

The effectiveness of each action to reduce fatal and severe injury crashes, based on research and studies, is noted.

white residents charged in relatively minor cases in Multnomah County — those with a single count — paid a median fine of $181, while African-American defendants paid $261.

- Proven = proven to be effective based on several evaluations with consistent results
- Recommended = generally accepted to be effective based on evaluations or other sources
- Unknown = limited evaluation or evidence; experimental; outcomes inconsistent or inconclusive among studies

One recent study provided a Traffic Safety Best Practices Matrix that identifies strategies and actions that can best help implement Vision Zero and the Safe System approach that was especially useful.[50] Proven safety countermeasures included in the actions have been documented by the Federal Highway Administration and/or the Oregon Department of Transportation.[51]

Timing of implementing actions

Many of the actions are currently being implemented to varying degrees by some agencies and jurisdictions. Expanding the number of jurisdictions utilizing proven tools to reduce fatal and severe injury crashes is critical to implementing the Regional Safety Strategy.

While some of the actions, such as enacting safety legislation or updating plans are short term, many of the actions will require ongoing implementation and resources, such as convening safety work groups and education programs, to be successful. Early and aggressive implementation of the strategies and actions will result in more lives saved. When the Regional Safety Strategy is reviewed each time the Regional Transportation Plan is updated the timing and number of actions should be refreshed.

4.1 Protect vulnerable users and reduce disparities

Vulnerable users have higher fatality rates. Increasing safety for vulnerable users increases safety for all transportation users and will reduce disparities.

Vulnerable users are people that are more vulnerable to being killed or seriously injured in crashes. Vulnerable users are pedestrians, bicyclists, motorcycle operators, children, older adults, road construction workers, people with disabilities, people of color and people with low income.

This strategy is focused on protecting users of the transportation system who are more vulnerable to dying or being seriously injured. Research and practice has shown that

Actions for this strategy are focused on proven and recommended programs and education and data collection and monitoring that result in roadways that are safe for the youngest, oldest and most vulnerable users of the transportation system. These actions

[50] *A Vision for Transportation Safety: Framework for Indentifying Best Practice Strategies to Advance Vision Zero.* Arielle Fleisher, Megan Wier, and Mari Hunter. Transportation Research Record: Journal of the Transportation Research Board, No. 2582. (2016)

[51] https://safety.fhwa.dot.gov/provencountermeasures and www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/docs/pdf/CRF_Appendix.pdf

compliment the other strategies, especially the reduce speeds and speeding and designing roadways for safety strategies.

#	Strategy ❶ Actions	Lead	Partners	Effectiveness
1.1	Implement Safe Routes to School programs and infrastructure projects, prioritizing schools in areas with higher concentration populations of people with lower incomes, people of color, and low English proficiency.	ODOT, Metro, cities and counties	Schools, public health, advocates	Recommended
1.2	Provide culturally and age appropriate on-going education of traffic laws and street designs.	ODOT, cities and counties, advocates, public health	Advocates, Metro	Recommended
1.3	Increase opportunities to provide education and products to increase visibility of people walking and bicycling (e.g. lights, reflective materials).	ODOT, cities and counties, schools	Public health, advocates	Recommended
1.4	Continue to improve data collection and reporting of vulnerable users, including: • Collecting and making crash data on race and ethnicity of victims available; • Supporting and developing programs to coordinate and collect bicycle and pedestrian count data. • Evaluate motorcycle, pedestrian and bicycle crash locations and risk factors though analysis of existing data and development of new data sources.	ODOT, Metro cities, counties, police, research institutions	Public health, advocates	Recommended
1.5	Promote and advocate for opportunities to increase large vehicle industry awareness and implement safety benefits including, but not limited to, rear wheel and side guards, sensors, front and side mirrors, and high visibility cabs. Explore opportunities to collaborate with the US DOT, ODOT, Port of Portland, City of Portland and other agencies to increase use of such safety features.	Metro, cities, counties, ODOT, Port of Portland, US DOT	Advocates, large vehicle industry	Proven
1.6	Evaluate pedestrian and bicycle crash locations and risk factors in Transportation System Plans though analysis of existing data and development of new data sources.	Cities, counties, ODOT	Metro, research institutions	Recommended
1.7	Complete the regional active transportation network, filling sidewalk gaps and bicycle gaps on the designated regional pedestrian and bicycle network including arterial roadways, by 2040.	Metro, cities and counties, ODOT, TriMet, SMART	Senior advocates, advocates, public health	Recommended

1.9	Prioritize funding for projects that: • Reduce fatal and severe injury crashes; • Increase safety for vulnerable users, including people walking, bicycling and accessing transit and schools (increasing safety for vulnerable users has been shown to increase safety for all users); and/or • Are on a high risk or injury location, with demonstrated crash history, safety concern or other risk factor; and/or • Increases safety in areas with high concentrations of people of color, people with low-incomes and people with low English proficiency.	Metro, ODOT, counties and cities	Public health, advocates	Recommended
1.10	Pursue policies and tools to reduce vehicle miles traveled, including congestion pricing, multimodal facilities, transit and Transportation Demand Management programs. Reducing vehicle miles is a key element of the Safe System approach.	ODOT, Metro, cities and counties	Advocates, public health	Recommended

4.2 Design roadways for safety

Arterial roadways have the highest serious crash rate per road mile and per vehicle mile traveled. Prioritizing and standardizing safety in street design for all modes can prevent dangerous behaviors and save lives.

This strategy is focused on designing the transportation system, especially arterial roadways, to enable and encourage safe behaviors and reduce the severity of crashes when they do occur, primarily through greater separation and slower speeds. Designing roadways to be safe for children, older adults and people walking and bicycling makes the system safe for all users.

Arterial roadways have the highest serious crash rate for all modes, and should be the primary focus of regional safety efforts. Safety interventions that match solutions to the crash pattern and street and neighborhood context are needed. Many of the region's High Injury Corridors meet or largely meet adopted design standards so simply bringing roadways up to adopted standards does not fully address the needed safety improvements, especially for people walking and bicycling.

Actions for this strategy focus on designing for safe auto speeds on arterial roadways, providing greater separation and protection between people walking, bicycling and driving, adding medians, roundabouts, access management and other design solutions to prevent crashes. The safest arterial roadways are accessed managed, include street calming, provide separation between modes, provide safe crossing for vulnerable users, and provide intuitive visual cues that make it clear that people using different modes share the space. These roadways keep all people safer – even when they make mistakes.

#	Strategy ❷ Actions	Lead	Partners	Effectiveness
2.1	Implement/prioritize context sensitive and universal design and engineering solutions such as the Federal Highway Administration proven safety countermeasures, the Highway Safety Manual and other resources that have been shown to support safe speeds, protect vulnerable users and reduce fatal and severe crashes, focusing on arterial roadways and high injury corridors and intersections. Countermeasures with proven safety benefits include: • medians and pedestrian crossing islands • protected left turn signals • separation of travel modes on streets with higher traffic speeds, volumes, and truck volumes with protected bikeways and walkways • bicycle boxes • bicycle intersection treatments • lead pedestrian intervals • pedestrian hybrid beacons • roundabouts • road diets • access management • driveway consolidation • backplates with retroreflective borders • freight aprons Pedestrian design should account for the needs of all potential users, including those with physical or mental limitations. Design and engineering solutions should account for designated truck routes to safely move freight and agricultural equipment amid other modes.	Cities, counties, ODOT, Metro	TriMet, SMART, public health, advocates	Proven and/or recommended
2.2	Develop and adopt Complete Streets policies and Complete Streets checklists.	ODOT, Metro, cities and counties	Public health, advocates	Unknown
2.3	Provide context sensitive best practices for Vision Zero street design in the Designing Livable Streets regional street design guidelines and tools.	Metro	ODOT, cities and counties, public health, advocates	Unknown
2.4	Review standards for auto travel lane widths and develop criteria to explore making 10' travel lanes preferred standard for arterial roadways in certain contexts, allowing more right-of-way for wider sidewalks, protected bikeways and other safety features.	Cities, counties, ODOT, TriMet	Metro, public health, advocates	Recommended (*greater separation of modes)*

2.5	Develop criteria and spacing standards and/or policies for enhanced pedestrian crossings in areas with pedestrian activity (such as transit access) and where enhanced crossings are greater than 530 feet apart.	Cities, counties, ODOT	Metro, public health, advocates	Recommended
2.6	Explore policies to make protected bike lanes the preferred design for arterial roadways with posted speeds of 30 mph or higher, and/or average daily traffic above 6,000 autos per day, and/or heavy truck volumes. Connections at intersections should be re-evaluated as protected bike lanes are installed.	Cities, counties, ODOT	Metro, NACTO, public health, advocates	Recommended
2.7	Illuminate the transportation system appropriately by: • Requiring new development and redevelopment in the urban area to install street and sidewalk lighting. • Integrating street and sidewalk lighting into major transportation improvement projects, where appropriate. • Exploring a variety of lighting options and identify the appropriate contexts to use them. Considering street lighting designs and practices that limit impacts on neighborhoods, wildlife and agriculture.	Cities, counties, ODOT	Metro	Recommended
2.8	Investigate and perform engineering reviews for crashes that result in fatalities and severe injuries to determine effective countermeasures for preventing future severe crashes. Conduct routine evaluation of effectiveness of traffic safety interventions.	Police, cities, counties, ODOT, academic institutions	Metro, advocates, public health	Recommended
2.9	Standardize Highway Safety Manual crash prediction project analysis to guide project development as part of the traffic analysis procedure.	ODOT, cities and counties	Metro, academic research institutions	Recommended

Figure 45: Example of a vision zero street (1)ADA accessibility, (2)public amenities, (3) protected bike lanes, (4) narrow vehicle lanes, (5) pedestrian islands, (6) wide sidewalks, (7) dedicated mass transit facilities, (8) signal protected pedestrian crossings, (9) dedicated unloading zone, (10) signal retiming
Source: Vision Zero Streets.org

4.3 Reduce speeds and speeding

Speed is a fundamental contributing factor in crash severity. Reducing speeds and preventing speeding saves lives.

The Vision Zero Network recommends recognizing and prioritizing speed as a fundamental factor in crash severity as a key principle to achieving zero deaths and severe injuries.

This strategy is focused on reducing the prevalence of speeding as well as reducing motor-vehicle speeds on arterial roadways to survivable speeds. A comprehensive approach to reducing speeds and speeding is necessary and typically involves multiple countermeasures. For example, the National Highway Traffic Safety Administration states that "no single strategy will be appropriate for all locations, and combinations of treatments may be needed to obtain speed limit compliance and achieve crash reduction goals."

The National Transportation Safety Board's landmark report and recommendations on speeding recommend a new approach to setting speeds.[52] The report describes the Safe System approach to speed limits, which differs from the traditional view that drivers choose reasonable and safe speeds. In the Safe System approach, speed limits are set according to the likely crash types, the resulting impact forces, and the human body's ability to withstand these forces. It allows for human errors (that is, accepting humans will make mistakes) and acknowledges that humans are physically vulnerable (that is, physical tolerance to impact is

[52] National Transportation Safety Board, "Reducing Speeding-Related Crashes Involving Passenger Vehicles" (July 2017)

limited). Therefore, in this approach, speed limits are set to minimize death and severe injury as a consequence of a crash.

The National Transportation Safety Board includes 19 recommendations for decreasing the prevalence of speeding related injuries, including the following:

- increasing automated enforcement
- improving speeding related data collection
- increasing the availability of intelligent speed adaptation on new vehicles
- reconsidering the 85th percentile rule of thumb
- increasing the use of the Safe System approach to design in urban areas

Actions for this strategy are focused on proven countermeasures such as designing arterial roadways that result in slower speeds, lowering posted speeds, and increasing the use of automated speed enforcement. The focus is on the arterial roadways with higher serious crash rates and Regional High Injury Corridors.

#	Strategy ❸ Actions	Lead	Partners	Effectiveness
3.1	Design arterial roadways to achieve appropriate safe target speeds, generally 35 mph or less, using design elements that have been shown to effectively result in lower speeds. A majority of excessive speed related serious crashes occur on arterial roadways.	Cities, counties, ODOT	Metro, TriMet, SMART, public health, advocates	Proven
3.2	Change state law to increase the number of jurisdictions eligible for fixed speed camera installation, especially at high injury locations. Utilize speed feedback cameras given the low cost and effectiveness and immediate information to drivers.	Cities, counties, ODOT	Metro, public health, advocates	Proven
3.3	Utilize authority provided through House Bill 2409 to issue speeding tickets through red light cameras. Change state law to increase the number of jurisdictions eligible to use this tool.	Cities, counties, ODOT, Metro	Public, health, advocates	Proven
3.4	Work with ODOT to modernize speed setting practices, including a multi-modal approach to set speed limits, incorporating factors such as land use, crash history and the presence of vulnerable road users.	Cities, counties, ODOT	ODOT, Metro, public health, advocates	Proven
3.5	Fund and install intelligent speed adaptation technologies that alert the vehicle traveling over the speed limit, prioritizing high risk and high injury corridors.	ODOT, cities, counties	Metro, public health, advocates	Proven

3.6	Utilize flexibility in setting posted speeds so that design speeds can be set at a target speed below the posted speed to increase safe operating speeds. Injury minimization or safe system approach: Speed limits are set according to the crash types that are likely to occur, the impact forces that result, and the human body's tolerance to withstand these forces.	ODOT, cities, counties	Public health, advocates, police, fire	Recommended
3.7	Change Oregon speed zone law from basic rule/limits to limits only statewide to reduce confusion and increase compliance with speed limit.	ODOT, cities, counties	Public health, advocates, police, fire	Unknown

4.4 Address distracted and aggressive driving

Aggressive or distracted driving can lead in an instant to injury or death. System design, education and policies can reduce and minimize the impact of bad decisions.

Dangerous behaviors arise from distracted or aggressive driving, including following to close, disregarding traffic signals or stop signs, failing to stop, failing to yield the right of way when turning, and excessive speeding. Aggressive driving is extremely common among U.S. drivers. A recent study by the AAA Foundation for Traffic Safety found that nearly eighty percent of drivers expressed significant anger, aggression or road rage behind the wheel at least once in the previous year. Distracted driving, especially the use of smart phones while driving is difficult to track though it is generally agreed that instances of 'texting while driving" are increasing.

This strategy is focused on reducing and minimizing the impact of dangerous behaviors. Dangerous behaviors often arise from larger social issues and norms that are difficult to address within the context of transportation alone. Seeking opportunities to partner and collaborate with partners working on these larger social issues and norms, including public health, schools and community and non-profit groups is important to address the root causes of aggressive and distracted driving.

Actions for this strategy focus on changing overall systems and using education and technology to reduce the prevalence of dangerous behaviors in the first place. Targeted high-visibility enforcement is included with an emphasis on taking actions to reduce the disproportionate impacts on and over policing of people of color and people with low incomes. Action 4.6 is a catch-all action to get at the larger social issues and norms that can lead to aggressive and distracted driving.

#	Strategy ❹ Actions	Lead	Partners	Effectiveness
4.1	Focus high visibility enforcements on dangerous behaviors (speeding, failing to yield to pedestrians, signal violations, improper turns/illegal turns, texting while driving) and high injury corridors, taking actions to reduce the disproportionate impacts on people of color and people with low incomes, including fully implementing Oregon's anti-racial profiling bill (House Bill 2355). Research shows that high-visibility enforcement can reduce drunk driving fatalities by as much as 20%.	Police, cities, counties	Metro, ODOT, advocacy groups, public health	Recommended
4.2	Increase penalties for dangerous behaviors, identifying actions to reduce the disproportionate impacts from fines on people of color and people with low incomes, such as diversion classes and other non-monetary penalty options.	State, cities, counties, police	Metro, ODOT, advocacy groups, public health	Recommended
4.3	Support implementation of recommendations identified in Reducing Distracted Driving in Oregon report and House Bill 2597 "Distracted Driving Law."	ODOT, police, cities and counties, Metro	Public health, advocates, auto industry	Unknown
4.4	Support auto insurance companies to provide lower auto insurance costs to drivers that install technologies to turn off phone while driving.	ODOT, Metro, cities, counties, advocates	Public health, advocates	Unknown
4.5	Compile a comprehensive list and contacts of private sector companies that operate large numbers of vehicles in the region, and identify a process that supports state and local partners to engage in outreach regarding safe driving behaviors to members, workforces and customers – companies such as ride hailing services and trucking companies.	Metro, ODOT, cities and counties	ODOT, cities and counties, commercial vehicle companies	Unknown
4.6	Support legislation to increase frequency of driver education, testing, inclusion of urban transportation safety in test materials, and driver's license renewal.	Metro, ODOT, cities and counties	Advocates, public health	Recommended

4.5 Address impairment

Crashes involving alcohol and drugs have a much higher likelihood of being fatal than other crashes. Providing options to people using the roadways while drunk or intoxicated saves lives.

This strategy is focused on upstream solutions to reduce the prevalence of people using the roadways while impaired. Intoxication arises from larger social issues and norms that are difficult to address within the context of transportation alone. Seeking opportunities to partner and collaborate with partners working on these larger social issues and norms, including public health, schools and community and non-profit groups is important to address the root causes of aggressive and distracted driving.

Actions for this strategy focus on changing overall systems and using education and technology to prevent impaired driving from occurring. Targeted high-visibility enforcement is included with an emphasis on taking actions to reduce the disproportionate impacts on people of color and people with low incomes.

#	Strategy 5 Actions	Lead	Partners	Effectiveness
5.1	Identify funding to send law enforcement to Drug Recognition Experts (DRE) training, and training to prevent profiling.	Police, cities, counties	State, public health, advocates	Recommended
5.2	Adopt National Transportation Safety Board recommendation to reduce Blood Alcohol Concentration limit to 0.05.	State	Advocates, public health, Metro, cities and counties	Proven
5. 3	Implement pre-paid morning parking programs in areas where appropriate (prevents towing/ticket for drivers who choose other way home).	Cities, counties	Public health, advocates	Recommended
5.4	Promote use of apps such as SaferRide developed by NHSTA, which provide people easy ways to find a safe ride home.	Cities, counties, ODOT, Metro	Public health, advocates	Recommended
5.5	Explore opportunities to support the U.S. DOT to work with industry groups and vehicle manufacturers to further the use of technology to reduce impaired driving.	ODOT, Metro, cities and counties	Public health, advocates	Recommended
5.6	Support culturally appropriate safety programs and educational messages, paired with outreach and investments, to curb the risk of impaired driving, using resources such as NHSTA's Impaired Driving Segmentation research (2017). Messaging is more effective when there	ODOT, Metro, cities and counties, advocates,	Public health, advocates	Recommended

	is an in-depth understanding of what messages work for different groups, and when paired with other investments. Coordinate with public health initiatives and partners.	public health		

4.6 Ongoing engagement and coordination

Many partners will implement Vision Zero. Ongoing engagement and coordination among all partners is essential.

One of the most challenging elements of a Safe System approach is bringing together all of the people and organizations that contribute to the safety of the transportation system. For this reason, coordination and leadership are critical to success.

This strategy focuses on the need to increase and maintain coordination and engagement among partners. As the region's Metropolitan Planning Organization, Metro plays an important role in convening and facilitating regional discussions and efforts to ensure partnerships are successful in achieving the regional vision.

Actions for this strategy focus on convening partners, setting work programs, tracking progress, maintaining and improving data, introducing and supporting legislation and updating regulations and policies.

#	Strategy 6 Actions	Lead	Partners	Effectiveness
6.1	Develop Metro work program to implement actions where Metro is a lead or one of several leads. Include work program elements to support implementing actions where Metro is not the lead.	Metro	Cities, counties, ODOT, public health, advocates, police, fire, TriMet, SMART	Recommended
6.2	Convene, as needed, transportation safety meetings with local and state partners to implement 2018 RTSS. Determine frequency of meetings in work program developed in Action 6.1. Identify police and fire representatives to participate in regional coordination meetings.	Metro	Cities, counties, ODOT, FHWA, public health, advocates, police, fire, TriMet, SMART	Recommended
6.3	Provide an annual Vision Zero report back to Joint Policy Advisory Committee on Transportation (JPACT) and Metro Council, reporting on MAP-21 safety targets and regional safety plan implementation.	Metro	Cities and counties, ODOT, TriMet, SMART, public health, advocates	Recommended

6.4	Review the strategies and actions of the Safety Strategy prior to each update of the Regional Transportation Plan and update as needed.	Metro	Cities and counties, ODOT, TriMet, SMART, public health, advocates	Recommended
6.5	Maintain and update Metro crash data. • Update Metro webpage annually with MAP-21 transportation safety performance measure data; include data on race and ethnicity as available. • Update and maintain regional crash map tool and crash map. • Develop a regional crash prediction modeling tool that utilizes and links social and environmental factors with injury data.	Metro	FHWA, ODOT, public health, academic inst.	Recommended /Proven
6.6	Identify opportunities to engage and partner with community based organizations and advocates, especially to increase opportunities for proactive monitoring and feedback gathering from the community on their safety issues and concerns. Conduct targeted outreach/education to communities near high injury arterials and intersections, focusing on historically marginalized communities.	Metro, ODOT, cities and counties	Public health, advocates	Recommended
6.7	Support development of city and county Transportation Safety Action Plans and Vision Zero targets; include a transportation safety plan, with data analysis that addresses all modes and is based on a safety inventory based on both an analysis of crash rates and an analysis of crash risks in the updates of Transportation System Plans; participate in local, regional and state safety task forces, and develop and participate in state, regional and city safety summits.	Metro, ODOT, DLCD, cities and counties	Public health, advocates, TriMet, SMART	Recommended
6.8	Identify opportunities to develop safety workshops for state, regional, county and city staff on Vision Zero framework and priorities, including racial equity and public health.	Metro, ODOT, TriMet, cities and counties	FHWA	Recommended
6.9	Convene regular local safety meetings made up of state and local transportation and public health professionals, equity representatives, police and fire, and community and advocacy organizations, to review progress on implementing safety plans and collaborate on specific topics, such as impairment, distracted driving, street design, and enforcement.	Local agencies	ODOT, Metro, public health, advocates, police, fire, TriMet, SMART	Recommended

	Integrate Vision Zero/Toward Zero Deaths framework and priorities, including racial equity and public health.			
6.10	Identify funding for and develop at least one annual coordinated culturally appropriate and targeted mass media safety campaign in the region, utilizing campaign materials developed by NHSTA, Drive Toward Zero, Vision Zero, Toward Zero Deaths and other sources as appropriate. Strong, targeted advertising with high-visibility enforcement and publicity about that enforcement have proven to be most effective.	Metro, cities, counties, ODOT	Advocates, public health	Proven
6.11	Support safety legislation, regulations and funding at the state and federal level that implement Vision Zero and do not increase racial disparities.	Metro, ODOT, cities, counties, advocates	Advocates, public health	Recommended
6.12	Monitor federal and state autonomous vehicle policies and ensure that they do not place the burden of safety on vulnerable users (such as requiring them to carry a sensor or install a phone application to be picked up by an autonomous vehicle), and require rigorous safety testing of all autonomous vehicles prior to public deployment.	Metro, ODOT, cities and counties	Advocates, public health, AV industry	Unknown
6.13	Update the Regional Transportation Functional Plan to require Transportation System Plans to include a transportation safety plan, with data analysis that addresses all modes and is based on a safety inventory based on both an analysis of crash rates and an analysis of crash risks, to require that Transportation System Plans identify safety as a need, and to require that transportation projects do not make a known safety problem worse, and to be consistent with the Regional Safety Strategy.	Metro	Cities, counties, ODOT, TriMet, advocates, public health	Unknown
6.14	Update the following sections of OAR 660-012-0000, the Oregon Transportation Planning Rule: • Section 0020 (2), requiring Transportation System Plans to include a transportation safety plan, with data analysis that addresses all modes and is based on a safety inventory based on both an analysis of crash rates and an analysis of crash risks. • Section 0030 (1) and (2) identifying safety as a need. • Section 0060 (1)(c) clarifying that making a known safety problem worse constitutes a	DLCD, Metro, ODOT	Cities and counties, advocates	Recommended

	"significant effect".			
6.15	Best practices recommend that police periodically review, update and conduct trainings to reflect new traffic safety priorities.	Police, state, cities, counties,	Advocates, public health	Recommended

CHAPTER 5 IMPLEMENTATION

In the Safe System approach coordination across all areas of government and partners is necessary to fully implement strategies and actions. Engagement and coordination actions are outlined in Strategy 6. Implementation is always contingent on the availability of funding and the political will to take steps which may be politically challenging. Prioritization of safety in transportation funding and projects, prioritization of vulnerable users – especially people walking - slowing speeds, education and ongoing coordination are all needed for the region to work towards Vision Zero.

There are **many efforts underway** in the greater Portland region that are increasing safety and reducing crashes. These efforts will need to be **sustained and increased** to keep pace with an increase in vehicle miles traveled and a growing economy – both which could result to more Serious crashes if plans are not implemented. Efforts underway that impact safety include:

- Implementing of adopted land use plans
- Developing and implementing county and city transportation safety action plans
- Filling sidewalk gaps and adding enhanced pedestrian crossings
- Adding protected bikeways and protected intersections
- Increasing awareness of Vision Zero and role of speed in serious crashes
- Investigating fatal and serious injury crash sites
- Collecting data on race and ethnicity in traffic stops
- Improving coordination among partners
- Increasing use of speed cameras to reduce speeding
- Increasing Safe Routes to School programs and infrastructure
- Increasing public access to safety data and ability to report safety issues
- Increasing focus on preventative actions on high risk roads
- Supporting better technology in motor-vehicles to increase safety
- Continuing widespread seat belt use
- Increasing police training to identify drug and alcohol use
- Increasing access to ride options such as Uber and Lyft to reduce impaired driving [53]
- Creating innovative public awareness campaigns

[53] "Does Uber Really Prevent Drunk Driving? It Depends on the Study" New York Times, April 7, 2017. – initial research suggests that the increase in availability of ride-hailing services such as Lyft and Uber could help lower the incidents of drunk driving, supporting the overall approach of providing travel options and other programs to support not driving drunk.

5.1 Metro work program

Metro will develop a work program (Safety Strategy Action 6.1) describing tasks and a timeline to take direct action or support partners in implementing the Regional Safety Strategy. Steps to implement actions where Metro is the lead or co-lead will be identified.

Metro's work program will focus on actions to be taken in the next five years following adoption of the 2018 Regional Transportation Plan.

An annual progress report will be given to the Metro Council, JPACT and MPAC (Safety Strategy Action 6.3). The progress report will include progress made towards meeting federally required transportation safety targets and progress on actions by Metro and partners.

5.2 Engagement and coordination

Ongoing engagement and coordination among all partners is essential to reach regional federally required safety targets and move towards Vision Zero.

Chapter 4 identifies recommended strategies and actions for reducing fatalities and life-changing injuries in the greater Portland region. Using a data-driven approach, the strategies and actions were identified as the most effective ways to address the most frequent contributing factors and types of serious crashes in the region, and they are consistent with the Safe System approach. As indicated in the Strategies and Actions Table, most actions require multiple partners for implementation.

Transportation safety and achieving zero deaths and serious injuries is everybody's business. Government alone cannot achieve the broader changes needed to reach Vision Zero. In addition to national, state, regional and local agencies, multiple organizations, private entities and the public play a role in achieving Vision Zero. Engineers, emergency medical service providers, law enforcement, educators, public health professionals, community based organizations and non-profits, the media, industry and business, research and academic institutions, and users of the transportation system all have a role.

Safety Strategy Actions 6.2 and 6.9 recommend convening safety work groups at the regional and local level, or continuing to support those that are already meeting. Complementing state safety committees and work groups, regular regional and local safety work groups will support state, regional and local coordination.

As noted in Safety Strategy Action 6.2, police and fire representatives need to be involved at the regional level; their perspective has not been fully integrated at the regional level of planning.

5.3 Implementing and updating plans

Implementing adopted land use and transportation system plans, including the 2040 Growth Concept, will help achieve Vision Zero. Building walkable and bikeable communities, reducing travel distances, locating jobs and housing near each other, making transit more accessible all contribute to safer communities.

As described in Chapter 3, the Portland region has one of the lowest roadway fatality rates of any urban metro area with a population greater than 1 million, and a lower fatality rate than Oregon and the U.S. The safest regions in the nation for overall fatality rates are Boston, Minneapolis-St. Paul, Portland, New York, and Chicago. In general, the safest urban regions are those that exhibit dense urban environments and higher usage of non-auto travel modes. These findings indicate that regional and local land use and transportation plans, policies and investments are increasing transportation safety.

The Regional Transportation Plan is updated every five years. As part of the update safety policies, strategies and actions should be reviewed. Crash data analysis in the Metro State of Safety Report should be updated to reflect five years of crash data.

Local Transportation System Plans are updated every four years to be consistent with the Regional Transportation Plan. Safety Strategy Actions 6.13 and 6.14 recommends updating the Transportation Planning Rule and the Regional Transportation Functional Plan to require that safety plans be included in Transportation System Plans.

5.4 Regional Transportation Plan safety projects and programs

This section to be updated after the 2018 Regional Transportation Plan project list is refined and finalized by state and local partners.

The 2018 Regional Transportation Plan includes a list of projects and programs that should address the highest public priorities and most immediate regional transportation challenges. The project list identifies the projects that are planned to be built in the next 25 years. Safety is a priority in Regional High Injury Corridors and Intersections and in race and income marginalized communities.

Each time the Regional Transportation Plan is updated it provides opportunity to identify safety focused projects that will reduce serious crashes. Identifying safety projects in the Regional Transportation Plan helps regional leaders and the public better understand how, when and where safety problems are being addressed. It also provides an understanding of how much investment is being planned for safety projects. All projects located in a Regional High Injury Corridor should identify safety as a primary purpose or secondary objective in the Regional Transportation Plan.

Definition of a safety project

In the Regional Transportation Plan, safety projects are identified as projects that have the primary purpose of addressing a documented safety problem at a documented high injury or high risk location with one or more proven safety counter measures.

The definition of a safety project was developed to be consistent with Highway Safety Improvement Program criteria.

A critical element of the Regional Safety Strategy is completing projects that make the transportation system safer and more secure, especially in high risk and High Injury Corridors and Intersections and in racial and income marginalized communities.

The 2018 Regional Transportation Plan project list has over 1,000 projects planned for cities and counties in the region. Of those projects:

- Three-hundred eighty two of the projects identify reducing crashes or serious crashes as a primary or secondary objective.
- Fifty-three identify reducing crashes or serious crashes as a primary objective.
- One third of the projects directly address safety and identify reducing crashes or serious crashes as a primary or secondary objective. A majority of these projects are on High Injury Corridors and/or in race and income marginalized communities.
- A majority of all projects in the list are on high injury corridors, representing an opportunity to address safety even if the project is not identified as a safety project.
- Safe Routes to School, Transit Oriented Development and Transportation System Management and Operations programs address safety.

[insert graphic showing project breakdown]

[insert map showing safety projects overlayed with High Injury Corridors]

CHAPTER 6 MEASURING PROGRESS

Progress towards Vision Zero will be measured by the number of fatal and severe injury crashes reduced annually.

In addition to tracking observed crashes, Metro will work to develop tools such as crash prediction models that will allow for and support system evaluation measures for future scenarios and planning. Metro will work with regional partners, the Oregon Department of Transportation and the Federal Highway Administration to develop ways to measure safety performance in the future to support decision making.

6.1 Annual safety targets

State Departments of Transportation and Metropolitan Planning Organizations must report on the federally required safety performance measure identified in MAP-21 and the FAST Act. Metro will report on these measures in each update of the Regional Transportation Plan, and in the Metropolitan Service District report of performance measures that Metro is required to submit in accordance with ORS 197.301 to the Department of Land Conservation and Development (DLCD) every two years. Additionally, Metro will report out annually to the Metro Council and the Joint Policy Advisory Committee on Transportation (JPACT).

To satisfy federal requirements, Metro will report on the five-year rolling average of the number of people killed and seriously injured in traffic crashes in the region, per 100 million miles traveled (per VMT) and the number of non-motorized fatalities and serious injuries, as shown in Figure X. Metro is also tracking the fatal and serious injuries per capita.

	FHWA Performance Measures						
		Fatality Rate			Serious Injury Rate		
Reporting Year (based on a 5-year rolling average)	Fatalities (People)	Per VMT (People/ 100 MVMT)	Per capita (People/ 100k pop)	Serious Injuries (People)	Per VMT (People/ 100 MVMT)	Per capita (People/ 100k pop)	Non-Motorized Fatalities and Serious Injuries (People)
2011 - 2015 (Base)	62	0.9	4.0	457	6.4	29.4	113
2014 - 2018	58	0.8	3.6	425	5.8	26.5	105
2015 - 2019	55	0.7	3.4	407	5.5	25.1	101
2016 - 2020	52	0.7	3.2	384	5.1	23.4	95
2017 - 2021	49	0.6	2.9	357	4.7	21.5	88
Note: Due to rounding, addition of numbers across modes may result in minor variation from totals.							

Figure 46: Metro MPO Safety Performance Targets

Metro set the annual targets using the same methodology as the Oregon Department of Transportation in the 2016 Transportation Safety Action Plan. Targets are set using the "S-curve" as shown in Figures x and x.

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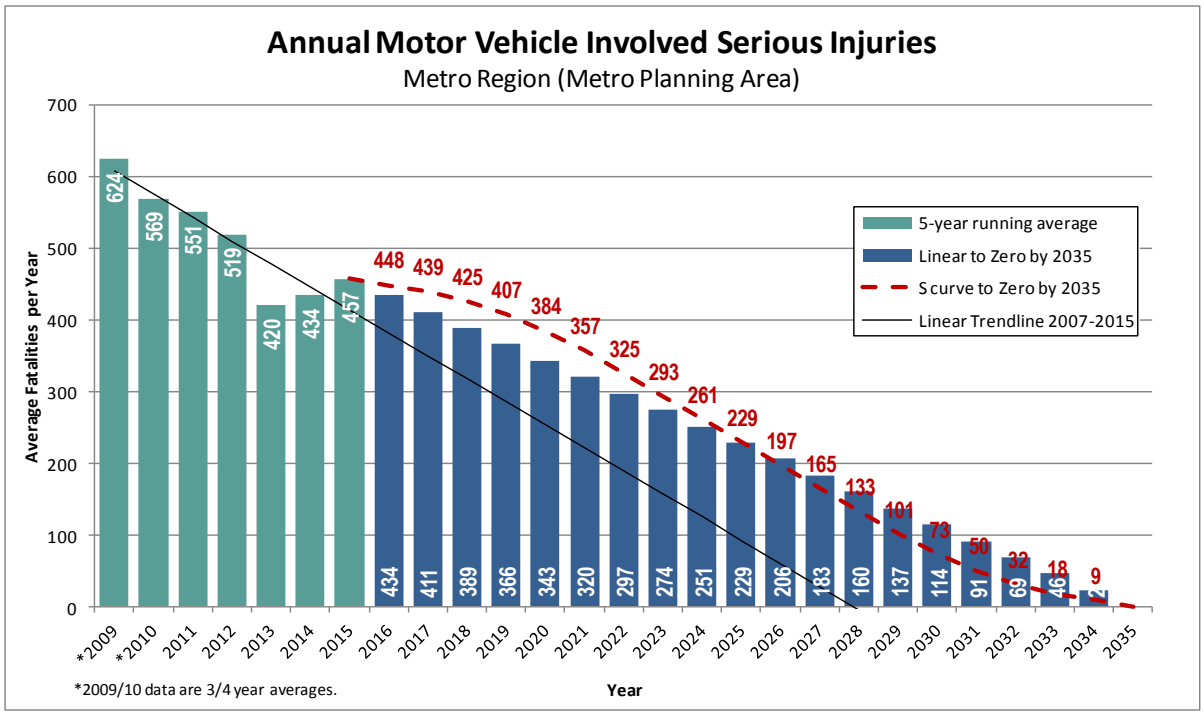

Figure 47: Annual Motor Vehicle Involved Serious Injuries

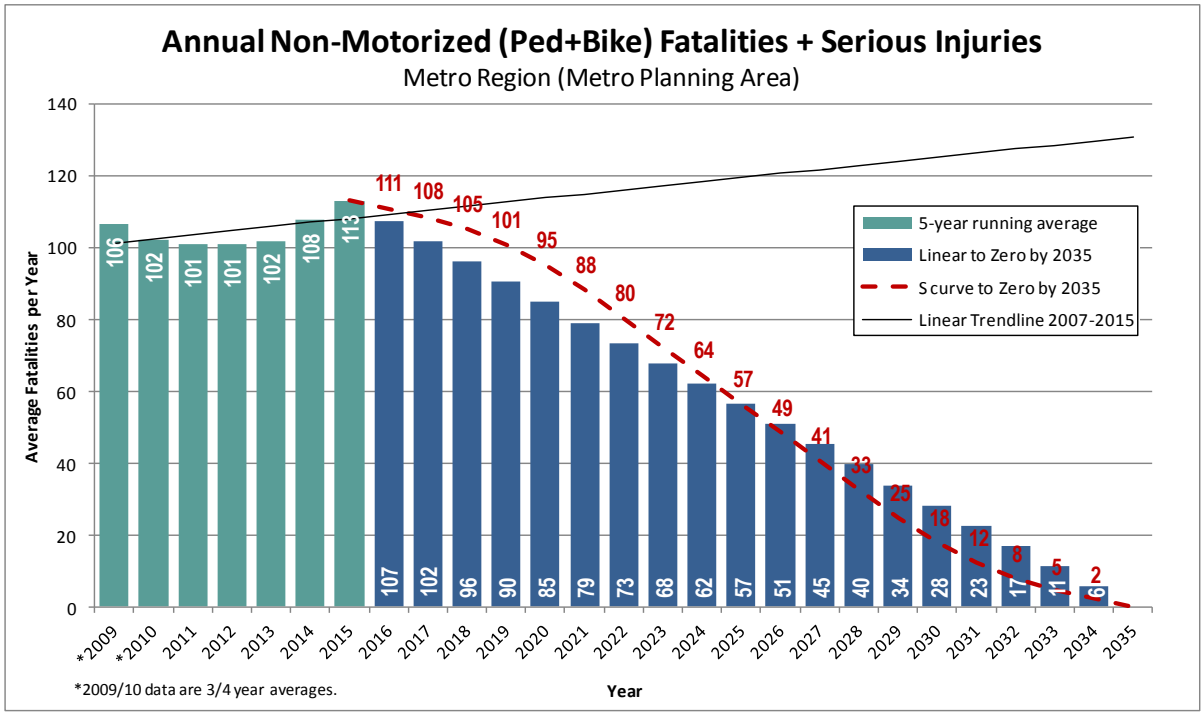

Figure 48: Annual Non-Motorized Fatalities and Serious Injuries

In addition to the required federal targets, Metro also set targets for the number of fatalities and serious injuries for each mode separately, as well as per VMT and per capita for each mode, as shown in Figures X-X.

	Motor Vehicle Only					
		Fatality Rate			Serious Injury Rate	
Reporting Year (based on a 5-year rolling average)	Fatalities (People)	Per VMT (People/ 100 MVMT)	Per capita (People/ 100k pop)	Serious Injuries (People)	Per VMT (People/ 100 MVMT)	Per capita (People/ 100k pop)
2011 - 2015 (Base)	38	0.5	2.4	368	5.2	23.7
2014 - 2018	35	0.5	2.2	343	4.7	21.3
2015 - 2019	34	0.5	2.1	328	4.4	20.2
2016 - 2020	32	0.4	1.9	309	4.1	18.8
2017 - 2021	30	0.4	1.8	287	3.8	17.3
Note: Due to rounding, addition of numbers across modes may result in minor variation from totals.						

Figure 49: Metro MPO Motor Vehicle Fatal and Serious Injury Safety Targets

	Pedestrians					
		Fatality Rate			Serious Injury Rate	
Reporting Year (based on a 5-year rolling average)	Fatalities (People)	Per VMT (People/ 100 MVMT)	Per capita (People/ 100k pop)	Serious Injuries (People)	Per VMT (People/ 100 MVMT)	Per capita (People/ 100k pop)
2011 - 2015 (Base)	22	0.3	1.4	56	0.8	3.6
2014 - 2018	20	0.3	1.3	52	0.7	3.2
2015 - 2019	20	0.3	1.2	49	0.7	3.0
2016 - 2020	18	0.2	1.1	47	0.6	2.8
2017 - 2021	17	0.2	1.0	43	0.6	2.6
Note: Due to rounding, addition of numbers across modes may result in minor variation from totals.						

Figure 50: Metro MPO Pedestrian Fatal and Serious Injury Safety Targets

	Bicyclists					
		Fatality Rate			Serious Injury Rate	
Reporting Year (based on a 5-year rolling average)	Fatalities (People)	Per VMT (People/ 100 MVMT)	Per capita (People/ 100k pop)	Serious Injuries (People)	Per VMT (People/ 100 MVMT)	Per capita (People/ 100k pop)
2011 - 2015 (Base)	2.2	0.03	0.14	33	0.5	2.1
2014 - 2018	2.0	0.03	0.13	31	0.4	1.9
2015 - 2019	2.0	0.03	0.12	30	0.4	1.8
2016 - 2020	1.8	0.02	0.11	28	0.4	1.7
2017 - 2021	1.7	0.02	0.10	26	0.3	1.6
Note: Due to rounding, addition of numbers across modes may result in minor variation from totals.						

Figure 51: Metro MPO Bicycle Fatal and Serious Injury Safety Targets

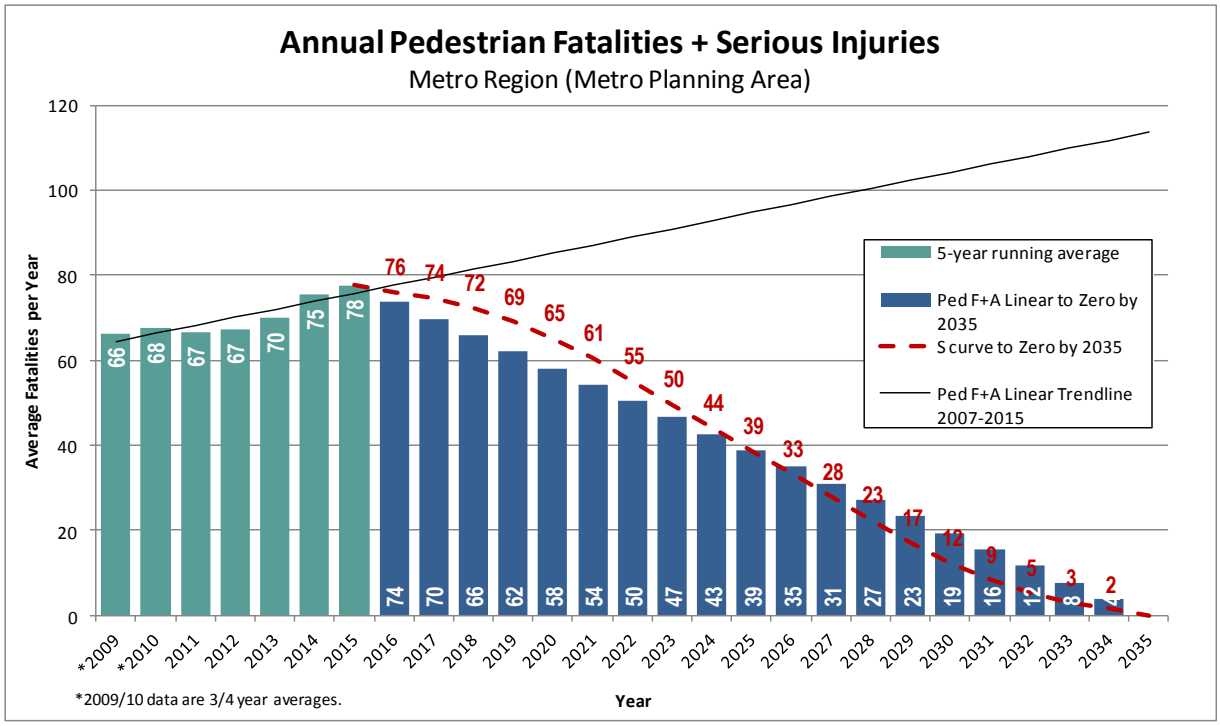

Figure 52: Annual Pedestrian Fatalities and Serious Injuries

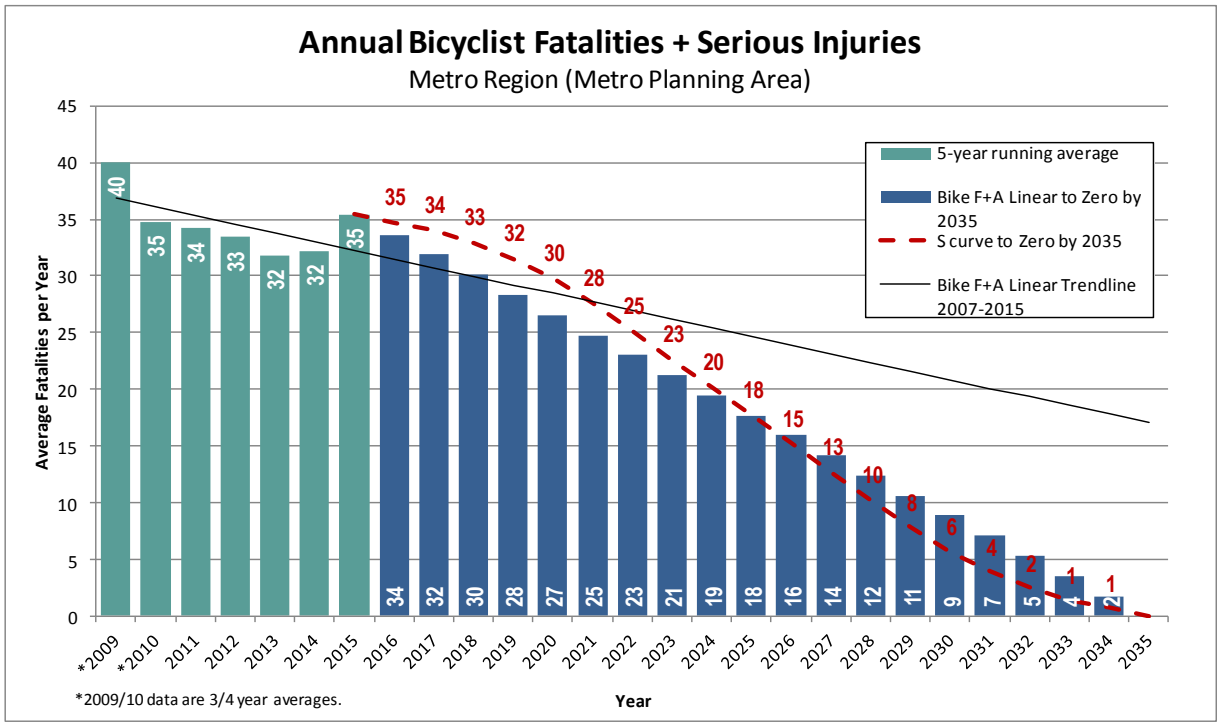

Figure 53: Annual Bicycle Fatalities and Serious Injuries

ACRONYMS

AASHTO	American Association of State Highway and Transportation Officials
DLCD	Department of Land Conservation and Development
FAST ACT	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HSM	Highway Safety Manual
HIC	High Injury Corridor
HSIP	Highway Safety Improvement Plan
JPACT	Joint Policy Advisory Committee on Transportation
MAP-21	Moving Ahead for Progress in the 21st Century Act
MMLOS	Multi Modal Level of Service
MPA	Metro Planning Area
MPAC	Metro Policy Advisory Committee
MTAC	Metro Technical Advisory Committee
NHSTA	National Highway Safety Traffic Administration
RATP	Regional Active Transportation Plan
RTFP	Regional Transportation Functional Plan
RTP	Regional Transportation Plan
	Regional Transportation Safety Strategy (Safety Strategy)
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
ODOT	Oregon Department of Transportation
OTP	Oregon Transportation Plan
UGMFP	Urban Growth Management Functional Plan
SHSP	State Highway Safety Plan
TPAC	Transportation Policy Alternatives Committee
TSAP	Transportation Safety Action Plan
TSP	Transportation System Plan
VMT	Vehicle Miles Traveled

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LIST OF PARTNERS

Government alone cannot achieve the broader changes needed to end traffic fatalities. In addition to national, state, regional and local agencies, multiple organizations, private entities and the public play a role in achieving Vision Zero.

National agencies
U.S. Department of Transportation
Federal Highway Administration
National Highway Traffic Safety Administration
Centers for Disease Control

State agencies
Oregon Department of Transportation
Oregon Health Authority
Department of Motor Vehicles
Oregon State Police
Department of Land Conservation and Development
Oregon Liquor Control Commission

Regional Agencies and Districts
Metro
TriMet
SMART
Port of Portland

City and County transportation and land use agencies
Transportation and land use departments/staff for the three counties and twenty-five cities
County public health agencies
Clackamas County Public Health
Multnomah County Public Health
Washington County Public Health

Schools
Public and private, K-college

Elected officials
U.S. Representatives and Senators
State Representatives and Senators
Governor
Metro Council
Metro Joint Policy Advisory Committee on Transportation
City Mayors and Councils
County Commissioners

Appointed committees
Oregon Transportation Commission
Oregon Transportation Safety Committee

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Oregon Bicycle and Pedestrian Advisory Committee
Oregon Freight Advisory Committee
Oregon Transit Advisory Committee
Portland pedestrian, bicycle and freight committees
City and county transportation committees

Emergency Service Providers and County and Local Police
Clackamas, Multnomah and Washington County Sheriff's Offices
City Police

County and City Fire & Rescue
Portland Fire and Rescue
Tualatin Valley Fire and Rescue
Clackamas Fire District #1
Multnomah County Fire District #14
Washington County Fires District #2
Gresham Fire
Hillsboro Fire
Cornelius Fire
Forest Grove Fire and Rescue
Gladstone Fire
Lake Oswego Fire

Advocacy and Community Organizations
Oregon Walks
Oregon and SW Washington Families for Safer Streets
Vision Zero Network
Toward Zero Deaths
Safe Routes to School National Partnership
AARP
Street Trust
Community Cycling Center

Commercial Vehicle Companies
Companies located and/or operating in the region

Industry Groups
Auto insurance companies
Auto manufacturers
AAA

Research and Academic Institutions
Portland State University
ODOT Research
Transportation Research Board (TRB)
Volpe Institute

RESOURCES

State and Local Transportation Safety Action Plans

- Beaverton Transportation Safety Action Plan (2017)
- Portland Vision Zero Action Plan (2016)
- Oregon Transportation Safety Action Plan (2016)
- Oregon Department of Transportation Pedestrian and Bicycle Safety Implementation Plan (2014)
- Hillsboro Transportation Safety Action Plan (2017)
- Washington County Transportation Safety Action Plan (2017 draft)
- Clackamas County Transportation Safety Action Plan (2013)

Vision Zero, Road to Zero and Toward Zero Deaths Resources

- *Sustainable and Safe: A Vision and Guidance for Zero Road Deaths*, World Resources Institute, Global Road Safety Facility (2017)
- *Moving from Vision to Action: Fundamental Principles, Policies and Practices to Advance*, Vision Zero Network
- *Vision Zero in the U.S.* (February 2017) http://visionzeronetwork.org/wp-content/uploads/2017/01/MinimumElements_Final.pdf
- 9 Components of a Strong Vision Zero Commitment; Vision Zero Network (2015)
- Toward Zero Deaths: A National Strategy on Highway Safety (2014)
- *Safer People, Safer Streets: Summary of the U.S. Department of Transportation Action Plan to Increase Walking and Biking and Reduce Pedestrian and Bicyclist Fatalities* (September 2014) https://www.transportation.gov/sites/dot.gov/files/docs/safer_people_safer_streets_summary_doc_acc_v1-11-9.pdf

Race and Ethnicity Safety Research

- *The High Costs of Disparities for People of Color in Multnomah County*, Lee Van Der Voo & Nick Budnick. (2017). http://invw.org/2017/02/02/being-black-in-multnomah-county/
- *Racial Bias in Drivers' Yielding Behavior at Crosswalks: Understanding the Effect.* Kimberly Kahn, Portland State University
- *Dangerous by Design*, National Complete Streets Coalition (2016)

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- *Vision Zero, Equity& Law Enforcement*, Leah Shahum (2016) http://visionzeronetwork.org/vision-zero-equity-law-enforcement/
- *Motor Vehicle Traffic-Related Pedestrian Deaths — United States, 2001–2010,"* Centers for Disease Control (2013)
- *Income Disparities in Street features that Encourage Walking,* Bridging the Gap (2012) http://www.bridgingthegapresearch.org/_asset/02fpi3/btg_street_walkability_FINAL_03-09-12.pdf
- *Pedestrians Dying at Disproportionate Rates in America's Poorer Neighborhoods,* Governing, (August 2014) http://www.governing.com/topics/public-justice-safety/gov-pedestrian-deaths-analysis.html
- *Racial/Ethnic Differences in Fatality Rates from Motor Vehicle Crashes: An Analysis from a Behavioral and Cultural Perspective*, Huda Hamdan (2013) http://scholarscompass.vcu.edu/cgi/viewcontent.cgi?article=3983&context=etd
- *Alcohol and Highway Safety: A Special Report on Race/Ethnicity and Impaired Driving,* U.S Department of Transportation (2010) https://ntl.bts.gov/lib/61000/61600/61640/tt398.pdf
- NHSTA Traffic Safety Facts, Race and Ethnicity Equity (2006) https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/810995

Data and Research Resources

- *Safety Study: Reducing Speeding-Related Crashes Involving Passenger Vehicles*, National Transportation Safety Board (2017)
- *Safety for All Users Report: A Report Developed by the U.S. Department of Transportation Under Section 1442 of the Fixing America's Surface Transportation (FAST) Act* (December 2017).
- *A Right to the Road: Understanding and Addressing Bicyclist Safety*, Governors Highway Safety Association (2017)
- *Everyone Walks: Understanding and Addressing Pedestrian Safety,* Governors Highway Safety Association (2017)
- *A Vision for Transportation Safety: Framework for Indentifying Best Practice Strategies to Advance Vision Zero.* Arielle Fleisher, Megan Wier, and Mari Hunter. Transportation Research Record: Journal of the Transportation Research Board, No. 2582. (2016)
- *Countermeasures That Work: A Highway Safety Countermeasure Guide for State Highway Safety Offices*, Eighth Edition. DOT HS 812 202. Washington, DC: US Department of Transportation, NHTSA (2015)

- National Highway Traffic Safety Administration, State Traffic Safety Information https://cdan.nhtsa.gov/STSI.htm#
- Crash Modification Factors Clearinghouse http://www.cmfclearinghouse.org/
- Oregon Health Authority, Injury in Oregon: data report (2014) http://www.oregon.gov/oha/PH/DISEASESCONDITIONS/INJURYFATALITYDATA/Documents/Injury_in_Oregon_v2.3.pdf
- Traffic Safety Facts, 2015 Motor Vehicle Crashes: Overview, National Highway Traffic Safety Administration (2015) https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812318
- National Highway Traffic Safety Administration, Impaired Driving Segmentation Research (2017)
- Speed Enforcement Camera Systems Operational Guidelines, FHWA & NHTSA (2008)
- *Reducing Distracted Driving in Oregon: An Interdisciplinary Approach to a Statewide Problem*, Oregon Department of Transportation Distracted Driving Task Force. (2017)
- Southern Oregon University. *Distracted Driving: An Epidemic, A Study of Distracted Driving Attitudes, Behaviors and Barriers Preventing Change* (2016). www.oregon.gov/ODOT/Documents/Distracted Driving
- *Zendrive Research: Largest Distracted Driving Behavior Study.* (April 2017) http://blog.zendrive.com/distracted-driving/
- *Summary of Oregon Truck Safety and Guide to the 2017 Commercial Vehicle Safety Plan* (2017)

GLOSSARY

[Definitions are still being finalized]

Aggressive Driving One or more of driving too fast for conditions, following too closely, and/or driving in excess of posted speed was an attribute of the crash.

American Association of State Highway and Transportation Officials (AASHTO) Represents all five transportation modes: air, highways, public transportation, rail, and water and has a primary goal of fostering the development, operation, and maintenance of an integrated national transportation system.

Arterial Street A functional classification for surface streets. AASHTO defines arterials from the motor vehicle perspective as providing a high degree of mobility for the longer trip lengths and high volumes of traffic, ideally providing a high operating speed and level of service and avoiding penetrating identifiable neighborhoods.

Autonomous Vehicle (AV) Also known as a driverless car, self-driving car, robotic car is and unpiloted ground vehicle is that is capable of sensing its environment and navigating without human input.

Basic Rule Speed A speed that is reasonable and prudent considering the conditions at the time. Speeds in excess of the posted speed are evidence of the violation. Basic rule violations can apply on any roadway.

Best Practices For purposes of this document, the term "best practices" is used as a general term of preferred practices accepted and supported by experience of the applicable professional discipline. It is not prescriptive to a particular set of standards or a particular discipline.

Collector A functional classification for surface streets. AASHTO defines collectors as providing both land access and traffic circulation within neighborhoods and commercial and industrial areas. The role of the collector system, from the motor vehicle perspective, is to distribute traffic to and from the arterial system.

Complete Streets A transportation policy and design approach that requires streets to be planned, designed, operated, and maintained to enable safe, convenient and comfortable travel and access for users of all ages and abilities regardless of their mode of transportation.

Context Sensitive Design A model for transportation project development that requires proposed transportation projects to be planned not only for its physical aspects as a facility serving specific transportation objectives, but also for its effects on the aesthetic, social, economic and environmental values, needs, constraints and opportunities in a larger community setting. Projects designed using this model:

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Countermeasure An activity, initiative or design element to prevent, neutralize, or correct a specific safety problem.

Crash A violent collision, typically of one vehicle with another (vehicles include bicyclists, motorcyclists, freight trucks, school buses, transit buses, etc), a pedestrian, or with a stationary objects such as a pole or guard rail.

Crash Reduction Factor (CRF) The percentage crashes reduced that might be expected after implementing a given countermeasure at a specific site. For example, the installation of centerline rumble strips on a two-lane roadway can expect a fourteen percent reduction in all crashes and a fifty-five percent reduction in head-on crashes.

Design Speed Speed for which roadway elements such as curves are designed.

Designated Speed As opposed to statutory speeds (e.g., 35 mph on city arterial), and must be established by a defined speed zoning process and investigation. Designated speeds are approved by the Oregon Department of Transportation.

Distracted Driving Engagement in any activity that could divert a person's attention away from the primary task of driving. Typical distractions include eating, dealing with passengers or pets, changing settings on vehicle devices, and, increasingly, using a cellular phone or other electronic device.

Emerging Technologies Are the technical innovations representing progressive developments within a field aim at providing competitive advantage.

Emergency Medical Services (EMS)

Equity See Racial Equity and Social Equtiy

Fatal Analysis Reporting System (FARS) A nationwide census providing NHTSA, Congress and the American public yearly data regarding fatal injuries suffered in motor vehicle traffic crashes.

Fixing America's Surface Transportation Act (**Fast Act)** A funding and authorization bill to govern United States Federal surface transportation spending, signed by President Obama on December 4, 2015. It is subsequent to MAP-21, but does not replace all of the applicable requirements of that earlier law, so both must be referenced.

Fatal Crash Any motor-vehicle crash that results in one or more deaths within 30 days of the crash.

Fatality Rate The number of traffic fatalities per number of vehicle miles traveled or per population in a given year. The rate is usually expressed in terms of fatalities per one hundred million miles traveled and fatalities per one million or one hundred thousand people.

Federal Highway Administration (FHWA) An agency within the U.S. Department of Transportation that supports State and local governments in the design, construction, and maintenance of the Nation's highway system (Federal Aid Highway Program) and various federally and tribal owned lands (Federal Lands Highway Program).

Fixed Speed Camera A camera installed to detect traffic regulation violations.

Freeway Directional travel lanes usually separated by a physical barrier, and access and egress points are limited to on-and off-ramp locations or a very limited number of at-grade intersections.

Functional Classification The class or group of roads to which the road belongs. There are three main functional classes as defined by the United States Federal Highway Administration: arterial, collector, and local.

High Crash Location Highway or road segments that are susceptible to an inordinate number of crashes. Identification of high crash locations is part of the problem identification process.

High Injury Corridors and Intersections (regional) Roadways where the highest concentrations of fatal and severe injury crashes involving people in cars, biking and walking occur on the Regional Transportation Network. Corridors and intersections were analyzed to determine aggregate crash scores based on the frequency and severity of crashes, using the following methodology:

- Fatal and Injury A (serious) crashes for all modes are assigned to the network; "Injury B", "Injury C", and "PDO (property damage only)" crashes involving bikes and pedestrians are also assigned to the network.
- Fatal and Injury A crashes are given a weight of 10.
- Roadways are analyzed in mile segments; if a segment has only one Fatal or Injury A crash it must also have at least one B/C (minor injury) crash, for the same mode, to be included in the analysis.
- Roadway segments are assigned an N-score (or "crash score") by calculating the weighted sum by mode and normalizing it by the roadway length. To reach 60 percent of Fatal and Severe Injury crashes, roadway segments had to have an N-score of 39 or higher; high injury Bicycle Corridors had to have an N-score of 6 or more, and high injury Pedestrian Corridors had to have an N-score of 15 or more. Intersections with the highest weighted crash scores were also identified; 5 percent of intersections had an N-score (or "crash score") higher than 80 and are also shown on the map, and 1 percent of intersections (the top 1%) had to have an N-score higher than 128.

High Risk Roadways Characteristics if high risk roads are identified by looking at crash history on an aggregate basis to identify particular severe crash types (e.g. pedestrian) and then use the roadway characteristics associated with particular crash types (e.g. arterial

roadways with four-or more lanes, posted speed over 35 mph, unlit streets) to understand which roadways may have a higher risk of the same type of severe crash.

High Visibility Enforcement (HVE) Law enforcement efforts that are highly visible and well publicized through paid and earned media support.

Highway Safety Improvement Program (HSIP) Projects, activities, plans, and reports carried out under 23 USC section 148.

Highway Safety Improvement Project (23 USC section 148) In general, the term "highway safety improvement project" means strategies, activities, and projects on a public road that are consistent with a state strategic highway safety plan and correct or improve a hazardous road location or feature; or address a highway safety problem.

Historically Marginalized Communities Are communities of people that have been historically excluded from critical aspects of social participation including, voting, education, housing and more. Historical marginalization is often a result of systematic exclusion based on devaluation of any individual existing outside of the dominant culture.

Highway Safety Manual (HSM) The recognized source of information and methods for quantitatively evaluating traffic safety performance on existing or proposed roadways.

Highway Safety Plan (HSP) Grant application submitted for Federal section 402 and similar funds. Funds are provided by the National Highway Traffic Safety Administration and the Federal Highway Administration.

Impaired Driving Driving a vehicle while the driver's reflexes have suffered from alcohol or other drugs to a point that is generally considered unsafe to operate a vehicle.

Injury A/ Incapacitating Injury/ Severe Injury Synonymous terms referring to an injury from a motor-vehicle crash that prevents the injured party from walking, driving, or normally continuing the activities they were capable of performing before the injury occurred. Examples include severed, broken or distorted limbs, skull or chest injuries, abdominal injuries, unconscious at or when taken from the crash scene, unable to leave crash scene without assistance, etc.

Injury B / Moderate injury/ Visible Injury Synonymous terms referring to injuries from a motor-vehicle crash which are evident to observers at the scene of the crash. Examples include a visible lump, abrasions, cuts, bruises, lacerations, etc.

Injury C/ Minor injury/ Complaint of Pain Synonymous terms referring to injuries indicated by the victim. Examples include momentary unconsciousness, complaint of pain, limping, nausea, etc.

Intelligent speed adaption technologies Are any system that ensures that vehicle speed does not exceed a safe or legally enforced speed. In case of potential speeding, a human driver can be alerted, or the speed reduced automatically.

KABCO Injury Scale An injury rating scale used to determine the severity of injuries ranging from Severe Injury (A) to Minor Injury (C), and property damage only (O).

Local Street A functional classification for surface streets that includes all public surface streets not defined as arterial or collector. Local streets are typically low-speed streets with low traffic volumes in residential areas, but also include similar streets in commercial and industrial areas.

Moving Ahead for Progress in the 21st Century Act (MAP-21) (P.L. 112-141) Reauthorization of Federal highway funding, signed into law by President Obama on July 6, 2012. Subsequent adoption of the FAST Act does not replace MAP-21 in all areas regulation of transportation safety planning and funding, so both must be referenced.

Metro Planning Area Boundary (MPA)

Minor Arterial Provides moderate-length trips and offers connectivity to the higher arterial system, providing intracommunity continuity.

Model Minimum Uniform Crash Criteria Guideline (MMUCC) A minimum, standardized data set for describing motor vehicle crashes and the vehicles, persons and environment involved. The Guideline is designed to generate the information necessary to improve highway safety within each state and nationally.

Monitoring Management and oversight of the day-to-day operations of grant and sub-grant supported activities to assure compliance with applicable Federal and state requirements and that performance goals are being achieved.

Motorcycle A motor vehicle with motive power having a seat or saddle for the use of the rider and designed to travel on not more than three wheels in contact with the ground. The NHTSA defines “motorcycle” to include mopeds, two or three-wheeled motorcycles, off-road motorcycles, scooters, mini bikes and pocket bikes.

Metropolitan Planning Organization (MPO) Coordinates transportation planning in an urbanized area of the state.

Manual on Uniform Traffic Control Devices (MUTCD) A document issued by the Federal Highway Administration of the United States Department of Transportation to specify the standards by which traffic signs, road surface markings, and signals are designed, installed, and used.

National Highway Traffic Safety Administration (NHTSA) An agency of the Executive Branch of the U.S. government, part of the Department of Transportation. It describes its mission as "Save lives, prevent injuries, reduce vehicle-related crashes."

National Transportation Safety Board An independent U.S. government investigative agency responsible for civil transportation accident investigation. In this role, the NTSB

investigates and reports on aviation accidents and incidents, certain types of highway crashes, ship and marine accidents, pipeline incidents, and railroad accidents.

Older adults (vulnerable) The Moving Ahead for Progress in the 21st Century (MAP-21) Act created a new Special Rule for older drivers and pedestrians under 23 USC 148(g)(2), which was continued under the Fixing America's Surface Transportation (FAST) Act. If the rate per capita of traffic fatalities and serious injuries for drivers and pedestrians over the age of 65 in a State increases over the most recent 2-year period, this Special Rule requires a State to include strategies to address the increases in those rates in their State Strategic Highway Safety Plan (SHSP). FHWA issued the Section 148: Older Drivers and Pedestrians Special Rule Final Guidance in May 2016.[54]

TriMet's Coordinated Transportation Plan for Seniors and Persons With Disabilities identifies several principles and actions related to addressing safety and security concerns getting to, at transit stops and on transit.

Oregon Department of Transportation (ODOT)

Operating Speed The speed at which motor vehicles generally operate on that road.

Per Capita Or, per person. Used to describe crash rate per population. Except where otherwise noted, crash rates are per million residents.

Per vehicle miles traveled (VMT): Is used to describe crash rate per motorized vehicle miles. Except where otherwise noted, crash rates are per 100-million motorized vehicle miles travelled.

Performance Measure A process of assessing progress toward achieving predetermined goals, including information on the efficiency with which resources are transformed into goods and services (outputs), the quality of those outputs (how well they are delivered to clients and the extent to which clients are satisfied) and outcomes (the results of a program activity compared to its intended purpose), and the effectiveness of government operations in terms of their specific contributions to program objectives.

Portland Metro Region Comprised of twenty-five cities and the urbanized area of Clackamas, Multnomah and Washington Counties. Is the geographic scope of this document, and is defined as area within the Metropolitan Planning Area boundary.

Posted Speed Violations In Oregon, posted speeds set the maximum speed that can be traveled, violations can be either speed limit or basic rule.

Posted Speed The speeds indicated on signs along the roadway. When speeds differ from statutory speeds there must be a posted sign indicating the different speed.

[54] U.S. Department of Transportation, Federal Highway Administration Older Drivers and Pedestrians Special Rule. https://safety.fhwa.dot.gov/hsip/older/

Protected Bike Lanes (separated bike lane, cycle track)A bike lane that is physically separated from auto traffic, typically they are created using planters, curbs, parked cars, or posts and are essential for creating a complete network of bike-friendly routes. For bicyclists, safety increases significantly when there is physical separation from motorists through infrastructure. Fully protected bikeways can reduce bicycle injury risk up to 90 percent.[55] Another report found that on-street bike lanes that use barriers to physically separate bicyclists from motor vehicles are 89 percent safer than streets with parked cars and without bicycling infrastructure. When physical separation is not possible, infrastructure such as striped bike lanes, bicycle boulevards, and bike boxes help reduce the risk of conflict with motor vehicles.[56]

Public Health The health of the population as a whole, especially as monitored, regulated, and promoted by the state.

Racial Equity When race can no longer be used to predict life outcomes and outcomes for all groups are improved.

Road Safety Audit A formal safety performance examination of an existing or future road or intersection by an independent multidisciplinary audit team. (23 CFR § 924.3).

Road Users A motorist, passenger, public transportation operator or user, truck driver, bicyclist, motorcyclist, or pedestrian, including a person with disabilities. (23 USC section 148)

Roadway Departure Crash A type of crash. As used in this plan, note that the roadway or lane departure definition excludes intersections, pedestrian-related, and bicycle-related crashes.

Regional Transportation Plan for a Metropolitan Planning Organization

Safety (transportation) Protection from death or bodily injury from a motor-vehicle crash through design, regulation, management, technology and operation of the transportation system.

Safe Routes to School A comprehensive engineering/education program focused on youth school travel that aims to create safe, convenient, and fun opportunities for children to walk and roll (bike, scooter, etc.) to and from schools. City or school district based programs incorporate evaluation, education, encouragement, engineering, enforcement, and equity with the goal of increasing walking and rolling to school.

Safe System Approach (otherwise known as Vision Zero, Towards Zero Deaths, Road to Zero or Sustainable Safety) Views human life and health as paramount to all else and should be the first and foremost consideration when designing a road network.

[55] "Route Infrastructure and the Risk of Injuries to Bicyclists: a Case-Crossover Study," Teschke, et al. American Journal of Public Health, Vol. 102, No. 12, December 2012.
[56] A Right to the Road, p.48, GHSA, 2017.

Safety Data Includes, but is not limited to, crash, roadway, and traffic data on all public roads. For railway- highway grade crossings, safety data also includes the characteristics of highway and train traffic, licensing, and vehicle data. (23 CFR § 924.3)

Security (public and personal) Protection from intentional criminal or antisocial acts while engaged in trip making through design, regulation, management, technology and operation of the transportation system.

Serious Crash In this document refers to the total number of Fatal and Severe Injury (Injury A) crashes combined.

Severity A measurement of the degree of seriousness concerning both vehicle impact (damage) and bodily injuries sustained by victims in a traffic crash.

Strategic Highway Safety Plan (SHSP) A comprehensive, multi-disciplinary plan, based on safety data developed by a State Department of Transportation in accordance with 23 U.S.C. 148.

Side Guard for Trucks Vehicle-based safety devices designed to keep pedestrians, bicyclists, and motorcyclists from being run over by a large truck's rear wheels in a side-impact collision.

Social Equity The idea that all members of a societal organization or community should have access to the benefits associated with civil society – the pursuit of an equitable society requires the recognition that there are a number of attributes that give members of a society more or less privilege and that in order to provide equitable situations the impacts of these privileges (or lack thereof) must be addressed. For transportation, equity refers to fair treatment or equal access to transportation services and options. In the context of safety, transportation equity relates to improving the travel choices, the safety of travel and not unfairly impacting one group or mode of transportation. More specifically it means improved safety for all transportation options and lessening the risks or hazards associated with different choices of transportation.

Speed Limit Speed limits are limited to specific roadways such as interstates, roadways within city limits, and school speed zones. In addition, speed limits apply to certain types of vehicles on any roadway – large trucks, school buses and vehicles transporting children or workers.

Speeding Driving too fast for conditions and/or driving in excess of posted speed.

Speed-Related Crashes Attributes of crash include driving too fast for conditions and/or driving in excess of posted speed (note that duplicate crashes are not counted more than once).

Safety Priority Indexing System (SPIS) A systemic scoring method that identifies potential safety problems on state highways.

Spot Safety Improvement An improvement or set of improvements that is implemented at a specific location on the basis of location-specific crash experience or other data-driven means.

State Strategic Highway Safety Plan A comprehensive, multi-disciplinary plan, based on safety data developed by a State Department of Transportation in accordance with 23 U.S.C. 148.

State Highway Safety Improvement Program A program of highway safety improvement projects, activities, plans and reports carried out as part of the Statewide transportation improvement program under section 135(g). (23 USC section 148)

Statutory Speeds Are posted as defined in statute (e.g., 25 mph on a neighborhood street) and any road authority may post applicable statutory speeds within their jurisdiction.

Statewide Transportation Improvement Program (STIP) Oregon Department of Transportation's capital improvement program for state and federally-funded projects.

Strategic Highway Safety Plan (SHSP) A comprehensive, multi-disciplinary plan, based on safety data developed by a State Department of Transportation in accordance with 23 U.S.C. 148.

Systemic Safety Improvement An improvement or set of improvements that is widely implemented based on high-risk roadway features that are correlated with particular severe crash types.

Toward Zero Deaths A term analogous to Vision Zero.

Transportation Demand Management (TDM) Application of strategies and policies to reduce travel demand.

Transportation Planning Rule (TPR) Oregon's statewide planning goals established state policies in 19 different areas. The TPR implements the Land Conservation and Development Commission's Planning Goal 12 (Transportation) which requires ODOT, MPOs, Counties and Cities, per OAR 660-012-0015 (2) and (3), to prepare a Transportation System Plan (TSP) to identify transportation facilities and services to meet state, regional and local needs, as well as the needs of the transportation disadvantaged and the needs for movement of goods and services to support planned industrial and commercial development, per OAR 660-012-0030(1).

Transportation Safety Action Plan (TSAP)

Vision Zero A system and approach to public policy developed by the Swedish government which stresses safe interaction between road, vehicle and users. Highlighted elements include a moral imperative to preserve life, and that the system conditions and vehicle be adapted to match the capabilities of the people that use them.

Vehicle miles traveled (VMT) The number of vehicle mile traveled within a given geography and time frame.

Vulnerable Users In this document, refers to groups of people that are more vulnerable to being killed or severely injured in traffic crashes. Vulnerable users are people that are more vulnerable to being killed or seriously injured in crashes. Vulnerable users are pedestrians, bicyclists, motorcycle operators, children, older adults, road construction workers, people with disabilities, people of color and people with low income.

APPENDIX

2018 Metro State of Safety Report

Describes the data used in the analysis, the attributes of the data, and any data limitations. Describes the process Metro used to analyze the data. The 2018 Metro State of Safety Report presents the findings, identifying trends and relationships of serious crashes with environmental factors including roadway and land use characteristics and serves as the foundation for the Regional Safety Strategy.

Access online at: [to be added]

DRAFT

If you picnic at Blue Lake or take your kids to the Oregon Zoo, enjoy symphonies at the Schnitz or auto shows at the convention center, put out your trash or drive your car – we've already crossed paths.

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