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# Regional Transportation Safety Plan

Improving transportation safety for the Portland metropolitan area

**May 11, 2012**

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**Metro is the federally mandated metropolitan planning organization** designated by the governor to develop an overall transportation plan and to allocate federal funds for the region.

The Joint Policy Advisory Committee on Transportation (JPACT) is a 17-member committee that provides a forum for elected officials and representatives of agencies involved in transportation to evaluate transportation needs in the region and to make recommendations to the Metro Council.

The established decision-making process assures a well-balanced regional transportation system and involves local elected officials directly in decisions that help the Metro Council develop regional transportation policies, including allocating federal transportation funds.

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## DEFINITIONS

Terms that are used throughout this report are defined as follows:

"**Portland Metro region**" is the scope of this study, and is defined as area within the Urban Growth Boundary (UGB) as of December 31, 2011.

"**Injury A**" and "**Incapacitating injury**" are used interchangeably. Incapacitating injuries typically are injuries that the victim is not able to walk away from. They are synonymous with the term "**Severe injury**"

"**Injury B**" and "**Moderate injury**" are used interchangeably.

"**Injury C**" and "**Minor injury**" are used interchangeably.

"**Serious Crashes**" in this report refers to the total number of Fatal and Injury A crashes.

**Per capita** is used to describe crash rate per population. Except where otherwise noted, crash rates are per million residents.

**Per 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.

**Arterial** is 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.

**Collector** is 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.

**Local** is 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.

## EXECUTIVE SUMMARY

Transportation safety is a critical public health issue in the United States. Nationwide, crashes killed an average of 37,500 people per year between 2007 and 2009. During that same time period in Oregon, there were roughly 42,500 traffic crashes and 1,111 people were killed on the state's roadway system, averaging 370 fatalities annually. Traffic crashes are the leading cause of accidental deaths in the United States, and the leading cause of deaths of all kinds for ages 15 – 34[1].

The Portland Metro region, with a population of about 1.4 million, comprises almost 40 percent of the state's population. Between 2007 and 2009, in the Portland Metro region there were more than 18,000 crashes including 159 fatalities and 1,444 crashes resulting in a serious injury. This represents 43% of the state's crashes, 14% of its fatalities, and 36% of its serious injury crashes. The annual economic cost to the region of these crashes is estimated at $958 million[2].

It is the Portland Metro region's adopted goal to reduce the number of pedestrians, bicyclists, and automobile occupants killed or seriously injured on the region's roadways each by 50% by 2035 compared to 2005. A 50% reduction in all crash types would therefore be a saving of $479 million annually in economic costs to the Metro region. This is an ambitious but important step toward realizing the larger vision of zero deaths.

The Regional Transportation Safety Plan (RTSP) is the first of its kind for this region. The goal of the RTSP is to help the region reduce fatalities and serious injury crashes. This work builds on the efforts of the Oregon Department of Transportation's (ODOT) recent adoption of the Transportation Safety Action Plan (TSAP). The RTSP is based on the coordinated efforts of many local agencies, organizations and individuals through the Regional Safety Workgroup. The Workgroup was formed in October 2009 to begin exploring ways to better integrate safety into the transportation planning process.

The RTSP serves as a data-driven framework and specifically urban-focused safety plan to build upon ODOT's statewide success and reduce fatalities and serious injuries in the Portland Metropolitan region. Metro, in coordination with the Regional Safety Workgroup analyzed crash data provided by ODOT and produced the first State of Safety in the Region report. This report provides the data foundation of the RTSP. Some of the key findings from the data are:

- Arterials have the highest serious crash rate for all modes.
- Alcohol and drugs are a primary contributing factors to fatal crashes.
- Speeding and aggressive driving are the leading contributing factors toward serious crashes.
- Serious pedestrian crashes are disproportionately represented after dark.

[1] Source: CDC, Deaths: Final Data for 2009

[2] *Oregon Department of Transportation, Comprehensive Economic Value per Crash table,* http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/docs/excel/BC_Form.xls (Appendix X.X)

- Serious nighttime pedestrian and bicycle crashes occur disproportionately where street lighting is not present.
- Streets with more traffic lanes have particularly high serious pedestrian crash rates per mile and per VMT.

The RTSP aims to address these findings and help to meet the RTP target for reducing fatalities and serious injuries for all crashes by 50 percent. The key recommendations for improving safety in the Portland Metropolitan region are:

- Continue data collection and analysis of ODOT crash data to support regional and local planning efforts.
- Develop scorecard/performance measures for identifying high crash mobility corridors and high crash arterials across the region.
- Convene targeted workgroup of expanded safety professionals to develop targeted strategies to reduce the prevalence of driving under the influence of alcohol and drugs, speeding and aggressive driving.
- Focus on improved pedestrian crossings including lighting, particularly on multi-lane arterials.
- Focus on providing protected bicycle facilities such as buffered bike lanes, cycle tracks, multi-use paths, or low-traffic alternative routes along high-volume and/or high-speed roadways.
- Further explore bicycle and pedestrian safety and identify projects as part of the Regional Active Transportation Plan currently underway.

Metro will be working with regional partners over the next year to work on these recommendations for reducing fatalities and serious injuries on the region's roadway system.

## 1.0 INTRODUCTION

With the federal surface transportation legislation TEA-21 in 1998, safety and security appeared as planning factors for metropolitan planning organizations (MPOs) to address in transportation planning. SAFETEA-LU, adopted in 2005, placed a greater emphasis on addressing safety. Over the last few years MPOs across the country have struggled to effectively incorporate safety into the transportation planning process. In fact for many MPOs safety was incorporated in name only with a goal statement often independent from a data driven detailed analysis of safety.

Since fall 2009, responding to a Federal Highway Administration recommendation, Metro has been working with local governments, ODOT, TriMet, practitioners and researchers to draft a Regional Transportation Safety Plan (RTSP). The RTSP serves as a data-driven framework and specifically urban-focused safety plan to build upon ODOT's statewide success and reduce fatalities and serious injuries in the Portland Metropolitan region.

The outline for the RTSP is:

- **Section 1** – An introduction to the report
- **Section 2 –** An assessment of federal, state and regional transportation goals and policies as they relate to safety, and highlights of local agency efforts to improve transportation safety.
- **Section 3** – Summary of regional trends in the crash data and compared to state, national and international trends, including an analysis of fatal and serious injury crashes in the region and their relationship to transportation and land use patterns.
- **Section 4** – Recommendations for implementing safety strategies to help meet the 2035 RTP target of reducing fatalities and serious injuries by 50% or more.

### PURPOSE

The 2035 Regional Transportation Plan established a performance target for a 50% reduction in fatalities and serious injuries for pedestrians, bicyclists, and motor vehicle occupants by 2035 as compared to 2005. The purpose of the RTSP is to identify ways to help the region meet this goal and reduce fatalities and serious injury crashes. Unlike the TSAP adopted by ODOT that looks at statewide crash trends, this plan focuses on the Portland Metro region and is specifically urban-focused. It provides a data-driven framework to identify trends in the region's crashes and recommends short-term and long-term strategies to begin to reduce fatalities and serious injuries for all modes on the region's roadways.

### THE 5 E'S OF SAFETY

When considering the safety of the transportation system, it is important to think about the built environment, the vehicles, and the user including pedestrians, bicyclists and drivers. Research indicates that the vehicle, the roadway and the user are a factor in roughly 12, 34 and 93 percent of traffic crashes respectively. Therefore it is imperative that safety solutions be multidisciplinary and multimodal in nature. A common application of a multidisciplinary approach exists in the 5 E's of transportation safety:

- *Education* – Through education, all transportation system users, including pedestrians, bicyclists, and drivers of all ages develop awareness of how their behavior contributes to safety.
- *Emergency Medical Service (EMS)* – EMS consists of a highly organized system ensuring prompt notification of the location and severity of a crash, timely dispatch of trained emergency care providers, use of evidence-based treatment protocols and triage to an appropriate health care facility.
- *Enforcement* – High visibility enforcement as a deterrent to the violation of traffic laws.
- *Engineering* – Building a safe and efficient multimodal transportation system to meet the needs of all users.
- *Evaluation* – Review processes to track progress

The 5 E's encompass a broad group of solutions administered by a wide variety of stakeholders responsible for making the transportation system safe for all users. To reduce fatalities and serious injuries, the Portland Metropolitan region will need to build on the efforts of these stakeholders. The RTSP recommendations in Section 4 will identify strategies to incorporate all of the 5 E's.

## 2.0 FEDERAL, STATE & REGIONAL POLICY FRAMEWORK

The following provides an overview of the policies that currently exist at the federal, state and regional level related to transportation safety. It also provides highlights of programs and projects that local agencies in the Portland Metropolitan region are doing to address serious crashes.

### FEDERAL POLICIES

The federal transportation planning process requires MPOs to address eight planning factors. The degree to which each factor is addressed will vary depending on the unique conditions of the area, but efforts should be made to think through and carefully consider how to address each factor. The safety factor has created challenges for some MPOs as to how safety should be addressed. SAFETEA-LU established the Highway Safety Improvement Program (HSIP) as a core Federal-aid program for the first time indicating the importance attached to transportation safety at the federal level. The overall purpose of this program is to achieve a significant reduction in traffic fatalities

and serious injuries on all public roads through the implementation of infrastructure-related highway safety improvements.

A key requirement of the HSIP is that all states must develop a Strategic Highway Safety Plan (SHSP), in consultation with other key state and local highway safety stakeholders. Consequently, the MPO must be familiar with the SHSP in order to identify MPO goals and strategies that would address safety, and integrate SHSP goals and strategies into the activities and planning efforts of the MPO; likewise, the SHSP should consider the safety needs and strategies identified in the MPO safety plan.

Recently a shift has started at the federal level to developing a national strategy for reducing fatalities on the nation's roads. The strategy emphasizes that even one death on national roadway system is too great. A recent publication, *Toward Zero Deaths: A National Strategy on Highway Safety* is part of USDOT's development of a national strategy with National Cooperative Highway Research Program Project 17-51 expected to be completed at the end of 2012.

## STATE POLICIES AND PROGRAMS

The Oregon Transportation Plan (OTP) is the long-range blueprint for the state's transportation system. The OTP's Goal 5 – Safety and Security, sets statewide policy for improving the safety for all modes and transportation facilities. The OTP serves as the framework for the development and updates to the TSAP. Based on both the OTP and TSAP, the Oregon Highway Plan contains Policy 2F: Traffic Safety, with the following actions:

- *2F1* - Establish a process to develop and implement the most cost-effective solutions to high priority safety problems.
- *2F2* - Whenever safety improvement is the stated objective of the project, include goals and a process to evaluate the outcome and further refine the project selection and solution process.
- *2F3* - In identifying solutions to traffic safety problems, consider solutions including, but not limited to:
    - Increasing traffic enforcement
    - Involving business and community groups and the media in education efforts
    - Using educational materials and special signing to change driving practices
    - Making engineering improvements such as geometrics, signing, lighting, striping, signals, improving sight distance, and assessing conditions to establish appropriate speed
    - Constructing appropriate bicycle and pedestrian facilities including safe and convenient crossings
    - Managing access to the highway
    - Developing incident response and motorist assistance programs
    - Ensuring the uniformity of traffic control devices
    - Developing driver information systems

- *2F4* - Continue to develop and implement the Safety Management System to target resources to sites and routes with the most significant safety problems. Encourage local governments to adopt a safety management system.
- *2F5* - Seek additional funding for state and local traffic law enforcement.
- *2F6* - Work with citizens and local jurisdictions to address safety concerns on the state highway system(1999 Oregon Highway Plan, pages 112-115.)

To help identify the priority facilities for safety improvements, ODOT developed the Safety Priority Index System (SPIS) which is used as part of the HSIP analysis. The SPIS score is based on three years of crash data and considers crash frequency, crash rate, and crash severity. A roadway segment becomes a SPIS site if a location has three or more crashes **or** one or more fatal crashes over the three year period. SPIS sites are 0.10 mile sections on the state highway system.

Each year, a list of the top 10% SPIS sites on state highway facilities is generated and the top 5% sites are investigated by the five Region Traffic Manager's offices. These sites are evaluated and investigated for safety problems. If a correctable problem is identified, a benefit/cost analysis is performed and appropriate projects are initiated, often with funding from the Highway Safety Improvement Program (HSIP). Regions report the results of their site evaluations to the State Traffic Engineer. These results are incorporated into the HSIP 5% report to FHWA by August 31 of each year.

SAFETEA-LU not only increased funding for safety, but it raised its stature by requiring each state department of transportation (DOT) to develop a data-driven Strategic Highway Safety Plan (SHSP) in coordination with its partners. State DOTs are required to consult with MPOs as part of the SHSP development. Periodically, the Oregon Department of Transportation (ODOT) updates the state SHSP that is called the Transportation Safety Action Plan (TSAP). The TSAP sets statewide goals, objectives and targets for reducing fatalities and serious injuries on the state transportation system. It focuses on education and enforcement and provides a set of general strategies to address safety issues across the state.

The Oregon Transportation Safety Action Plan (OTSAP) was recently adopted by the Oregon Transportation Commission in October 2011. The OTSAP guides ODOT's safety investment decisions through a set of Emphasis Area actions to help respond to the contributing factors that contribute to the greatest number of transportation-related fatalities and injuries. The following are the ten priority OTSAP actions:

1. *Safety areas of interest should include intersection crashes, roadway departure, and pedestrian/bicycle.* – State and local governments must work to improve key Infrastructure Safety Emphasis Areas. These areas should include, but not be limited to the following:

    - Intersection crashes – Investigate the usefulness of advance signing, access management techniques, advance technology and features, and improvements to signal timing to smooth traffic flow.
    - Roadway Departure Crashes (including run off the road and head-on crashes) – Investigate the usefulness of rumble strips, shoulder widening, median widening, cable

barrier, raised medians, durable marking, fixed object removal, roadside improvements, safety edge, and other countermeasures and safety treatments of centerline.

- Ped/Bike Crashes – Investigate the usefulness of curb bulb-outs, refuge islands, warning signage improvements and other countermeasures for pedestrian crashes, investigate improvements in traffic controls for bicycles and improvements at intersections to better accommodate pedestrians and bicycles such as bicycle signals and rectangular rapid flash beacons.
- Further develop and institutionalize the ODOT Safety Corridor and Roadway Safety Audit programs within ODOT. ODOT should embrace the blending of the "4 E approach to transportation safety" as described in FHWA's Office of Safety Mission Statement (Engineering, Education, Enforcement, and Emergency Services).

2. *Create a plan to ensure that safety is considered in construction/repair decisions.* – Develop a plan or series of plans and policy changes designed to improve the likelihood that when construction or repair decisions are made, safety is the highest weighted consideration.

- Develop tools to assist in weighing the best safety choices that balance risk and benefit
- Identify and implement incremental improvements and changes that tilt systems and policies toward safety.
- Establish tangible safety goals or targets at ODOT Region and District levels. Evaluate possibility of localized safety planning in conjunction with local governments.
- Develop one or more funding mechanisms that allow for quick intervention on emerging safety issues.
- Identify a safety champion for ODOT to assure that safety has a voice in the decision-making processes.

*3. Develop a communications strategy for raising awareness and acceptance of the need for law enforcement.*

4. *Establish processes to train enforcement personnel, attorneys, judges, and DMV staff.* – Continue efforts to establish processes to train enforcement personnel, deputy district attorneys, judges, DMV personnel, treatment providers, corrections personnel and others. An annual training program could include information about changes in laws and procedures, help increase the stature of traffic enforcement, and gain support for implementing changes.

5. *Pass legislation to establish .04 percent BAC.* – Pass legislation to establish .04 percent BAC as the standard for measuring alcohol impairment for all Oregon drivers 21 years old and older. Continue the zero tolerance law for persons under 21. Initially request legislation requiring that repeat offenders be required to adhere to the .04 standards. Once this step has been proven successful, request the standard be expanded to all drivers.

6. *Improve and expand the delivery system for driver education in Oregon.* – Consider the following in designing a model program:

- Identify and promote strategies that establish a driver and traffic safety education system. This system should promote life-long driver learning and foster a commitment to improve driver performance throughout the driver's life span.
- Continue to support legislation to make driver education mandatory for new drivers under the age of 18.
- Evaluate the possibility of funding the increased cost of providing this additional training by raising learning permit fees.
- If feasible, by the year 2015 extend this requirement to all persons seeking their first driver license.
- Improve standards to support quality driver and traffic safety education programs.
- Establish a definition of what a new model driver is in terms of knowledge, skill, behavior and habits needed. These standards should include specific requirements for ongoing professional development.
- Evaluate the possibility of establishing a licensing process that measures driver readiness as defined by the new model driver, and employs a process that facilitates the safety means to merge the learning driver into mainstream driving.
- Establish program content standards that apply to every driver education program.
- Continue to develop oversight and management standards that hold the driver education system accountable. These standards should encourage quality and compel adherence to program standards.
- Create a partnership to support driver education. Identify and promote best practices for teaching, and learning among and between parents, educators, students and other citizens.

7. *Continue public education efforts aimed at proper use of child safety seats.*
8. *Consider legislation requiring the inclusion of helmets, reflective gear and lighting with new bicycles.*
9. *Work with partner agencies to position Oregon's EMS system as world class and affordable for the average Oregonian.* – Work with partner EMS agencies, providers, committees, volunteers, and concerned citizens to position Oregon's EMS system as world class. Raise awareness of the life-saving importance of EMS personnel and equipment to encourage statewide support and involvement. Increase emphasis on the need for well-trained personnel and equipment in rural and volunteer agencies. Create and fund affordable, local and accessible EMS training statewide for pre-hospital and hospital personnel responding to motor vehicle crashes, aid in reaching and sustaining this goal. Continue work towards meeting and exceeding national standards.
10. *Develop strategies to assure the recruitment and retention of EMS volunteers.* – Work to place a state focus on volunteer creation and development. Develop strategies to assure the recruitment and retention of EMS and fire volunteers. Work to assure that the EMS education standards are attainable to volunteers in terms of time, costs, and resource demands. Develop easy, effective entry points for EMS and fire volunteers. Work with

affected agencies and local jurisdictions to identify existing and emerging barriers to volunteer participation in the EMS and fire systems.

## REGIONAL POLICY CONTEXT

In 2008 the Metro Council, with guidance from the Metro Policy Advisory Committee (MPAC), agreed that our planning efforts should start with defining the desired outcomes that the residents of this region have consistently expressed when asked. To that end, the Metro Council and our regional partners adopted six desired outcomes to guide regional planning for the future. The 2035 RTP establishes an outcomes-based planning and decision-making framework to ensure transportation decisions support the six desired outcomes.

Safety is an essential element of the region's desired outcomes, to ensure people have safe and reliable transportation choices. The 2035 Regional Transportation Plan (RTP) lays out the region's transportation concepts and policies that will result in a complete and interconnected transportation system that supports all modes of travel and implementation of the 2040 Growth Concept. Goal 5 of the RTP is to Enhance Safety and Security and to ensure that multi-modal transportation infrastructure and services are safe and secure for the public and goods movement.

In 2008, as part of the quadrennial federal certification review, Metro received a recommendation from the Federal Highway Administration (FHWA) to better incorporate safety into the MPO planning process. FHWA then sponsored a 1.5-day workshop titled, "Incorporating Safety into the Transportation Planning Process," in September 2009 that involved the 6 Oregon MPOs, Southwest Regional Transportation Council (the Vancouver, Washington region's MPO), the Oregon Department of Transportation (ODOT), TriMet and local jurisdictions. In response to the FHWA recommendations, Metro organized an ad-hoc Regional Safety Workgroup in October 2009 to begin exploring ways to better integrate safety into the transportation planning process. The Workgroup is comprised of the Metro region's cities and counties, Metro, TriMet, ODOT, researchers from Portland State University and practitioners specializing in transportation safety.

From the onset Workgroup participants highlighted the importance for creating a data driven approach to incorporate safety data into regional land use and transportation decisions. The Workgroup developed a list of core activities to help Metro focus its safety efforts:

- Improve safety data aggregation and analysis
- Include safety in the development of performance measures
- Use quantitative safety measures in project selection for the RTP and MTIP (Metropolitan Transportation Improvement Program)
- Incorporate safety into Metro's programs, policies, and design best practices
- Encourage the development of a safety culture in member jurisdictions by including safety more directly in the transportation planning, design, construction, and maintenance practices.

- Sharing techniques, needs, accomplishments, and best practices in safety among member jurisdictions

This preliminary framework helped guide the Workgroup's discussion topics and related work products. Highlights of these activities are in **Table 1** below:

**Table 1 - Regional Safety Workgroup Activities**

| Discussion Topic | Activities |
|---|---|
| Data Collection, Visualization and Analysis | • Metro received state crash data for 2007, 2008 and 2009 from ODOT Salem's Crash Analysis and Reporting Unit for the tri-county region. Metro reviewed the data and has formatted it for use by all local governments.<br>• Metro has also conducted an analysis of the safety data that is the basis for the Regional Safety Plan. |
| Workgroup Mission Statement | • Developed the following mission statement to help focus the workgroup's efforts:<br><br>*To support the 2035 RTP target of reducing fatalities and serious injuries by 50%, the mission of the Safety Workgroup is to promote collaboration and commitment among regional partners to plan, build and operate a transportation and land use system that prevents fatal and serious injury crashes in the Portland Metro region. The Safety Workgroup will engage regional partners to consider, evaluate and implement regional multi-disciplinary safety solutions. These include, but are not limited to land use, design, engineering, education, enforcement, and emergency services. The Safety Workgroup will operate from a data-driven foundation and support the improvement and use of safety data and inform transportation and land use decisions at the regional level.* |
| Performance Measures | • Developed safety performance target for the 2035 RTP (shown on the following page). |
| State and Regional Safety Funding | • Used Workgroup to review and evaluate candidate projects for the Metro Regional Flexible Fund Allocation process for addressing safety.<br>• Reviewed ODOT Region 1 safety projects as part of the State Transportation Improvement Program (STIP).<br>• Discussed regional, state and local funding of safety projects. |
| Future Research Topics | • Developed a list of research topics to take advantage of future grant opportunities. |

| | |
|---|---|
| Design Best Practices | • Discussed new ITE recommended practice in publication *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach* |
| Highway Safety Manual (HSM)/Multimodal Level of Service | • Discussed recently published HSM and safety analysis tools |
| Road Safety Audits (RSAs) | • ODOT Region 1 hosted a training for local governments, agencies and consultants to learn the process for conducting RSAs |

**2035 RTP Performance Target**

In December 2009, ODOT Region 1 wrote a letter to JPACT requesting that Metro refine the safety performance target for the 2035 Regional Transportation Plan (RTP) and to start work on a Traffic Safety Plan to be completed by December 2011. The Regional Safety Workgroup's first task was to develop the performance target below that was adopted as part of Metro's 2035 RTP in June 2010.

| |
|---|
| **Safety** – By 2035, reduce the number of pedestrian, bicyclist, and motor vehicle occupant fatalities plus serious injuries each by 50% compared to 2005. |

In addition to the 2035 RTP performance target, safety performance measures will be included in the next update to the Regional Mobility Corridor Atlas, the Congestion Management Process and RTP update.

## PORTLAND METRO REGION LOCAL AGENCY SAFETY PROJECTS & PROGRAMS

Local agencies across the region are doing a wide variety of actions to improve the safety of the region's transportation system. The following are a summary of activities provided by Workgroup members.

**TriMet** – Safety is the focus for all of TriMet's operational, planning and strategic decisions. Rather than thinking of it as a single priority—we are renewing our efforts to create a culture where safety is a core value. A safety management system is being implemented to facilitate proactive identification and control of safety risks to provide for safer transit operations for the community it serves. Among the strategies implemented is safety education. TriMet has a Safety Education Advisory Committee composed of community representatives who have a shared interest and stake in promoting safe interactions between bicyclists, pedestrians, drivers and transit users. Members of this group work together on common education efforts and advise TriMet. In addition, our

outreach staff works directly with schools to educate faculty, parents and students on how to behave safely around buses, MAX light rail and WES commuter rail.

**Clackamas County** – Clackamas County completed a Transportation Safety Action Plan (TSAP) in spring 2012 which will be incorporated into its Transportation System Plan update. This will be the first county TSAP in Oregon and has served as a template for the RTSP. The County annually develops a Safety Priority Index System list and has their Traffic Safety Commission review it. The County also has an active Traffic Safety Commission and also has a Safe Communities Program with a goal to reduce injuries and fatalities using a 5E approach.

**Washington County** – Washington County addresses safety issues for all modes of transportation by regularly monitoring its transportation facilities, improving its transportation plans, participating in the activities of a variety of local and regional boards and agencies, and maintaining a robust website. The website promotes topical safety issues such as vegetation removal; construction; back to school; winter weather; new laws; and share the road. Washington County maintains and annually reviews a Safety Priority Index System (SPIS) list. Washington County also participated in ODOT's OASIS (Oregon Adjustable Safety Index System) program which is an all roads SPIS list. Washington County has an active Traffic Safety Campaign Committee whose goal is to facilitate coordination with other agencies to maximize the exposure of safety messages to the public. The County also has multiple staff positions directly working on public safety. (A more detailed listing can be found in Appendix A)

**City of Portland** – The City of Portland dedicates staff and resources to working on engineering and education solutions that impact transportation safety on specific high crash corridors and Portland Police continue to address enforcement along these stretches of roadway. Each year the City identifies high crash locations and reviews them for safety deficiencies. The City hosts an annual Transportation Safety Summit, featuring presentations from transportation industry leaders. City staff conducts Pedestrian/Driver Safety Trainings, including translations as needed and has a partnership with Portland Police Bureau for Crosswalk Enforcement Actions, resulting in citations to drivers, bicyclists and pedestrians that do not follow Oregon law when pedestrians are crossing at marked or unmarked crosswalks. (A more detailed listing can be found in Appendix A.)

**City of Gresham** – The City of Gresham puts a high importance on safety with a number of safety policies, programs and projects. The City's Transportation Advisory Committee provides recommendations for safety policies, programs and projects. City staff track safety data through analysis of annual top 10 crash locations in the city. The analysis is to better understand fatalities and injury accidents, identify crash trends, monitor issues and identify countermeasures for prevention. A City Safety Education Program enhances safety for bicyclists, walkers, transit users and motorists and teaches all to share the road. Other programs and amenities that support bicyclists, walkers and transit users include: bike rack installations, bike helmet distributions creation and distribution of a City Bicycle Guide, and a partnership with Gresham Police for Crosswalk Enforcement Actions, resulting in warnings or citation to drivers, bicyclists and pedestrian that do not follow Oregon crosswalk laws. (A more detailed listing can be found in Appendix A.)

**City of Tigard** – The City of Tigard inputs the state crash data into GIS, and analyzes the data to identify locations that have one or more of the following: a) a high frequency of crashes; b) a high rate of crashes per entering vehicle; c) a high frequency of severe crashes; d) a high rate of severe crashes per entering vehicle; e) high rates of crashes involving pedestrians or bicyclists. The City then performs a more detailed analysis on the crash data and site conditions at these locations to identify if there are any engineering/infrastructure improvements that would reduce these crash rates. This information is considered in selecting upcoming street projects and the data is shared with the City's police department to keep informed of each other's issues.

**City of Beaverton** – The City of Beaverton's Comprehensive Plan Transportation Element includes Goal 6.2.3, "A safe transportation system" and policies and actions to improve traffic safety through engineering, education and enforcement. The City monitors intersection collision history through Washington County and ODOT's safety priority index system. Intersections with high collision rates are given special attention for safety improvements. Also, as ODOT crash reports are provided by the Beaverton Police Department to the Transportation Division, they are reviewed. Reporting of safety issues is available by phone, on-line, and at public meetings. The Beaverton Police Department also monitors crash information for subsequent analysis and potential actions.

## 3.0 SUMMARY OF PORTLAND METRO REGION TRENDS

Roadway safety remains one of the most challenging health issues nationwide. In the US, crashes killed an average of 37,500 people per year between 2007 and 2009. During that same time period in Oregon, there were roughly 42,500 traffic crashes and 1,111 people were killed on the state's transportation system, averaging 370 fatalities annually.

The Portland Metro region, with a population of about 1.4 million, comprises almost 40 percent of the state's population. Between 2007 and 2009, in the Portland Metro region there were more than 18,000 crashes including 159 fatalities and 1,444 crashes resulting in an incapacitating injury. This represents 43% of the state's crashes, 14% of its fatalities, and 36% of its incapacitating injury crashes. To begin better understanding the details behind the crash data in the Portland Metropolitan region, Metro received crash information from the ODOT Crash Analysis and Reporting Unit database beginning in 2007. This dataset includes the geocoded location and detailed data for each crash in the region, and is complemented by Metro's rich datasets of transportation infrastructure, transportation operations, and spatial land use data. The combination of these data sources provides the opportunity for detailed analysis of the safety of the region's transportation system and land use patterns.

It must be noted that Oregon is different from other states in that it collects non-injury crash reports predominantly from citizens involved in the crashes. This impacts the quality of crash reports compared to states that have only law enforcement reporting. However, the available crash data is valuable in identifying urban transportation safety trends for the Portland Metropolitan region.

Metro staff spent 2010 and 2011 working with staff from cities and counties of the Metro region, ODOT, TriMet, and other local safety experts to compile and analyze these data from 2007-09[3]. Further, a huge amount of US and international data is available to document national and international patterns and trends. This information is important to provide context for local data. All of this analysis was compiled into the first State of Safety in the Region report (available at http://www.oregonmetro.gov/regionalmobility ), documenting roadway crash data, patterns, and trends in the Portland Metro area and beyond to inform the pursuit of the region's goal of reducing pedestrian, bicyclist, and vehicle occupant fatalities and serious injuries by 50 percent.

The 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 RTSP. Crashes are broken down by a number of factors contained in the dataset provided by ODOT. This data was combined with Metro's mapping database that includes roadway data, such as geometry, traffic volumes, traffic congestion, transit routes, bicycle routes, sidewalk inventory, and spatial land use data. The combined data set allowed for an analysis of the Portland Metropolitan region's crashes from 2007 – 2009 relative to the following attributes:

- Roadway classification
- Mode
- Month
- Time of day and lighting
- Weather
- Road surface conditions
- Crash type
- Contributing factors
- Driver's age and gender
- Seat belt usage
- Number of traffic lanes
- Roadway congestion
- Geography within the UGB (sub-regions, cities, counties, and ODOT Districts )
- People density (population plus employment)
- Urban Land Institute density of services
- Street block density

The State of Safety in the Region report is broken into sections that cover different aspects of the region's crash patterns. It includes:

> *Section 1 – State, National, and International Trends* –Data from the National Highway Traffic Safety Administration (NHTSA) were compiled and analyzed along with population

[3] There is more than a year of lag time between a calendar year and the availability of the ODOT crash data. Data for 2010 was made available in April 2012, but was not available in time to be added to the State of Safety in the Region report.

data from the US Census to identify trends in national, state, and city crashes. NHTSA summarizes traffic fatality data by state and by major city, including number of fatalities, fatalities per capita and per vehicle-miles travelled (VMT), and by travel mode. Five years of data between 2005 and 2009 were considered for this analysis. International data from the European Union was also compiled for comparison.

*Section 2 – All Crashes* – This section summarizes all crashes occurring in the Portland Metro region. The term "serious crashes" refers to all fatal or incapacitating injury (injury A) crashes.

*Section 3 – Roadway Characteristics of Non-Freeway Crashes* – This section summarizes characteristics of crashes occurring on surface streets in the region.

*Section 4 – Roadway Characteristics of Freeway Crashes* – This section summarizes characteristics of crashes occurring on freeways in the region.

*Section 5 – Pedestrians (Non-Freeway Crashes)* – This section summarizes characteristics of crashes involving pedestrians on surface streets in the region.

*Section 6 – Bicyclists (Non-Freeway Crashes)* – This section summarizes characteristics of crashes involving bicyclists on surface streets in the region.

*Section 7 – Crash Type Detail* – In this section, the four crash types identified as most prevalent are reviewed relative to all crashes in more detail to identify patterns. The information includes crash severity and contributing factors.

*Section 8 – Land Use Analysis* – As part of the State of Safety report, Metro performed a spatial analysis of the crash, traffic, and land use patterns in the region. The purpose of the spatial analysis is to identify trends and patterns in serious crashes as they relate to land use patterns.

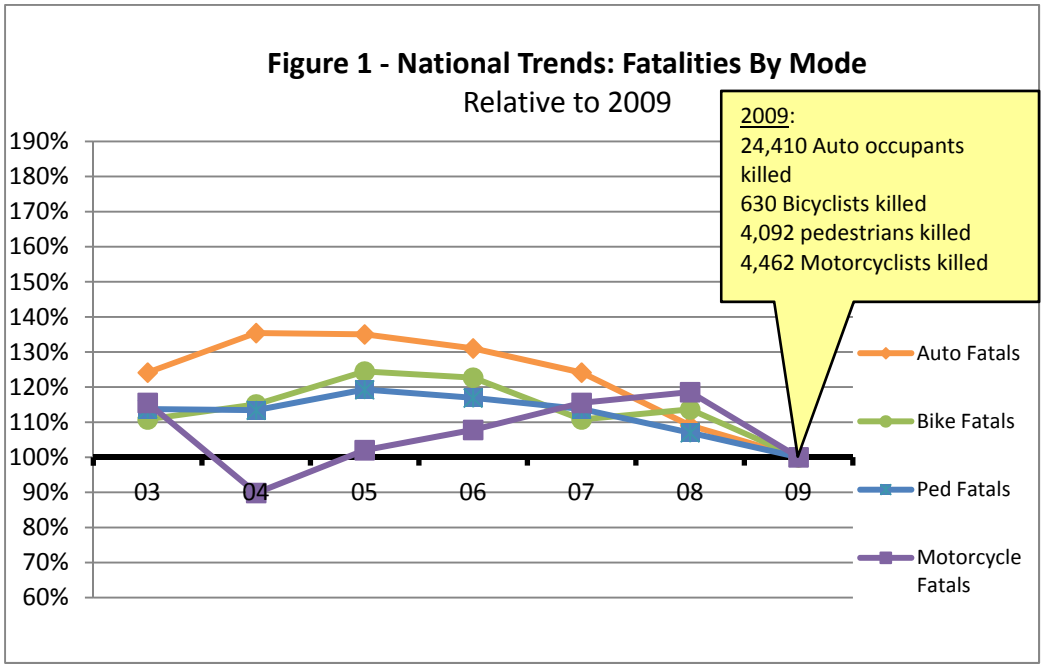
Section 9 – Transit and Rail – This section provides an overview of the crash data available for bus and rail transit and heavy rail in the Portland Metro region.

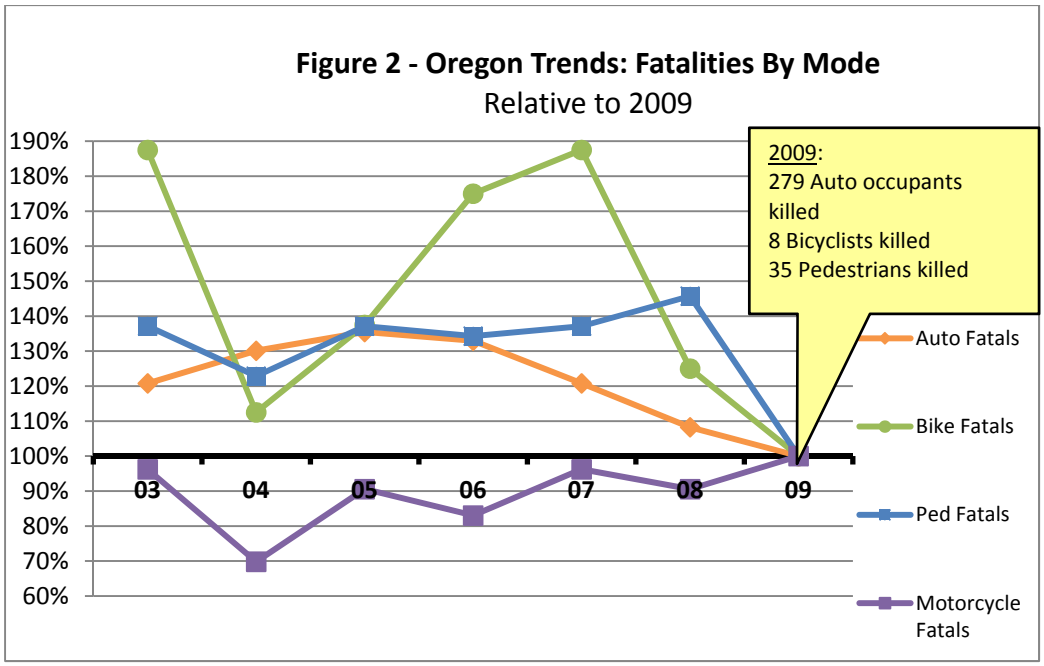
The nine sections of State of Safety report examine the region's crash data through a variety of lenses. The Regional Safety Workgroup has identified the most significant findings from the State of Safety report and grouped them into three categories: all crashes, surface streets and bicycle and pedestrian. Not all sections of the report yielded significant findings, as the land use analysis was inconclusive. Additionally, though the transit and rail data sources were limited when compared to the ODOT crash data, transit by passenger mile experiences less fatalities and serious injuries compared to motor vehicle travel. The following represent high-level findings, focusing on trends that are clearly apparent from the crash data and presented in detail in the State of Safety in the Region report.

## ALL CRASHES

### 1) *Nationally and in Oregon, fatalities are decreasing year-to-year for all modes except motorcycle, which is increasing.*

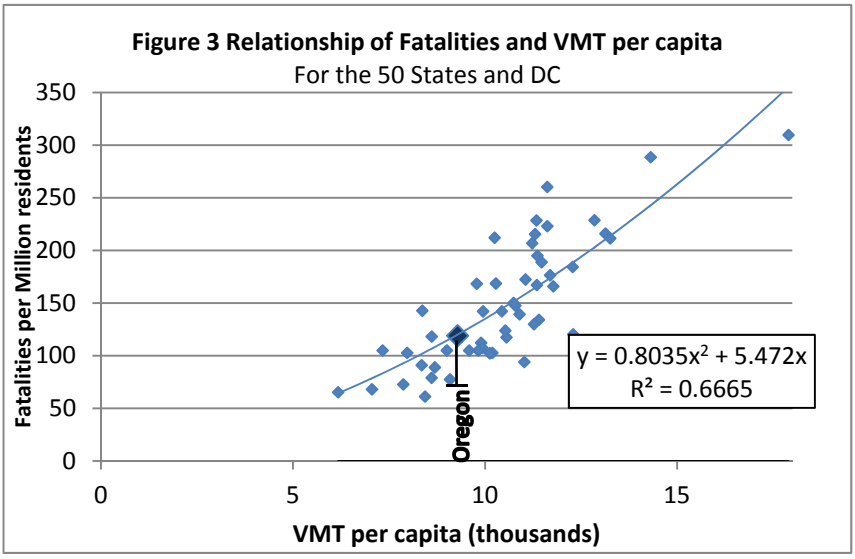
Travel patterns in the US have changed in recent years due to a variety of external factors. While the population has continued to increase, VMT per capita and absolute VMT have declined. Roadway fatality rates have begun to decline after decades of increases or stagnation. In Oregon, these trends are consistent with national patterns. The NHTSA data are broken out by mode: automobile occupants, motorcyclists, bicyclists, and pedestrians. **Figures 1** and **2** show recent national and state trends in fatalities for each mode. Fatalities are decreasing over time for all modes except motorcycle, which are generally increasing.






***2) Increases in vehicle miles travelled (VMT) generally correlate with increases in fatal and serious crashes.***

One of the clearest trends in crash data is the correlation between fatality rates and annual per capita VMT. States with higher VMT typically also have higher per capita fatality rates, as the typical exposure to risk is increased. **Figure 3** shows the relationship by US state for all fatalities.

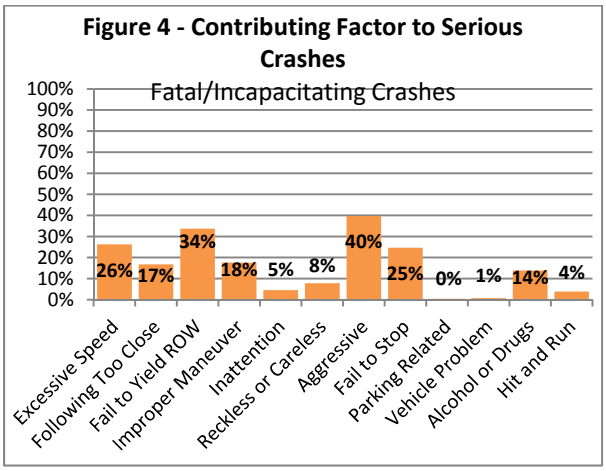


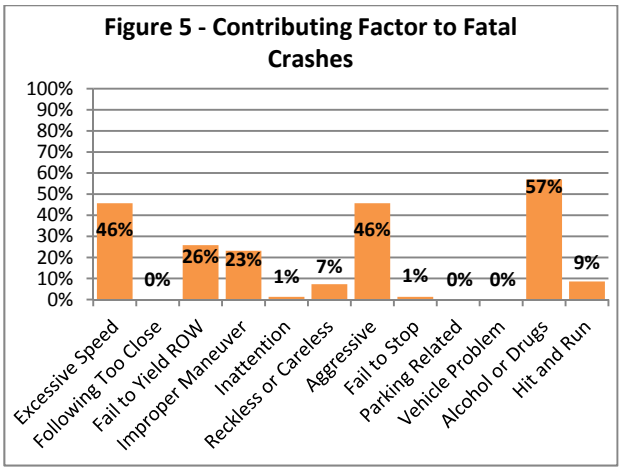

It is apparent from the data that states with more auto travel typically exhibit higher fatality rates. The District of Columbia has the lowest per capita VMT at 6,170, and exhibits one of the lowest annual fatality rates of 65 per million residents – 50% of the national average. Massachusetts, New York, and Rhode Island have the next lowest VMT per capita, and exhibit some of the lowest fatality rates in the US. Wyoming, with the highest per capita VMT of 17,900, also has the highest annual fatality rate at 310 per million residents – 235% of the national average. The national average is 9,920 VMT per capita and 132 fatalities per million residents. Oregon statistics

are 9,280 VMT per capita (94% of the national average) and 119 fatalities per million residents (90% of the national average).

3) ***Alcohol and drugs, excessive speed, and aggressive driving are the most common contributing factors in serious crashes. Crashes involving alcohol and drugs have a much higher likelihood of being fatal than other crashes.***

**Figures 4** and **5** illustrate the percentage of serious injury and fatal crashes by contributing factor. Each crash may have several contributing factors. Alcohol or drugs are a factor in 57% of fatal crashes. Aggressive driving (a combination of excessive speed and following too close) is a factor in 40% of serious crashes.

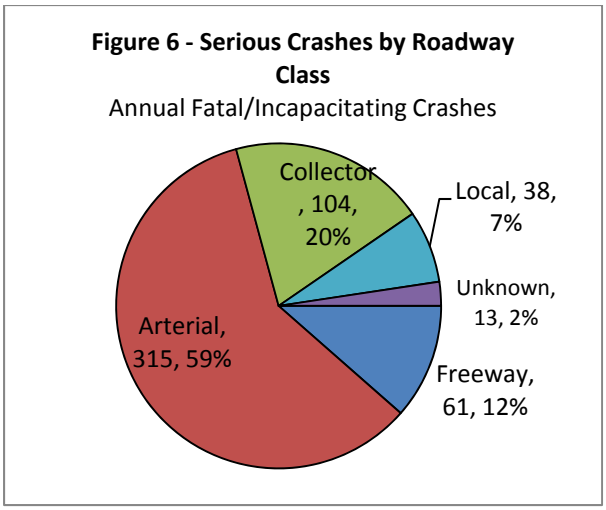



## SURFACE STREETS

4) ***Arterials roadways have the highest serious crash rate per road mile and per VMT. 59% of the region's serious crashes, 67% of the serious pedestrian crashes, and 52% of the serious bike crashes occur on arterial roadways.***

Arterial roadways are the location of the majority of the serious crashes in the region. **Figure 6** sorts all the region's serious crashes by roadway classification. **Figure 7** shows serious crashes per VMT and by roadway classification. Freeways and their ramps are relatively safe, per mile travelled, compared to arterial and collector roadways.



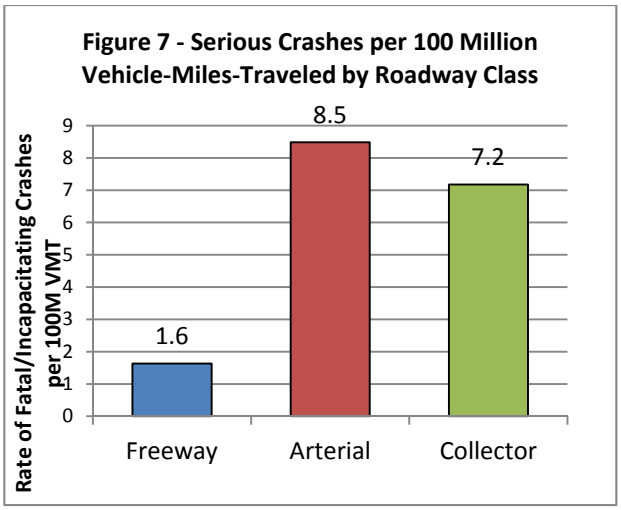
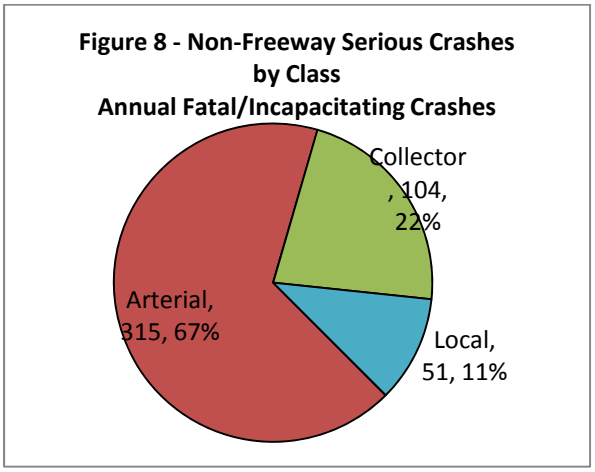
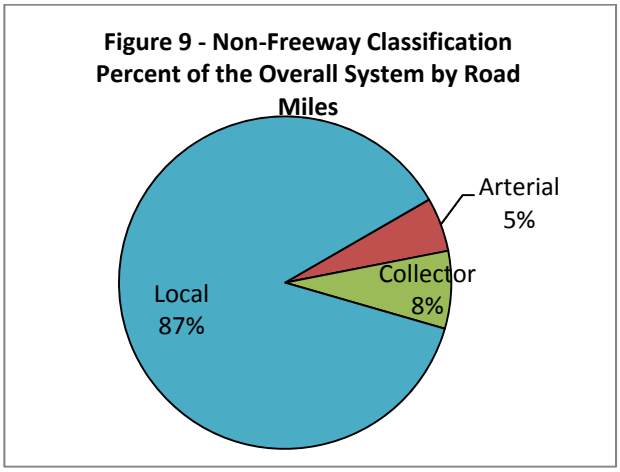



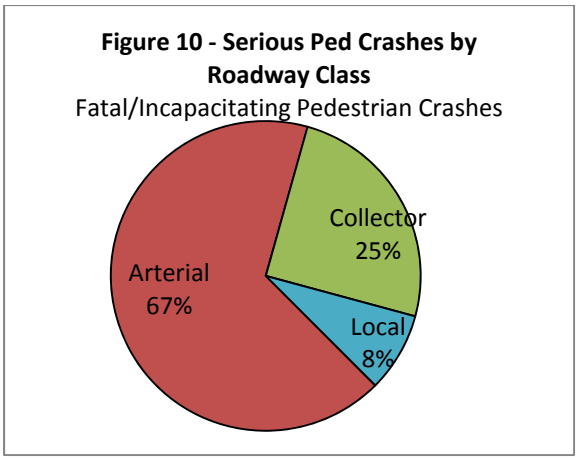

**Figure 8** breaks down the non-freeway serious crashes by roadway classification and **Figure 9** shows the percent by roadway classification of the overall system. Arterial roadways account for 67% of non-freeway crashes, despite making up only 5% of the region's non-freeway road miles.




The majority of pedestrian and bicycle crashes occur on the non-freeway system. Arterials experience a higher number of serious pedestrian and bicycle crashes overall and a higher rate per mile of road than other roadway classifications.

**Figure 10** shows that arterials account for 67% percent of non-freeway serious pedestrian crashes. **Figure 11** shows the serious pedestrian crash rate per mile of road. Although arterials account for only 5% of the overall non-freeway system, their serious pedestrian crash rate per road mile is roughly four times that of collectors and about 125 times that of local streets.



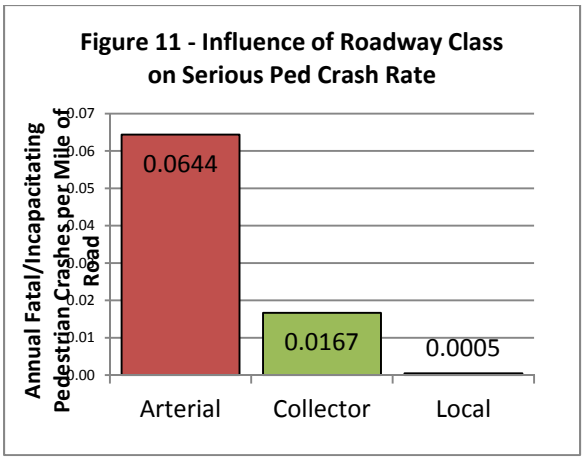
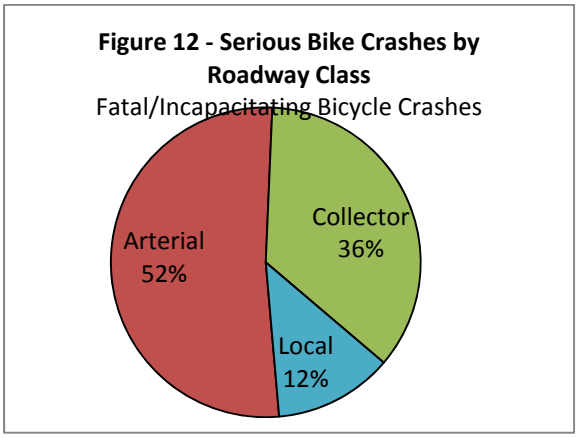
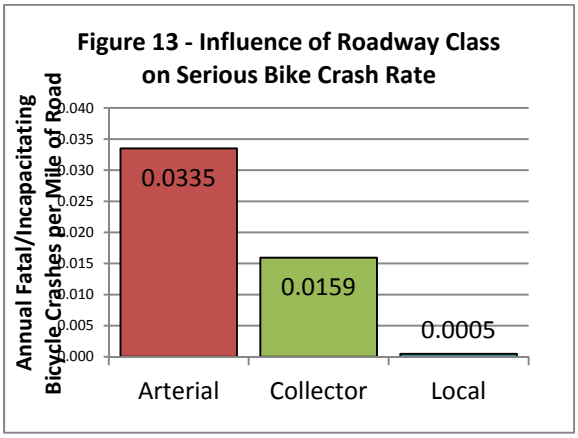



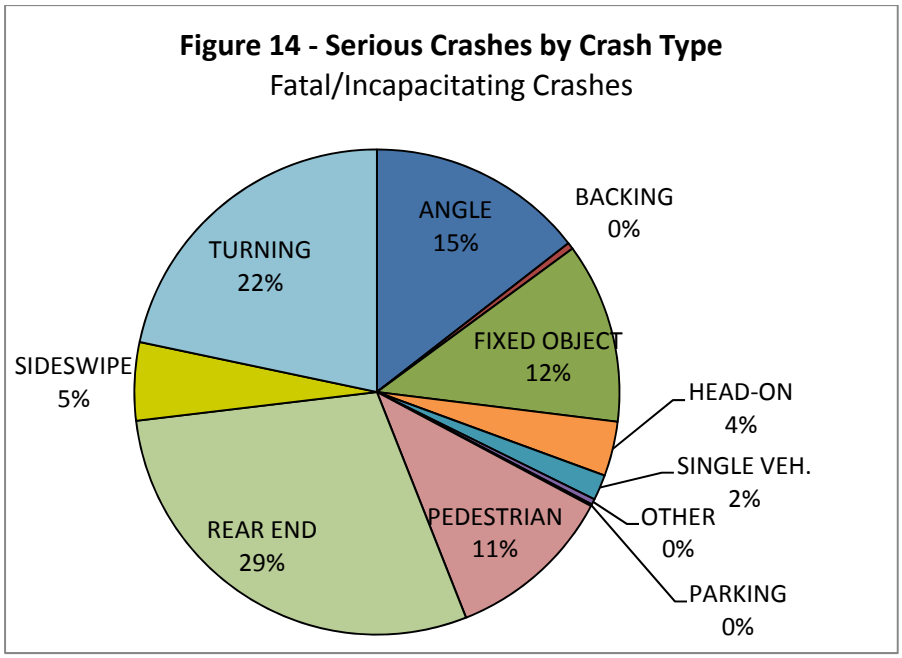

**Figure 12** shows that arterials account for 52% of serious bicycle crashes. **Figure 13** shows the serious bicycle crash rate per mile of road. Although arterials account for only 5% of the overall non-freeway system, their serious bicycle crash rate per road mile is more than twice that of collectors and 67 times that of local streets.

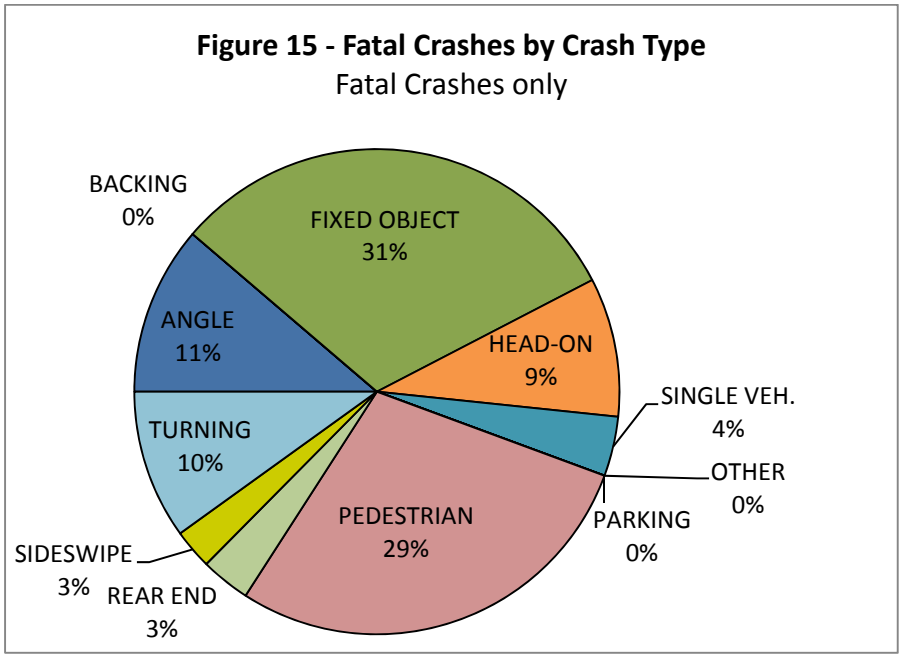



***5) The most common serious crash types on surface streets were rear end and turning. For fatal crashes, the most common types were pedestrian and fixed object.***

**Figures 14** and **15** present serious and fatal crashes by crash type. Fatal crashes are specifically broken out here because the distribution is substantially different. For the purpose of establishing crash type, bicycles are considered vehicles, and so there is no separate bicycle crash type. 29 and 22 percent of all serious crashes are rear end and turning crashes respectively. However, when looking at just fatalities, the predominant crash types change. 31 and 29 percent of all fatalities are fixed object and pedestrian crashes respectively.



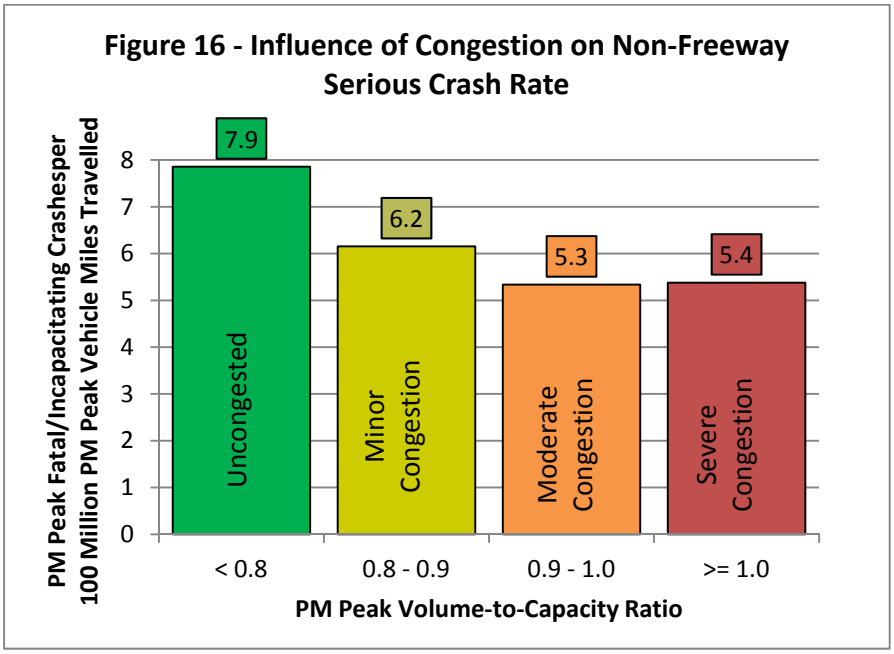




***6) Higher levels of congestion on surface streets are correlated with lower serious crash rates, likely due to lower speeds.***

The combination of traffic data available from the region's travel demand model and crash data allowed for a comparison of traffic congestion with safety. For non-freeways, the analysis included all roadways in the regional travel demand model, including all arterials and collectors, as well as

certain local streets serving a collector function. The intent was to establish the relationship between congestion and safety.

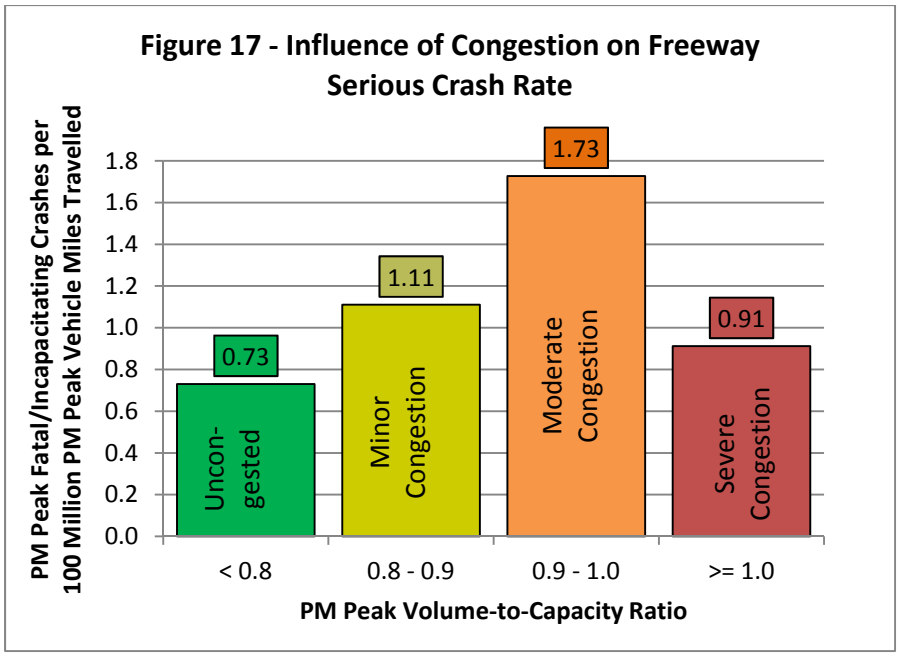
PM peak 3-hour Volume-to-Capacity ratios as determined by the travel demand model were compared to the same 3-hours of weekday crash data. **Figure 16** presents the relationship of serious crash rates and roadway congestion for the region's non-freeway roadways.




The serious crash rate per vehicle-mile travelled is highest for uncongested non-freeway roadways. Non-freeway roadways with higher levels of congestion exhibit lower crash rates.

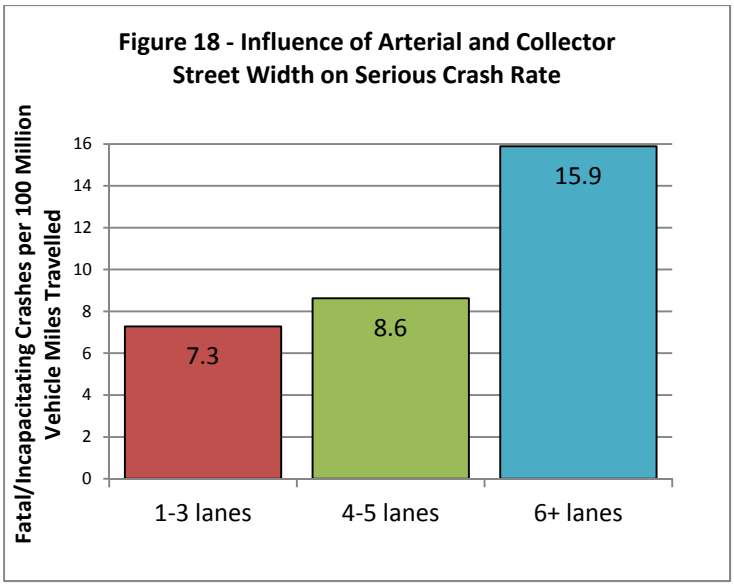
### *7) Higher levels of congestion on freeways are correlated with higher serious crash rates, except for severe congestion, which is correlated with lower serious crash rates.*

For freeways, the analysis of crashes by congestion yielded different results. **Figure 17** shows that serious crashes on freeways increase to a point as congestion increases. However, in severe congestion, the serious crash rate declines. This could be attributed to the speed differentials experienced during congested conditions. As congestion increases on freeways, stop and go conditions and mixes of speeds could contribute to higher crash rates. However, in severely congested conditions the speed of all vehicles is diminished and serious crashes are less frequent.

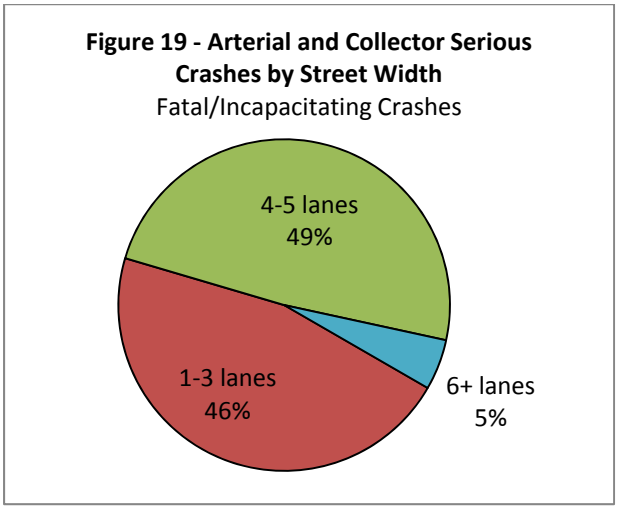


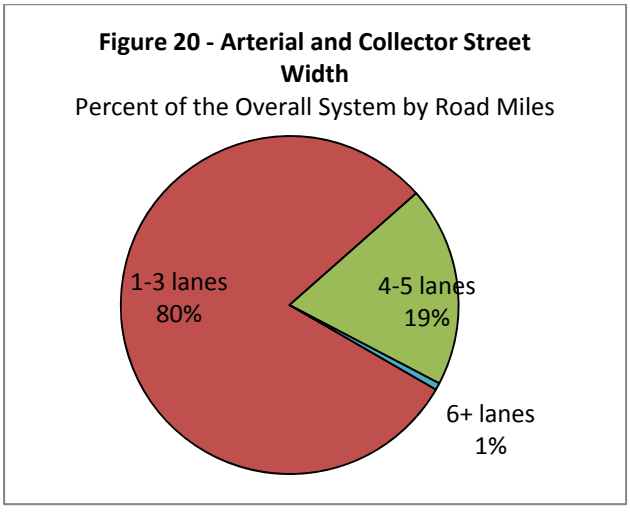

***8) Surface streets with more traffic lanes have higher crash rates per road mile and per VMT. This follows trends documented in AASHTO's Highway Safety Manual. Roadway designs that increase speed lead to increased crash severity in the absence of specific safety considerations.***

**Figure 18** presents the crash rate per traffic volume for the non-freeway system in the region. As the number of traffic lanes increases so does the serious crash rate per VMT. The influence of street width is consistent with the influence of roadway classification. The crash rate increases dramatically for roadways with 6 or more lanes. Similar patterns are documented in AASHTO's Highway Safety Manual (2010), Chapter 12.

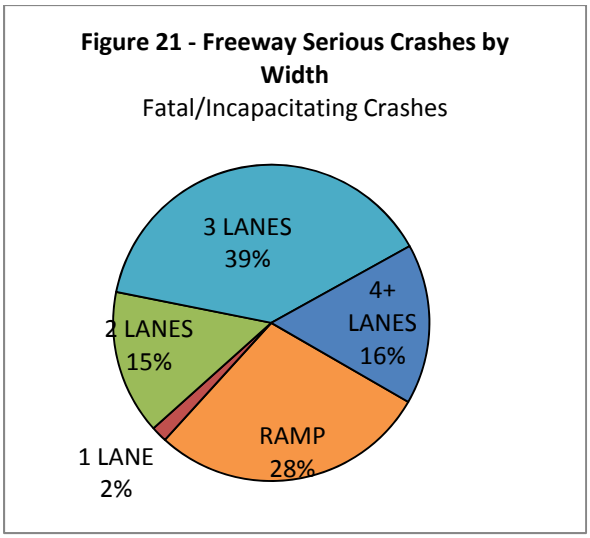


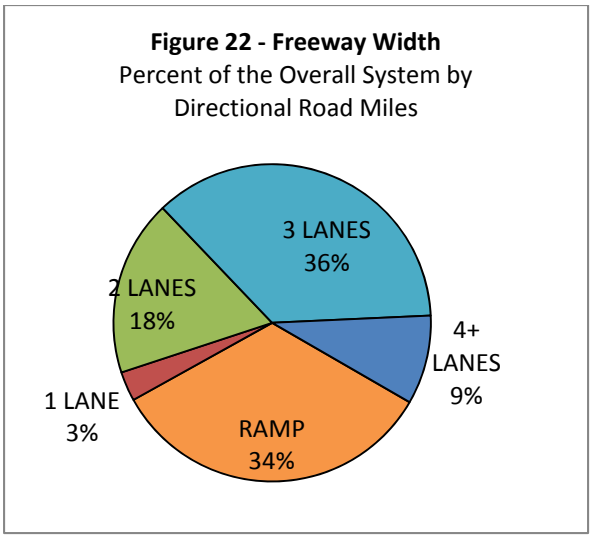

Roadways with more traffic lanes are the location of a disproportionate number of serious crashes in relation to both their share of the overall system and the vehicle-miles travelled they serve. **Figure 19** shows the percent of serious crashes on arterials and collectors by the number of lanes. **Figure 20** displays the percent of arterials and collectors by number of lanes as a percent of the overall system road miles. Four to five lane roadways account for 49 percent of all non-freeway serious crashes, but comprise only 19 percent of the overall system. Six plus lane roadways account for 5 percent of all non-freeway serious crashes, but comprise only 1 percent of the overall system.



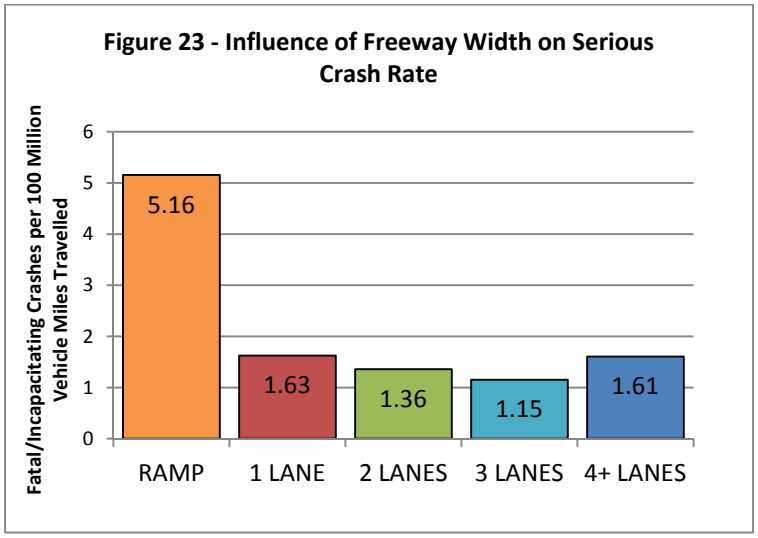




**Figures 21** and **22** present the distribution of freeway crashes by number of lanes. They also present the proportion of freeway crashes that occur on ramps.



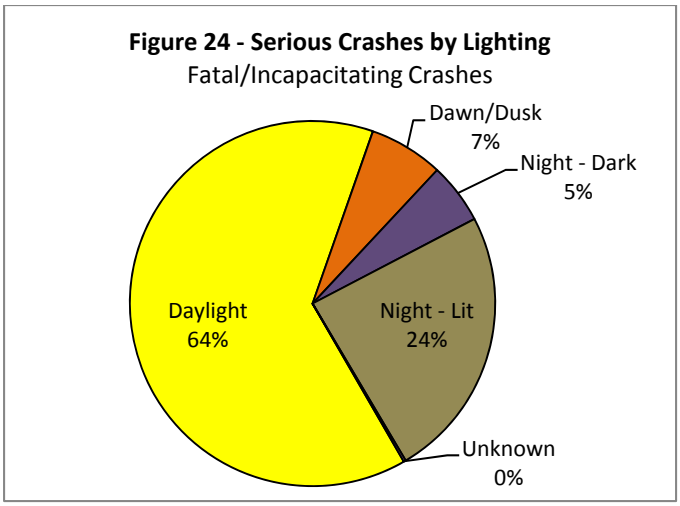

The influence of freeway width is not as pronounced as for non-freeway roadways. Freeways with three directional lanes (including auxiliary lanes) exhibit the lowest crash rates, while the rate increases for freeways with more or fewer lanes (**Figure 23**). Ramps exhibit a higher rate per mile travelled due to slowing of vehicles, merging, and ramp terminal intersections(**Figure 21**).



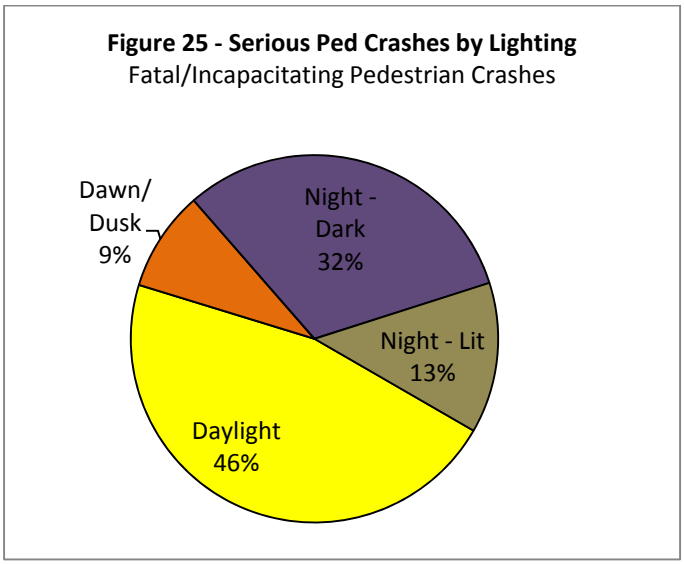

## BICYCLE & PEDESTRIAN

***9) Serious pedestrian crashes are disproportionately represented after dark. Serious nighttime pedestrian and bicycle crashes occur disproportionately where street lighting is not present.***

**Figure 24** shows that almost two-thirds of all serious crashes occur during the day.



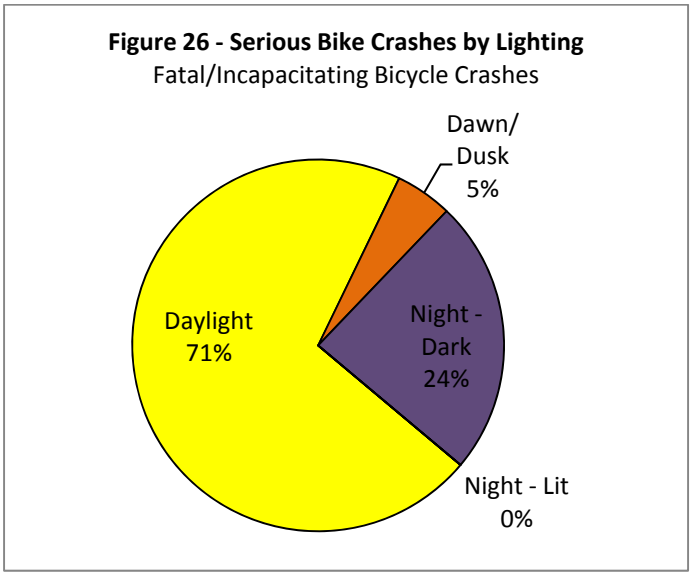

However, when looking at just pedestrians, the number increases to 45 percent of serious crashes occurring at night (**Figure 25**).




### *10) Serious pedestrian and bicycle crashes occur disproportionately where street lighting is not present.*

Street lighting appears to be an important factor for pedestrians and cyclists. **Figure 24** above illustrates that while 29% of crashes occur at night, only 5% happen where street lighting is not present. This means that 17% of all night time crashes happen where street lighting is not present. This is dramatically different when looking at bicyclists and pedestrians. **Figure 25** shows that 45% of serious pedestrian crashes occur at night, but 71% of these nighttime serious crashes happen where lighting is not present. For bicyclists, the nighttime serious crash rate is even higher. **Figure**

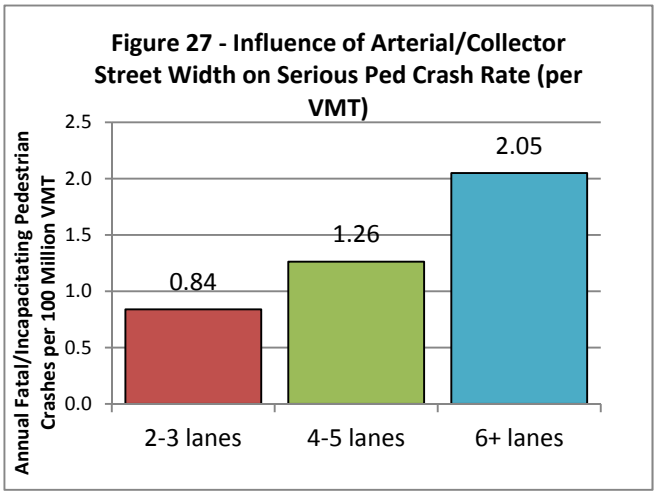
**26** shows that 24 percent of serious bicycle crashes occur at night, but 100% of these crashes happen where lighting is not present.




Lighting appears to be particularly important for the safety of pedestrians and bicyclists.

### *11) Streets with more traffic lanes have higher serious pedestrian crash rates per mile and per VMT.*

As can be seen in **Figure 27**, when normalized by motor vehicle traffic volume, the serious pedestrian crash rate on roadways with more traffic lanes is still substantially higher than on narrower roads. Roadways with more traffic lanes are particularly hazardous to pedestrians. Many transit routes follow these multi-lane roadways, increasing the need for people to cross these roadways safely.




The influence of street width is consistent with the influence of roadway classification for serious pedestrian crashes as seen in **Figure 28**.

**Figure 28 - Serious Ped Crashes by Street Width**

Fatal/Incapacitating Pedestrian Crashes

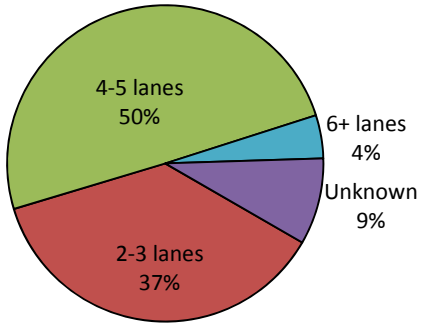
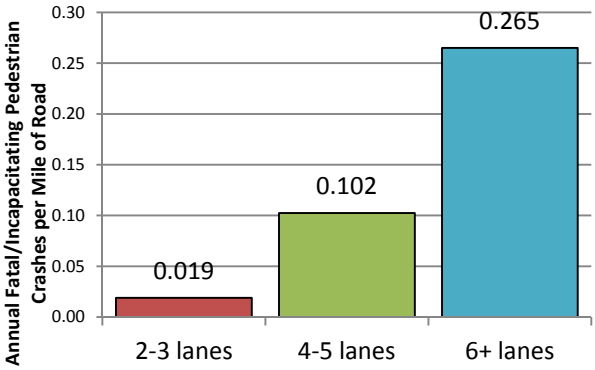



**Figure 29 - Influence of Street Width on Serious Ped Crash Rate**




Wider roadways are the location of a disproportionate number of serious pedestrian crashes in relation to both their share of the overall system (**Figures 28 and 29**) and the vehicle-miles travelled they serve (**Figure 30**). The serious pedestrian crash rate increases dramatically for roadways with four or more lanes, and again for roadways with six or more lanes.

# 4.0 RECOMMENDATIONS

For the Regional Transportation Safety Plan to accomplish the RTP target for reducing fatalities and serious injury crashes by 50 percent, the findings must result in action. There are many partner organizations that share the responsibility of improving safety in Portland Metropolitan region, including federal, state, regional, and local governments and other safety stakeholders. The Regional Safety Workgroup has developed a list of short-term and long-term solutions to help address the findings presented in Section 3 and in the State of Safety in the Region report.

Understanding budget and resource constraints, the Regional Safety Workgroup has highlighted short-term recommendations for the region to pursue in the near future to better address transportation safety and work to reduce fatalities and serious injuries. Longer term recommendations, which are necessary if the region is to achieve the targeted reduction in serious crashes, are also identified for future efforts and policy revisions.

## SHORT-TERM RECOMMENDATIONS

| | Finding | Strategy or Strategies | Actions | 5 E's of Safety | Resources Currently Available? | Involved Agencies | Workgroup Recommendation |
|---|---|---|---|---|---|---|---|
| **All Crashes** | ***Alcohol and drugs, excessive speed, and aggressive driving are the most common contributing factors in serious crashes.. Crashes involving alcohol and drugs have a much higher likelihood of being fatal than other crashes.*** | Policies to reduce the prevalence of speeding and aggressive driving on surface streets and to reduce the prevalence of driving under the influence of intoxicants. | • Convene and/or coordinate targeted workgroup of safety professionals (law enforcement, EMS, etc.) to develop targeted strategies to reduce the prevalence of driving under the influence of alcohol and/or drugs, speeding and aggressive driving. | Education, Enforcement, Engineering, and EMS | No | Possibly Metro | A regionwide workgroup is needed to complement state and local efforts. Metro could lead if grant funds become available. |
| **Surface Streets** | ***Arterials roadways have the highest serious crash rate per road mile and per VMT. 59% of the region's serious crashes, 67% of the serious pedestrian crashes, and 52% of the serious bike crashes occur on arterial roadways.*** | A regional arterial safety program to focus on corridors with large numbers of serious crashes, pedestrian crashes, and bicycle crashes. | • Develop systemic performance measures for identifying high severity crash arterials across the region. Use strategies including Highway Safety Manual strategies to address arterial safety, such as medians, speed management, access management, roundabouts, and road diets. | Engineering and Evaluation | Need GIS and data analysis support. | Metro | Use RTP performance measure to prioritize safety projects in region. Develop a regional arterial safety workgroup to identify tools and strategies. |
| **Bicycle & Pedestrian** | ***Serious pedestrian crashes are disproportionately represented after dark. Serious nighttime pedestrian and bicycle crashes occur disproportionately where street lighting is not present.*** | A focus on crosswalk and intersection lighting where pedestrian and bicycle activity is expected, as well as programs to encourage use of reflective equipment by pedestrians and bicyclists. | • Research pedestrian/bicycle facility lighting best practices.<br>• Ensure bike routes and crosswalks – marked and unmarked – are adequately lit.<br>• Safety education campaign around "See and be seen."<br>• Further explore bicycle and pedestrian safety and identify projects as part of the Regional Active Transportation Plan currently underway. | Education, Engineering, and Evaluation | Yes | Locals, Metro, ODOT | |
| | ***Streets with more traffic lanes have higher serious pedestrian crash rates per mile and per VMT.*** | Policies to improve the quality and frequency of pedestrian crossings on arterials and multi-lane roadways, as well as enforcement of right-of-way at crosswalks. | • Develop safe crosswalks on arterials and multi-lane roads, generally adhering to the region's maximum spacing standard of 530 feet and at all transit stops.<br>• Enforce existing laws through crosswalk enforcement actions. | Education, Engineering, Enforcement, and Evaluation | Yes | Locals, Law enforcement | |
| | ***Streets with more traffic lanes have higher serious bicycle crash rates per mile.*** | Policies to encourage protected bicycle facilities along roadways with high motor vehicle traffic volumes and/or speeds. | • Along high-volume and/or high-speed roadways, where feasible, provide protected bicycle facilities such as buffered bike lanes, cycle tracks, multi-use paths, or low-traffic alternative routes | Education, Engineering and Evaluation | Yes | Locals, Metro, ODOT | Incorporate into Metro design best practices and incorporate into new projects as cost feasible. |

## LONG-TERM RECOMMENDATIONS

| | Finding | Strategy or Strategies | Actions | 5 E's of Safety | Resources Currently Available? | Involved Agencies | Workgroup Recommendation |
|---|---|---|---|---|---|---|---|
| **All Crashes** | ***Increases in vehicle miles travelled (VMT) generally correlate with increases in fatal and serious crashes.*** | Policies that limit the need to drive, and therefore limit vehicle-miles travelled. | • Continued support of regional and state policies that seek to reduce VMT, including multimodal facilities, transit, RTO, and TDM. | Engineering and Education | Yes | Locals, Metro, TriMet, ODOT | |
| **Surface Streets** | ***The most common serious crash types on surface streets were rear end and turning. For fatal crashes, the most common types were pedestrian and fixed object.*** | Develop more detailed understanding of causes of the most common serious crashes in the region and the effectiveness of countermeasures. | • Develop safety best practices based on the HSM for the region to address the most prevalent crash types. | Engineering | No | Locals, Metro, TriMet, ODOT | |
| | | | • Further analyze crash types. | Evaluation and Engineering | No | Metro, ODOT | |
| | ***Higher levels of congestion on surface streets are correlated with lower serious crash rates, likely due to lower speeds.*** | Revisions to state, regional, and local mobility standards to consider safety as equally important, at a minimum, as vehicular capacity. | • Elevate safety to equal importance as mobility in regional policy as part of the next RTP update that will start in 2013. | Education and Evaluation | Yes | Locals, Metro, ODOT | |
| | ***Higher levels of congestion on freeways are correlated with higher serious crash rates, except for severe congestion, which is correlated with lower serious crash rates.*** | Revisions to state, regional, and local mobility standards to consider safety as equally important, at a minimum, as vehicular capacity. | • Elevate safety to equal importance as mobility in regional policy as part of the next RTP update that will start in 2013. | Education and Evaluation | Yes | Locals, Metro, ODOT | |
| | ***Surface streets with more traffic lanes have higher crash rates per road mile and per VMT. This follows trends documented in AASHTO's Highway Safety Manual.*** **Roadway designs that increase speed lead to increased crash severity in the absence of specific safety considerations.** | A regional arterial safety program to focus on corridors with large numbers of serious crashes, pedestrian crashes, and bicycle crashes. | • Include safety as an element of the update to the Metro Best Design Practices guidebooks.<br>• Use strategies including Highway Safety Manual strategies to address safety on multi-lane roadways, such as medians, speed management, access management, improved pedestrian crossings, roundabouts, and road diets. | Engineering and Education | Yes | Locals, Metro, ODOT | |
| **Data** | ***This report identifies high-level trends in regional crashes, but more detailed work is needed to identify specifically where and why they are occurring in disproportionate amounts.*** | More detailed analysis of the causes of serious crashes, pedestrian crashes, and bicycle crashes in the region | • Collect, maintain and analyze ODOT crash data.<br>• Provide regional crash data for use in TSP updates and other requests. | Evaluation | Yes, except for GIS support and data analysis | Metro | |
| **Additional Research** | ***The analysis of the relationship between land use, neighborhood design, and safety was inconclusive. More research is needed to establish reliable relationships between land use, neighborhood design, and safety.*** | More detailed research on the relationship between land use patterns and safety | • Work with OTREC to develop research project to further explore the linkage between transportation safety, land use and the built environment. | Evaluation | No | | |

## APPENDIX A - ADDITIONAL LOCAL GOVERNMENT SAFETY ACTIONS AND PROGRAMS

The following are a more detailed listing of the summary of activities provided in Section 2.0 Local Agencies.

Washington County - Washington County addresses safety issues for all modes of transportation by regularly monitoring its transportation facilities, improving its transportation plans, participating in the activities of a variety of local and regional boards and agencies, and maintaining a robust website. The website promotes topical safety issues such as vegetation removal; construction; back to school; winter weather; new laws; and share the road. Washington County maintains and annually reviews a Safety Priority Index System (SPIS) list to identify intersections with a history of moving up on the list. Washington County also participated in ODOT's OASIS (Oregon Adjustable Safety Index System) program which is an all roads SPIS list.

Washington County has an active Traffic Safety Campaign Committee whose goal is to facilitate coordination with other agencies to maximize the exposure of safety messages to the public. Complementary county policies aim to improve safety, including: (1) a midblock crossing policy to facilitate trail development; (2) a "Minor Betterment" program which funds the construction of safety improvements including sidewalk fill-ins and ADA ramps; and (3) an "access spacing standards" policy which is considered during project development review and in Capital Improvement Program projects.

Several Washington County employees perform tasks directly targeting public safety, including: (1) a bicycle/pedestrian specialist who prepares policy, provides planning, design, maintenance and operations guidance, and acts as a facilitator with bicycle/pedestrian advocacy groups, other agencies and other departments within the county; (2) a school safety coordinator who oversees the Safe Routes To School program who also works closely with local school districts, transportation safety personnel to assist with improving the safety of school walk routes and increasing the numbers of kids walking and biking to school; and (3) a neighborhood streets program coordinator who coordinates the installation of traffic calming devices including speed display reader boards.

Finally, in addition to the above, Washington County monitors the crashes at intersections where a flashing yellow arrow has been installed and has implemented at some of these intersections "pedestrian friendly logic" which eliminates the FYA/pedestrian conflict at intersections running on the latest controller hardware; participates in ODOT's Tripcheck local entry program; and worked with the Commission for the Blind to install audible pedestrian signal equipment at some intersections.

City of Portland – The City of Portland conducts the following safety-related actions:

1) Dedicated staff and resources to implementing engineering, education, and enforcement along designated high crash corridors. Portland Transportation has multiple staff members working on engineering and education solutions that impact transportation safety on specific corridors and Portland Police continue to address enforcement along these stretches of roadway.

2) Annual Transportation Safety Summit, featuring presentations from transportation industry leaders. Over 200 people typically participate in the Summit and enjoy opportunities to visit transportation related vendors, share information, discuss safety issues, and network with others. This year's Summit will be held on March 13, 2012.

3) Pedestrian/Driver Safety Trainings, including translations as needed

- Portland Walks Be Safe! training to learn how to continue to make Portland a GREAT place to walk, drive and take transit.
- Every Corner Is A Crosswalk training to learn Oregon crosswalk laws for drivers and pedestrians.
- Trauma Nurse Talk Tough "Young Driver" presentations.
- Active Living for Older Adults the StreetSmart Way Pilot Program to share ideas and develop a pedestrian safety education/encouragement program for adults 60+ in the community.
- Beacon Buddies training to learn what Rapid Flash Beacons are and how to use/respond to them as a pedestrian and as a driver.
- Development of “Mr. Sharrows” bicycle and driver training about sharrow pavement markings.

4) Partnership with Portland Police Bureau for Crosswalk Enforcement Actions, resulting in citations to drivers, bicyclists and pedestrians that do not follow Oregon law when pedestrians are crossing at marked or unmarked crosswalks.

5) Over-the-Street Banners and billboards installed on high crash corridors with rotating safety messages.

6) Safe Routes to School Program to improve walking and bicyclist routes to school and safer auto circulation around the school.

7) Neighborhood Greenways Program to increase the network of residential streets that connect schools, parks, and provide access to business and transit.

8) Pedestrian Fatality Research Project (Tri-Met, PBOT, ODOT) to better understand pedestrian fatalities, identify crash trends, identify countermeasures for prevention.

9) Other Regional Partner Efforts

- “Share the Road” Bicycle-Pedestrian-Motorist Safety Class offered by Multnomah County Circuit Courts, Legacy Emanuel Hospital and Portland Police to increase education of and compliance with Oregon law that applies to motorists, pedestrians and bicyclists who share our roadways. The goal is to reduce preventable crashes which cause property damage, injury and death to the citizens of our community.
- ACTS Oregon provides car seat check clinics, distributes car seats and booster seats to low-income families and present assemblies at public schools in coordination with Safe Routes

to Schools. (This specifically supports State Emphasis Area #7.) **ACTS Oregon staff are interested in participating in the Metro Safety Committee.
- BTA is working on a Vision Zero project.
- Willamette Pedestrian Coalition may have some projects in the works – it would be good to check with them.

City of Gresham – The City of Gresham puts a high importance on safety with a number of safety policies, programs and projects:

1. The City of Gresham has a Transportation Advisory Committee that provides recommendations for safety of policies, programs and projects.
2. Tack safety data through analysis of annual top 10 crash locations in the city through inputs of state accident data into a GIS system. The analysis is to better understand fatalities and injury accidents, identify crash trends, monitor issues and identify countermeasures for prevention. Specific project development relies on a more detailed assessment of accident type and severity.
3. The city's bicycle policies include bike lanes on all arterial streets, buffered bike lanes where feasible, implement NACTO design recommendations where feasible and off-street bike facilities are designed to establish safe and convenient routes separate from auto traffic or bicycles, walking and other non-motorized users.
4. City policy provides for future street connections and logical continuation of the City Street System to ensure safe and convenient pedestrian circulation, and safe and comfortable bicycle network.
5. Implemented Bicycle Action Plan and was awarded a bronze level certificate proclaiming Gresham to be a Bicycle Friendly Community by the League of American Bicyclists in 2010.
6. Provide Safety Education Program to enhance safety for bicyclists, walkers, transit users and motorist and to teach all to share the road. Other programs and amenities that support bicyclist, walkers and transit users include: bike rack installations, bike helmet distributions and bike maps.
7. Partner with Gresham Police for Crosswalk Enforcement Actions, resulting in warnings or citation to drivers, bicyclists and pedestrian that do not follow Oregon Cross Walk Laws.
8. Develop and implement Safe Routes to School Program to implement walking and biking routes to schools and to enhance auto circulation around schools.
9. Provide Neighborhood Traffic Calming and Speedwatch Programs to allow residents to participate in solving neighborhood problems. Such as speed bumps and digital speed advisory signs.
10. Curb Ramp Safety Program works independently from street repair to install and upgrade curb ramps citywide to meet ADA standards. School zones take priority. Other priority areas for ramp construction are identified in pedestrian districts of Rockwood, Downtown Gresham, and Civic Neighborhood.
11. Infill missing sidewalk links project. This includes inventory of missing links and prioritization based on city advocacy group to provide safety criteria.

12. Modify traffic signals to give more time to cross street and meet current ADA standards (from 3.5'/sec. to 4'/sec.)
13. Enhance pedestrian safety by installing Rapid Rectangular Flashing Beacons (RRFB) at mid block crossings.
14. New directional signage provides greater information and directions to provide safe and convenient access for cyclists and pedestrians on designated routes to specific destinations such as libraries, parks, schools, and trails.