

Oregon Highway-Railway Crossing Action Plan 2022 – 2027



Commerce and Compliance Division

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The 2022 Oregon Highway-Railway Action Plan was produced by the Oregon Department of Transportation, Commerce and Compliance Division, Rail Crossing Safety Team

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The sources used to categorize the highway-railway and pathway grade crossings as required by CFR 234.11 (e) (2) are:

- FRA accident and incident reporting.**
- ODOT Rail Crossing Safety System (RCSS).**

The Oregon Department of Transportation would like to thank the 2018 Project Team for their development of the 2019 Plan for which the 2022 Plan is indebted. The [2019 Plan](https://www.oregon.gov/odot/MCT/Rail_Safety/Oregon-Highway-Railroad-Crossing-Safety-Action-Plan.pdf) is available online at: https://www.oregon.gov/odot/MCT/Rail_Safety/Oregon-Highway-Railroad-Crossing-Safety-Action-Plan.pdf

Table of Contents

- Acronyms** 4
- Executive Summary**..... 5
- Introduction**..... 6
 - The Need for a Highway-Railroad Crossing Safety Action Plan 6
- Plan Scope** 7
 - Highway-Railroad Crossing Safety Action Plan Purpose 7
 - Plan Development Process 7
 - Plan Framework..... 8
 - Plan Strategy 8
- Connections to Other State Transportation Plans – Policy Framework** 9
 - Oregon Transportation Plan 9
 - Oregon Highway Plan 9
 - Oregon State Rail Plan 9
 - Transportation Safety Action Plan (TSAP) 10
 - Oregon Freight Plan..... 11
 - Multimodal in Nature 11
- Oregon Freight and Passenger Railroad System** 12
 - Introduction 12
 - Freight Rail System..... 13
 - Passenger Rail System..... 13
 - Oregon Railroad Crossing Environment..... 14
- ODOT, CCD and Regulation** 15
 - State Rail Specific Regulation 15
 - Funding Authority..... 15
 - Rail Crossing Orders..... 17
- Previous Incident Analysis** 18
 - Review of Incidents: 10 year period 18
 - Crossing Incident Trend 19
 - Incident by Traveler Mode..... 20
 - Traveler Behavior..... 20
 - Location 21
 - Railroads..... 22
 - Multiple Incident Locations 23
 - Conclusions from Data Analysis..... 23
- Issues and Opportunities** 24
 - Issues 25
 - Opportunities 31
- Plan Goals** 33
 - Introduction 33
 - Achieving Plan Goals 33

Key Performance Measures	33
Objectives and Strategies	34
Introduction	34
Oregon Department of Transportation, Rail Crossing Safety	34
Measuring and Reporting	36
Tracking Progress	36
Assessing Plan Effectiveness	36
Assess Crossing Incidents	37
Key Performance Measures	37
Plan Reporting Measures	37
Continued Reporting	37
Rail Advisory Committee	37
Legislative Reporting	37
Next Steps	38
CCD Staff	38
Role of Stakeholders	38
Future Updates	38
Inform Other Plans	38
Partnering with ODOT Divisions and Units	39
Partnering with Outside Agencies and Groups	40
Conclusion	41
Rail Advisory Committee	41
Appendix A	42
Oregon Railroads and other Entities with Operating Authority over Public Crossings	42
Appendix B	43
Appendix C	44
Appendix D	46
Railroad Crossing Safety Communication and Outreach Plan	46
Tactics: TBD, but may include:	46
Next Steps	47
Appendix E — Tables	48
Summary of Oregon Railroad Crossing Incidents: 2008-2017	48
Incident Summary	48
Traveler Information	49
Locations	51
Temporal	54
Crossing Characteristics	55
Multiple Incident Locations	58
Map — Number of Public Crossings per Oregon County	60
Map — Railroad Crossing Incident Severity (2008-2017)	61
Appendix F	62

Acronyms

ADT	Average Annual Daily Traffic	ORS	Oregon Revised Statute
BNSF	BNSF Railway Company	OSP	Oregon State Police
CAR	Crash Analysis and Reporting Unit	OSRP	Oregon State Rail Plan
CAV	Connected and Autonomous Vehicles	OTC	Oregon Transportation Commission
CDL	Commercial Driver's License	OTOP	Oregon Transportation Options Plan
CDS	Crash Data System	OTP	Oregon Transportation Plan
CCD	Commerce and Compliance Division	PNWR	Portland & Western Railroad
DMV	Driver and Motor Vehicle Services	RAC	Rail Advisory Committee
FHWA	Federal Highway Administration	RCSS	Rail Crossing Safety System
EMS	Emergency Medical Services	ROW	Right-of-Way
FARS	Fatality Analysis Reporting System	SAP	State Action Plan
FAST	Fixing America's Surface Transportation Act	STB	Surface Transportation Board
FRA	Federal Railroad Administration	STIP	State Transportation Improvement Program
GIS	Geographic Information Systems	T2	Technology Transfer Center
GCPA	Grade Crossing Protection Account	TDD	ODOT Transportation Development Division
HSIP	Highway Safety Improvement Plan	TPAU	Transportation Planning and Analysis Unit
HSR	High Speed Route	TSAP	Transportation Safety Action Plan
KPM	Key Performance Measure	TPOD	Transportation Planning Online Database
MHRR	Mount Hood Railroad	TSD	ODOT Transportation Safety Division
MPH	Miles Per Hour	TSP	Transportation System Plan
MUTCD	Manual on Uniform Traffic Control Devices	UPRR	Union Pacific Railroad
NEPA	National Environmental Protection Act	USC	United States Code
OAR	Oregon Administrative Rule	USDOT	United States Department of Transportation
OFF	Oregon Freight Plan	VMT	Vehicle Miles Traveled
OHP	Oregon Highway Plan	WPRR	Willamette & Pacific Railroad
ODOT	Oregon Department of Transportation		

Executive Summary

Oregon's transportation system is a multimodal and seamless network of roads, trails, sidewalks, bicycle lanes, waterways and railroads. Millions of travelers and Oregon's economy depend on the system each day. Connections and intersections bring different modes together but also create exposure to potentially risky interactions.

To improve safety and maintain an efficient system, the Oregon Department of Transportation (ODOT) relies on a series of policy and implementation plans to make the most strategic and informed decisions possible. The Highway-Railroad Crossing Safety Action Plan (Plan) supports ODOT's mission, refining the vision and goals of the Oregon Transportation Plan and the related modal and topic plans with a series of crossing safety action items. Equally, the Plan supports ODOT's safety goal of zero fatalities or life changing injuries on the transportation system.

The Plan is a cohesive set of strategies for a comprehensive approach to improving railroad crossing safety in Oregon. It provides a framework for all crossing safety efforts rather than prescribing specific solutions at individual crossings. The Plan recognizes Oregon's unique challenges, and through careful consideration of all travelers at crossings, highlights opportunities to improve crossing and overall transportation safety. Based on an investigation of best practices from within and outside of Oregon combined with extensive stakeholder input, the Plan urges innovative and unified approaches to crossing safety.

The Plan is foundationally a data-based plan and offers ODOT Commerce and Compliance Division (CCD) the ability to respond to changing railroad crossing safety needs effectively. Outlined are goals and objective for a multifaceted approach to improving crossing safety by means of engineering, education, enforcement, outreach, training, process improvements and identifying funding needs. No one strategy is more important than others, but together provide a comprehensive approach to improving crossing safety. CCD administers regulatory authority for railroad crossings; however, less than 10% of public railroad crossings are on the ODOT highway system. Consequently, CCD relies on a network of strong partnerships with local road authorities, railroads and other agencies to address safety improvements. The Plan is fundamentally about collaboration between CCD and its partners. It calls CCD to lead the effort for improved railroad crossing safety in Oregon.

Introduction

The Need for a Highway-Railroad Crossing Safety Action Plan

In 2015, Oregon surpassed four million residents; anticipated growth is projected to push the population over 5 million residents by 2040. In line with a nationwide trend, Oregonians increased their usage of the road system and traveled nearly 37 billion miles in 2017, part of increasing trend. As Oregon's population and economy continue to grow, the number of passenger and commercial vehicles, bicycles and pedestrians crossing the railroad system at over 1,800 public at-grade railroad crossings grows as well, creating more potential opportunities for railroad crossing incidents.

ODOT is the state agency responsible for the development, maintenance and operation of the surface transportation system, including a vast network of roadways, sidewalks and multi-use pathways. ODOT is the regulatory body for transportation related rules and is also responsible for driver licensing and training. In close partnership with other state and local agencies, ODOT is committed to its mission to:

Provide a safe and reliable multimodal transportation system that connects people and helps Oregon's communities and economy thrive.

To meet this mission, ODOT has established a series of topic and modal plans to provide a policy and investment framework and provide guidance for investment decisions. The Highway-Railroad Crossing Safety Action Plan is a supporting component of these plans. It provides explicit guidance to improve railroad crossing safety to support ODOT's mission of a safe and efficient transportation network, but is not a policy plan. Rather, it is an action plan to help ODOT achieve greater railroad crossing safety.

The Plan provides a framework for ODOT, through CCD and other divisions, to be a leader in improving railroad crossing safety in Oregon in the face of these growing demands on the transportation system. The Plan outlines a strategic approach for reducing railroad crossing incidents throughout the state.

While the Plan's focus is on public at-grade railroad crossings, transportation system safety is the overall focus and goes beyond railroad crossings. Crossings include pedestrian and bicycle, even when they are not part of a highway or roadway system. The transportation system is an intermodal network supported by multimodal connections and interactions. The Plan recognizes the challenges of this complex system and provides a cohesive and consistent approach to crossing safety. Through careful consideration of all travelers at crossings, the Plan acknowledges these challenges and highlights opportunities to improve crossing and overall transportation safety.

Plan Scope

Section 11401 of the Fixing America's Surface Transportation (Fast) Act required each state to develop a Highway- Railway Grade Crossing Action Plan (SAP). [Title 49 CFR 234.11](#) establishes the minimum requirements for the SAP.

The Plan is short-term (five year) with long-term implications and initiatives. It stresses the importance of connections across units, agencies and stakeholder groups to improve crossing safety in Oregon. The plan also draws from the Highway-Railway Grade Crossing Action Project and Prioritization Practices Guide (FHWA- SA-16-075).

The Plan identifies highway-railway and pathway crossings that have: (1) experienced at least one accident/incident within the previous three years, and (2) experienced more than one accident/incident within the previous five years.

Highway-Railroad Crossing Safety Action Plan Purpose

Railroad crossing safety impacts all Oregonians. Oregon's cities and communities have developed alongside and around the railroad network. This network is part of an international transportation framework that supports Oregon's strong and diverse economy. As Oregon continues to grow in population, Oregonians will travel on the system more. Economic growth can also impact railroad network usage, increasing the exposure at Oregon's at-grade railroad crossings as demand on the system intensifies.

Crossing safety improvement efforts occur across the state. ODOT's Rail Safety and Compliance Section oversees rail safety on Oregon's transportation system. The Rail Safety and Compliance Section is a unit of the larger CCD. Within ODOT, CCD is responsible for selecting crossing warning devices and obligating Federal Highway Administration (FHWA) Section 130 crossing safety funds. ODOT's Driver and Motor Vehicle Services (DMV) is the primary unit for driver license testing and license administration. DMV is responsible for overseeing driver training schools and is supported in driver training by the Transportation Safety Division (TSD) which manages teen driver and motorcycle training programs with grant funds. TSD is also responsible for applying funding resources to programs that modify traveler behavior to eliminate fatalities and serious injuries on Oregon's roadways. Each of these efforts occur in separate programs within ODOT. The Plan seeks to bring all of these efforts together for ODOT to achieve its mission of improved safety at crossings in Oregon.

The Plan provides a framework of short- and long-term strategies targeted to improving safety at and near Oregon's crossings and supports ODOT's safety goal as stated in the 2016 Transportation Safety Action Plan (TSAP) of zero fatalities or life-changing injuries on the transportation system by 2035. This Plan serves as a pivotal connection between ODOT's TSAP, Oregon Highway Plan (OHP) and Oregon State Rail Plan (OSRP). The Plan addresses all modes of travel at crossings and will be implemented by ODOT as well as local road authorities, railroads and other stakeholders.

Plan Development Process

The Plan is Oregon's first Highway-Railroad Crossing Safety Action Plan as required by [Title 49 CFR 234.11](#). The Plan boundaries are between historical incidents and the application of current best practices to prevent highway-railroad crossing incidents. Although "crash" is a widely used term in the transportation sector to refer to collisions or accidents, for the purposes of the Plan, the term "incident" refers to any impact between a highway user and a train or railroad maintenance of way equipment associated with a crossing.

The data analysis is supplemented by review of other states' efforts as well as research around crossing safety best practices. The Plan is built on extensive engagement with ODOT units, outside partners and agencies.

A stakeholder committee of transportation experts and railroad crossing safety practitioners was established early in the Plan development process. This group convened for two extended work sessions to discuss and prioritize factors contributing to crossing incidents, advance Plan objectives, assess current crossing project development processes, develop Plan strategies and provide input on funding prioritization process improvements. Additionally, various ODOT program areas were engaged through the Plan development process, contributing valuable insight to issue analysis, process improvements and other critical issues.

The partnerships developed in the Plan process will serve as a critical foundation to strategic and systematic Plan implementation. The Plan is intended to be short-term; it will be continuously improved and updated every five years by CCD.

Plan Framework

An assessment of issues and opportunities impacting crossing safety served as the basis for Plan goals. This assessment was supported by extensive data analysis of previous crossing incidents, consideration of national and state trends, connections to other state transportation plans and broad outreach to public and private stakeholders. Plan goals provide direction toward specific results. Goals are supported with objectives to provide more specific direction.

The Plan outlines a series of goals and objectives related actions which address various crossing safety issues at Oregon's at-grade railroad crossings. The implementation of these strategies impacts more than just railroad crossings; it affects the entire transportation system and the ability to provide safe connections within and between communities. The success of this Plan relies on a consistent and continuous commitment to implementation with ODOT leading this effort.

Plan Strategy

Plan strategy falls into two general categories. Within each category, specific focus areas are identified as shown below.

1) Addressing Traveler Behavior:

- Education.
- Enforcement.
- Engineering.
- Multimodal Users.
- Multiple Incident Locations.

2) Improving ODOT Coordination and Collaboration:

- Coordination.
- Data Collection.
- Funding.
- Training and Outreach.

Each plan goal is accompanied by specific objectives to implement the Plan. The Plan encourages ODOT to consider all transportation best practices and tailor them to the intermodal nature of crossings as well as the important role each stakeholder plays in crossing safety.

Connections to Other State Transportation Plans Policy Framework

Oregon Transportation Plan

Oregon’s statewide transportation policies, programs and investments are guided by the Oregon Transportation Plan (OTP). The OTP has a 25 year planning horizon and provides a framework of multimodal goals, policies and investment decision-making. It is supported by a series of modal and topic plans. The overarching goal of the OTP is:

A safe, efficient and sustainable transportation system that enhances Oregon’s quality of life and economic vitality.

Modal and topic plans support the OTP with refined policy, system information and specific implementation priorities to address the particular needs of a specific mode or topic. These plans refine and apply OTP policy, guiding state, regional and local investment decisions for parts of the transportation system they address.



Oregon Highway Plan

The Oregon Highway Plan (OHP) is an element of the OTP and the primary plan for the State Highway System. The OHP establishes long-range policies and investment strategies which serve as a decision-making framework for the highway network. It recognizes the multimodal nature of the transportation system and outlines a series of strategies for the efficient management of a safe highway system that is supported by transportation connections and links to land use. The OHP specifically recognizes competing interests for land and the need for efficiency with a series of strategies pertaining to railroad crossings. It emphasizes the importance of crossing closures in conflict reduction as well as the importance of partnerships between public and private entities for crossing safety.

Oregon State Rail Plan

The Oregon State Rail Plan (OSRP) provides policy guidance for the Plan. The OSRP addresses OTP guidance and provides expanded modal policy, goals and strategies to achieve the OSRP vision:

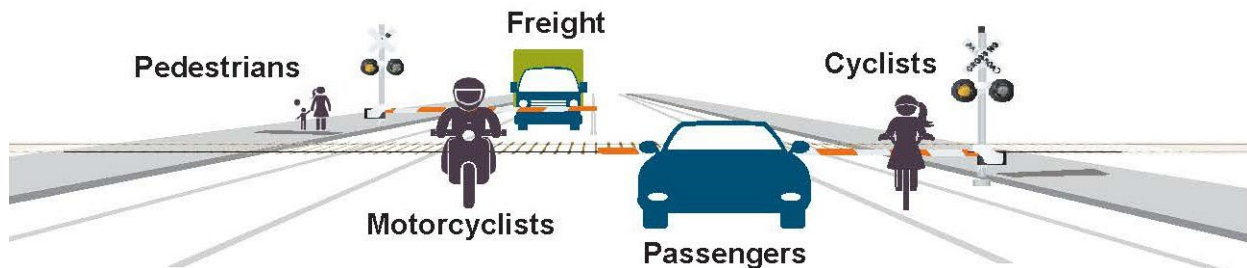
Oregon will have a safe, efficient, and commercially viable rail system that serves its businesses, travelers and communities through private resources leveraged, as needed, by strategic public investments.

The OSRP’s seven goals are:

- Goal 1** – Partnership, Collaboration and Communication. Partner, collaborate and communicate with rail system operators and other stakeholders to maximize benefits, align interests, remove barriers and bring innovative solutions to the rail system; and foster public understanding of rail’s importance.
- Goal 2** – Connected System. Promote, preserve and enhance an efficient rail system that is accessible and integrated with Oregon’s overall multimodal transportation system.
- Goal 3** – System Investments and Preservation. Enhance transportation system reliability, capacity, frequency and travel times through investments that preserve and improve freight and passenger rail assets and infrastructure.

- Goal 4** – Funding, Finance and Investment Principles. Establish funding that meets the critical needs of the rail system in Oregon and achieve the objectives of the State Rail Plan.
- Goal 5** – System Safety. Plan, construct, operate, maintain and coordinate the rail system in Oregon with safety and security for all users and communities as a top priority.
- Goal 6** – Preserving and Enhancing Quality of Life. Increase use and investment in freight and passenger rail systems to conserve and improve Oregon’s environment and community cohesion.
- Goal 7** – Economic Development. Increase opportunity and investment in freight and passenger rail assets to grow Oregon’s economy.

Oregon's transportation system serves the needs of multiple mode users.



Transportation Safety Action Plan (TSAP)

Topic plans support the OTP with policies, needs and implementation priorities for a topic area that often entails more than one mode. Examples include the Oregon Freight Plan (OFP), Oregon Transportation Options Plan (OTOP) and the TSAP, Oregon's strategic highway safety plan.

Crossing improvements are intended to improve the safety of the traveling public and are just one component of the Plan. The Plan outlines a series of strategies that go beyond crossing improvements with a multipronged approach that is foundationally safety oriented. Strategy areas include the 3 E's: engineering, education and enforcement. In addition, there is an expanded set of focus areas that provide broader emphasis including: multimodal users, improved outreach, improved training, stakeholder coordination and funding prioritization enhancement.

The Plan unites the OSRP railroad system goals with the safety goals outlined in the TSAP.

The Plan's success is ultimately measured with reduced fatalities and life changing injuries on the transportation system, specifically as a result of incidents at crossings. The Plan supports ODOT's Transportation Safety Vision as outlined in the TSAP:

The TSAP's six goals are:

- Goal 1** – Improving Safety Culture. Transform public attitudes to recognize that all transportation system users have responsibility for other people's safety in addition to their own safety while using the transportation system. Transform organizational transportation safety culture among employees and agency partners (e.g., state agencies, MPOs, local agencies (Tribes, counties, cities), Oregon Health Authority, stakeholders, and public and private employers) to integrate safety considerations into all responsibilities.
- Goal 2** – Improving Infrastructure. Develop and improve infrastructure to eliminate fatalities and serious injuries for users of all modes.
- Goal 3** – Facilitating Healthy and Livable Communities. Plan, design and implement safe systems; and support enforcement and emergency medical services to improve the safety and livability of communities, including health outcomes.

- Goal 4** – Best Available Technologies. Plan, prepare for, and implement technologies (existing and new) that improve transportation safety for all users, including pilot testing innovative technologies as appropriate.
- Goal 5** – Communication and Collaborating. Create and support a collaborative environment for transportation system providers and public and private stakeholder’s opportunity to work together to eliminate fatalities and serious injury crashes.
- Goal 6** – Strategic Investments. Target safety funding for effective education, enforcement, engineering, and emergency medical services priorities.

Oregon Freight Plan

The purpose of the Oregon Freight Plan (OFP) is to improve freight connections to local, state, tribal, regional, national and international markets with the goal of increasing trade-related jobs and income for Oregon workers and businesses. The OFP is a resource designed to guide freight-related operation, maintenance and investment decisions.

While primarily focused on freight needs and investments for economic purposes, the OFP also highlights the role of transportation system safety in supporting a diverse and robust economy. The OFP specifically highlights the significance of railroad crossing safety in the following issue area and strategy:

Freight Issue: Freight needs to be able to move throughout the state in a manner that is as safe as possible. Its movement may impact safety in Oregon communities and risk to the environment.

Strategy:

- Partner with local, statewide, tribal and federal partners to monitor and manage the safety performance of the statewide freight system.
- Work with the ODOT CCD, Rail Safety and Compliance Section and other programs within state agencies to advance freight issues for consideration in safety plans. This should include continued monitoring of locations on state highways for high incidence of truck-involved crashes to identify any emerging safety issues and continued evaluation of rail grade crossing safety through the Oregon Operation Lifesaver program.

Multimodal in Nature

Railroad crossings are intersections between railroads and various other modes (e.g. auto, bicycle, pedestrian, etc.). They are intended to provide for the safe crossing of roadway users. The complex nature of these multimodal crossings presents many safety challenges. The Plan seeks to address this intricate set of safety needs with a comprehensive approach to crossing safety.

The Plan is multifaceted; it brings together issues affecting crossing safety and provides strategies to address these issues, organized by focus areas. The Plan implements the goals and policies set forth in the OTP and refined in the OSRP, TSAP and OFP. Despite the rail focus of the Plan, it is a multimodal action plan to address safety of all transportation system users at some of Oregon’s most risky intersections-railroad crossings.

Oregon Freight and Passenger Railroad System

Introduction

The railroad system provides the backbone of Oregon's economy; an extensive system that provides connection for the movement of goods and people. The railroad system connects Oregon to the larger nationwide railroad network and to international markets with connections at ports. The railroad system also provides critical mode choice for freight and passenger options, relieving congestion and reducing environmental impacts of the transportation system.

Oregon's railroad system encompasses 1,142 route miles of Class I and 1,245 of short-line railroad route miles. Union Pacific Railroad (UPRR) operates 877.8 miles and BNSF Railway (BNSF) operates 264.4 routes miles.¹ Class I railroads, according to the Surface Transportation Board's 2020 revenue criteria, are those with annual gross revenues exceeding \$504.8 million. Class II, or regional railroads are the second largest railroads, classified as operating at least 350 miles and recording annual revenues exceeding \$40.3 million. Oregon has no Class II railroads. In Oregon, Portland and Western Railroad (PNWR) and Willamette and Pacific Railroad (WPRR) operate as a single Class III railroad. Class III, or short line railroads, are the smallest, generating less than \$40.3 million annually. Oregon has 28 short-line railroads.¹

BNSF and UPRR both access Oregon along the Columbia River corridor. BNSF utilizes the north side of the corridor in Washington and UPRR accesses along the south side of the river. Both railroads traverse the state from northern to southern border. UPRR extends further west through Portland and along the I-5 corridor through the Willamette Valley and east through Hermiston. BNSF routes are east of the Cascade Mountains along the U.S. 97 corridor and south through Klamath Falls, connecting to California.

¹ Oregon Department of Transportation, *the Oregon State Rail Plan (September 2014)* and *Rail and Public Transit Division*.

Freight Rail System

Oregon's railroad system is a critical component of the nationwide, interconnected freight transportation system, providing long-haul and regional connections between Oregon's industries and international markets. Oregon's two Class I railroads together operate 47% of the railroad mileage, carrying the majority of freight traffic. These lines serve as the primary interstate connections. Oregon's regional and short line railroads provide important collector and distributor connections within the state and to Class I lines.

Oregon experienced a small decline in freight shipments for all modes following the 2008 recession but have regained volumes in recent years.

Passenger Rail System

Oregon's railroad system serves a critical function for passenger transportation, offering important modal options through commuter, intercity and long-distance services on the national passenger network. Through agreements with UPRR and BNSF, Amtrak provides service between cities along the west coast and connections to other national destinations. Amtrak offers three routes in Oregon:

- Empire Builder: daily services on long-distance route linking Portland to Chicago.
- Coast Starlight: daily service on long-distance route linking to Seattle, Tacoma, Portland, Sacramento, Oakland and Los Angeles.
- Cascades: frequent daily services between Eugene and Vancouver, British Columbia along a federally designed high speed route (HSR) corridor.

Crossings related to TriMet, Portland Streetcar light rail, Willamette Shore Trolley, and Astoria Riverfront Trolley lines are not included in this plan. Through a freight line system agreement, TriMet's Westside Express Service (WES) provides commuter services in the Portland metropolitan area and important connections to urban public transportation services. Amtrak and WES crossings are included in the Plan.



Oregon Statewide Commodity Flows by Mode

Mode	2011	2016	2045	Change (2016-2045)	2016 Mode Share	2045 Mode Share
Tonnage in Thousands						
Truck	221,046	287,399	388,468	35%	88%	76%
Rail	34,840	21,127	36,184	71%	6%	7%
Water	3,950	6,727	4,967	-26%	2%	1%
Air (including Truck-air)	68	100	308	207%	0%	0%
Multiple Modes and Mail	16,782	11,174	16,552	48%	3%	3%
Pipeline and Other		34,295	62,355	82%	11%	12%
TOTAL	276,686	326,527	508,833	56%	100%	100%

Oregon Railroad Crossing Environment

ODOT authorizes signage at private crossings but currently neither federal nor state funds are available for improvements at private crossings. Although federal Section 130 and state Grade Crossing Protection Account (GCPA) funds may not be utilized at light rail crossings, CCD does work in conjunction with TriMet and Portland Streetcar for at-grade crossing construction and improvements. There are currently no light rail at-grade crossings of a state (ODOT system) roadway. ODOT authorizes safety at public crossings for the traveling public. This authority includes all modes of railroad crossings (i.e. vehicle, pedestrian, bicycle) for nearly 2,400 public crossings. The Crossing Safety Team regulates all at-grade and grade separated railroad-highway crossing activities involving railroads. CCD staff manage crossing compliance, inspections and railroad employee safety.

Total Highway-Railway Public Crossings	2322
Grade Separated	648
At-Grade Crossings (All)	1865
At-Grade Light Rail	92
At-Grade Pedestrian Only (no light-rail)	49

ODOT, CCD and Regulation

State Rail Specific Regulation

Railroad safety decisions are informed by a series of federal and state laws. Federal Railroad Administration (FRA) regulations and standards pertaining to the railroad lines connected to the United States general railroad system are contained in Title 49 CFR Parts 200-299. FRA does not regulate segregated urban railroad transit systems such as TriMet and Portland Streetcar. ODOT is the state agency with regulatory authority to implement FRA regulations. The state of Oregon has also enacted legislation which provides ODOT with exclusive authority over railroad-highway crossings in the state, and has adopted a series of related Oregon Revised Statutes (ORS) and Oregon Administrative Rules (OAR).

ORS 824.200-824.256 — Railroad Crossings

[ORS 824.200](#) through [824.256](#) Provides ODOT the authority to regulate, construct, alter and eliminate railroad crossings. ODOT permission is required to construct new highways across railroad tracks or construct new railroad tracks across highways. It requires ODOT to adopt regulations prescribing specifications to achieve uniform and coordinated regulation of railroad-highway crossings.

ORS 824.204 — Construction of New Grade Crossing and Protective Devices

[ORS 824.204](#) Describes ODOT authority over the construction of new crossings, determine the need for grade crossing separation and authorize type and location of protection (traffic control) devices.

ORS 824.206 — Elimination, Alteration or Closure of Existing Grade Crossing

[ORS 824.206](#) Describes ODOT authority to eliminate, alter or relocate at-grade crossing. This law also provides authority to require installation or alteration of protective devices.

ORS 824.210 — Construction or Alteration of Crossing

[ORS 824.210](#) Describes ODOT authority over the construction or alteration of grade separated railroad crossings.

OAR 741-120-0020 — Grade Crossing Construction and Maintenance

[OAR 741-120-0020](#) Describes the requirements that new and altered grade crossings conform to or exceed nationally recognized standards and provides ODOT compliance authority. This law also sets the requirement that construction of any new driveway within 100 feet of any railroad track at an existing crossing requires a crossing application requesting authority to alter the crossing per ORS 824.206.

OAR 741-200-0050 — Information to Accompany Application

[OAR 741-200-0050](#) Provides specific engineering plan and vehicle traffic signal plan requirements that must be included in the crossing application.

Funding Authority

CCD receives a set amount of federal and state funds annually for crossing safety improvements. The largest source of dedicated crossing safety improvement funds in Oregon is the Federal Aid Crossing Safety Program of Title 23, United States Code, Chapter 1, Section 130 (23 USC § 130), hereinafter referred to as Section 130 Program. These funds are to be utilized for hazard elimination at crossings, typically in the form of warning (traffic control) devices. A non-federal 10% match is required for Section 130 funds.

ODOT is the regulatory and authorized agency for obligation of these funds. To assist with this process, CCD has established a process to evaluate and prioritize crossing needs for funding allocation. The process initiates with crossing evaluation utilizing the risk analysis tool, JAQUA, to create a 200% funding project list. Next, projects are sent to the relevant ODOT region staff for input and coordination with local jurisdictions. Based on additional information obtained, a 150% list is created. Next, CCD Crossing Safety staff completes an on-site diagnostic meeting with stakeholders including local jurisdiction, railroad, FRA, FHWA and ODOT representatives. Finally, the CCD Rail Safety and Compliance Manager considers any other relevant factors to select projects.

- Section 130 (\$3 million).
- Oregon Rail Grade Crossing Protection Account (\$300,000).

Oregon receives approximately \$3.3 million annually for railroad crossing safety. This total has largely remained unchanged for years. Once crossing projects are selected, a diagnostics team completes a needs assessment. Next, the project team develops a project scope including the anticipated budget. Funds are allocated through the State Transportation Improvement Program (STIP) and obligated. ODOT does not require a monetary match from local road authorities but does attempt to leverage Section 130 funds with participation in larger scale projects when appropriate. CCD works with over 24 railroads and over 200 road authorities for statewide crossing safety projects.

Section 130 funds have specific eligibility requirements. Section 130 funds may not be used for construction of new grade crossings or alteration or closure of light rail crossings.

Activities eligible for Section 130 funds include:

- Crossing consolidations.
- Installation of grade separations or repair to existing grade separations.
- Signage.
- Pavement marking.
- Illumination.
- New highway-railroad grade crossing signals.
- Upgraded highway-railroad grade crossing signals or circuits.
- Improved crossing surfaces.
- Traffic signal interconnection/preemption.
- Sight distance or geometric improvements.
- Data improvements (up to 2% of fund apportionment).
- Neither funding source can be used for education.
- Enforcement, outreach, or training efforts.



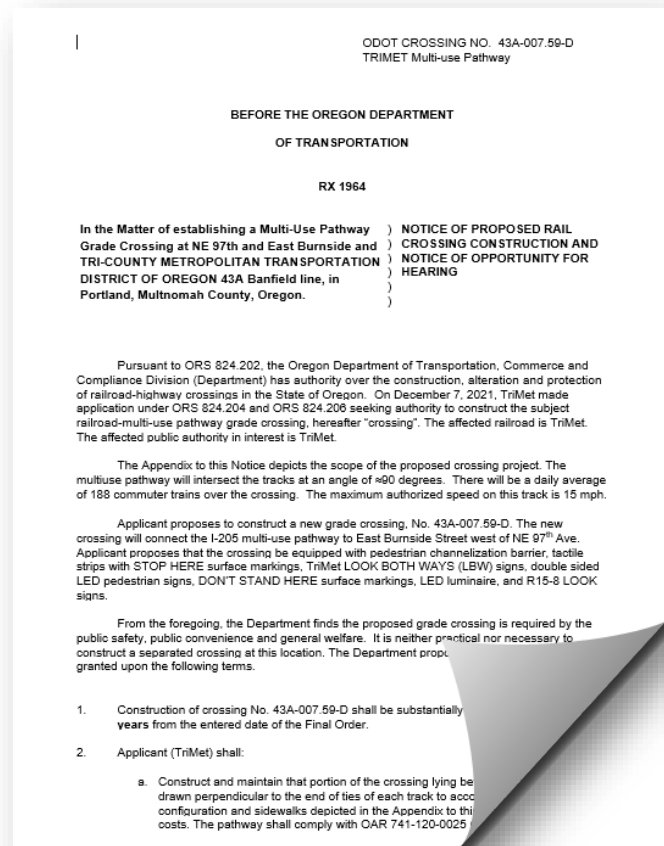
Grade Crossing Protection Account

In 1974, Oregon initiated the rail Grade Crossing Protection Account to eliminate hazards at railroad-highway crossings and to enhance safety at these crossings. GCPA funds are to be expended for railroad-highway crossing safety improvements and include:

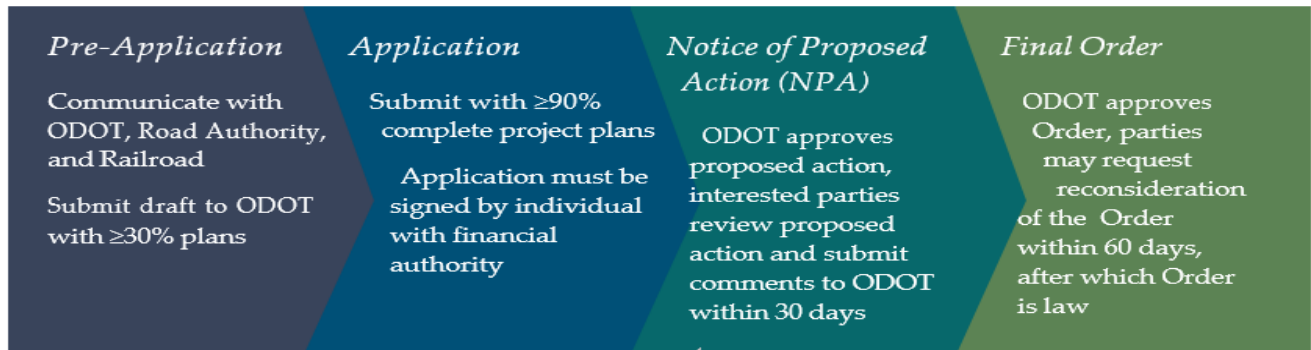
- Acquisition and installation of warning devices.
- Crossing consolidations.
- Installation of grade separations or repair to existing grade separations.

Rail Crossing Orders

In Oregon, crossing orders are essentially laws issued by the CCD Administrator, which specify how crossings are constructed, modified or closed. CCD is responsible for authorizing crossing changes and completing related crossing orders. Crossing orders may be initiated by a local road authority or railroad with an application, or by CCD upon its own determination. A draft review of the application can begin with 30% engineering design plans. The formal application process requires 90% design plans and all parties must agree to the modifications before the process can be completed. After review and final negotiations are complete, CCD will issue the crossing order. Parties may request a reconsideration within 60 days after which the order is law.



Crossing Order Process Summary



*Order process takes about 3 months (more with issue negotiation)
(Administrative hearing process can be initiated if issues cannot be resolved)*

Previous Incident Analysis

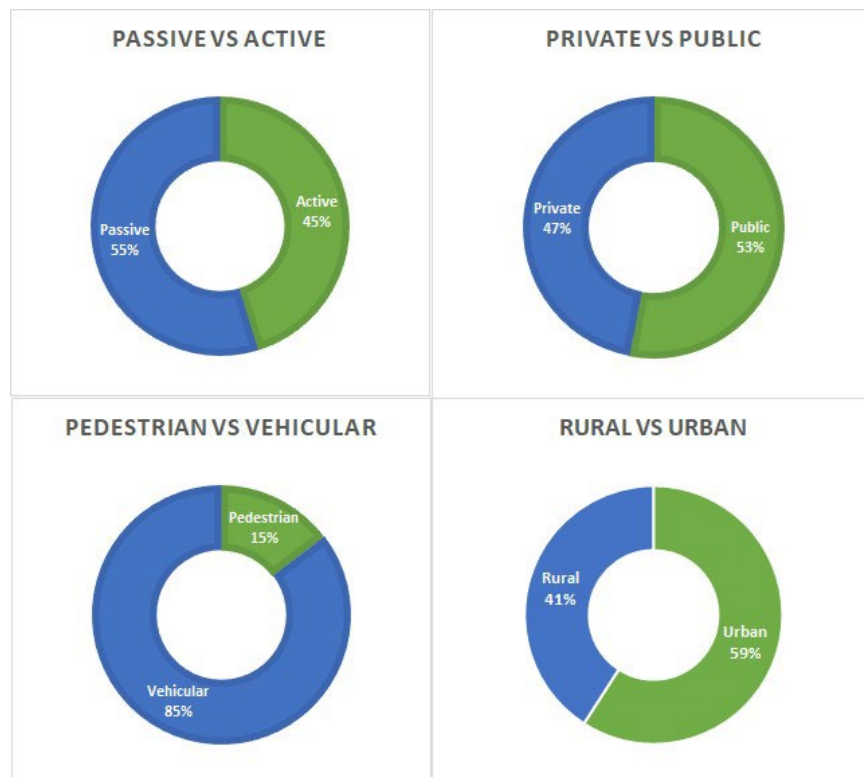
Review of Incidents: 10 year period

Introduction

Data analysis of historical crossing incidents allows the pinpointing of contributing factors to incidents and highlights systematic issues with railroad-highway grade crossings. The incident data has been collected from the FRA database and supplemented with Oregon crash record information from the Crash Data System (CDS) and Fatality Analysis Reporting System (FARS).

FRA defines three categories of at-grade railroad-highway crossings: private, public and pedestrian. TriMet, Portland Streetcar and Willamette Shore Trolley provide light rail and commuter rail service in the Portland metropolitan area. Astoria Riverfront Trolley provides light rail (trolley) service to the Astoria area. CCD does regulate light rail or trolley crossings; However, CCD cannot fund these projects with FHWA or FRA funds. TriMet's WES operates on freight rail lines. CCD does have regulatory authority along this service line and incidents at these crossings. A recent analysis of crossing incidents were examined for 10 years of data (2011-2020). See [Appendix F](#).

**10 Year analyses of crossing incidents
as reported by railroads to the FRA 2011-2020**
Does not include light rail.



Crossing Incident Trend

From 2011 to 2020 the lowest number of annual incidents was six in 2011. The peak total was 19 in 2016 and is part of a trend in rising annual incidents in Oregon. While the overall number of annual crossing incidents is lower than previous decades, incidents are increasing. Oregon's rising crossing incidents follows the national trend and the overall Oregon highway crash trend.

In 1974, Oregon initiated the state GCPA, allocating \$300,000 annually to crossing safety. Following the initial investments, incidents experienced a downward trend with fewer annual incidents recorded in 1977, 1978 and 1979 with a significant reduction in 1980 and forward. The program investments correlated quickly with a reduction in incidents, underscoring the significance of investing in crossing safety improvements. Investment of GCPA and Section 130 funds can only be used for public crossings. In 1986, the Section 130 Program began, resulting in reduced incidents at Oregon's crossings in the following years. While state and federal dollars have contributed greatly to a reduction in crossing incidents, recent funding has remained stagnant and annual incidents have risen in recent years.

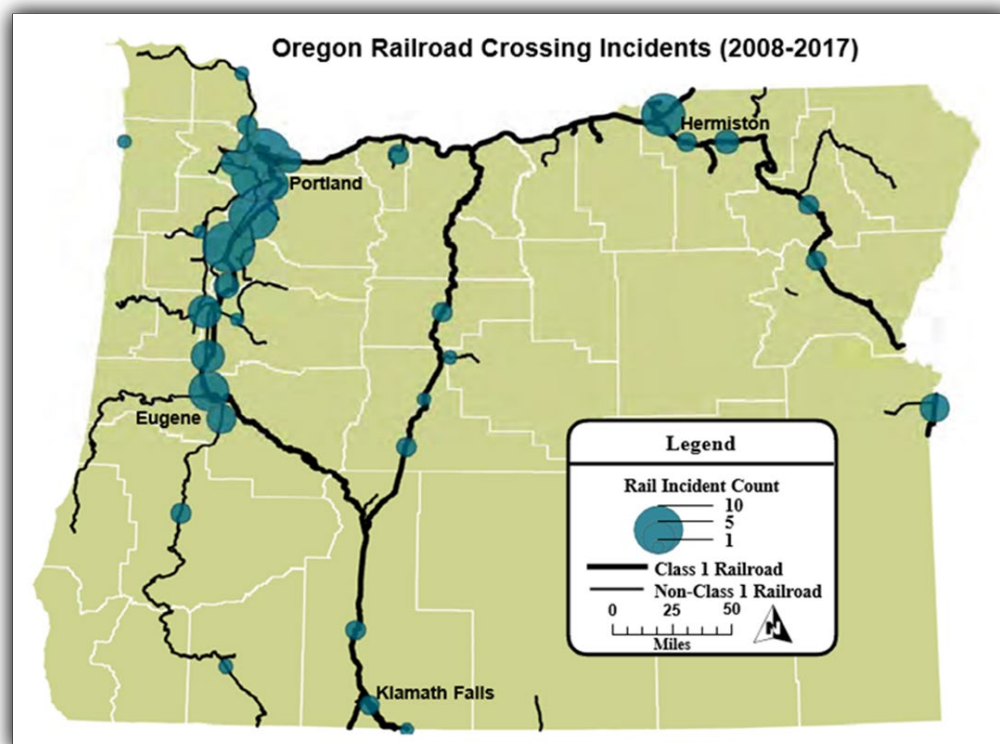
Nationally, vehicle miles traveled (VMT) has risen steadily in the last 20 years and is forecast to continue increasing at an average rate of 1.2% annually.² Oregonians have logged more VMT in recent years. In 2017, Oregon statewide VMT was nearly 37 billion,³ an increase from the previous year and part of a larger trend upward.⁴ The percentage of overall trips by Oregonians on bicycle and walking have increased in recent years as well. While the period 2018-2020 shows a downward trend, this may indicate the public activity decreased due to the COVID pandemic, thereby decreasing the incidents at highway-railway crossings. The Rail Crossing Safety Team will be analyzing data over the Plan years to ascertain trends from public exposure to trains at crossings.

Note: [Appendix C](#) and [D](#) display the recent 3 and 5 year accident / incident as required per [CFR 234.11\(e\)\(1\)\(i,ii\)](#).

² Federal Highway Administration, FHWA Forecasts of Vehicle Miles Traveled (VMT): Spring 2018 (May 2018)

³ Oregon Transportation Safety Division

⁴ Oregon Office of Economic Analysis, Oregon Vehicle Miles Traveled. (March 2017)

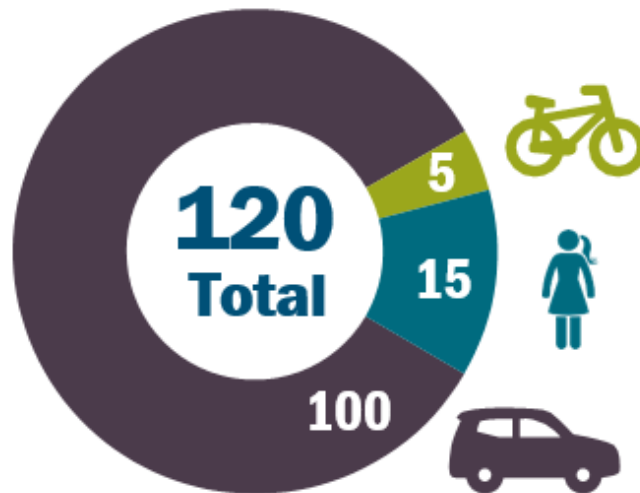


Incident by Traveler Mode

An analysis for the period 2008-2017 found 100 involved a motor vehicle, 18 incidents involved a vehicle that required a commercial driver license (CDL). Five incidents involved a bicycle traveler, three of which resulted in fatality and two resulted in injury. Of those, two incidents occurred at the same crossing that includes an approach via an on-street bicycle lane, four railroad tracks and four travel lanes. Fifteen incidents involved pedestrians with only one incident occurring at a passive crossing. Pedestrians account for 7 of the 20 fatalities resulting from crossing incidents, and 15 of 120 incidents. Given the low volume of pedestrian travel versus automobile travel, it is notable that pedestrian incidents are overrepresented in the Oregon incidents from 2008 to 2017.

Incidents by Mode

18 incidents
involved a vehicle
which required a CDL



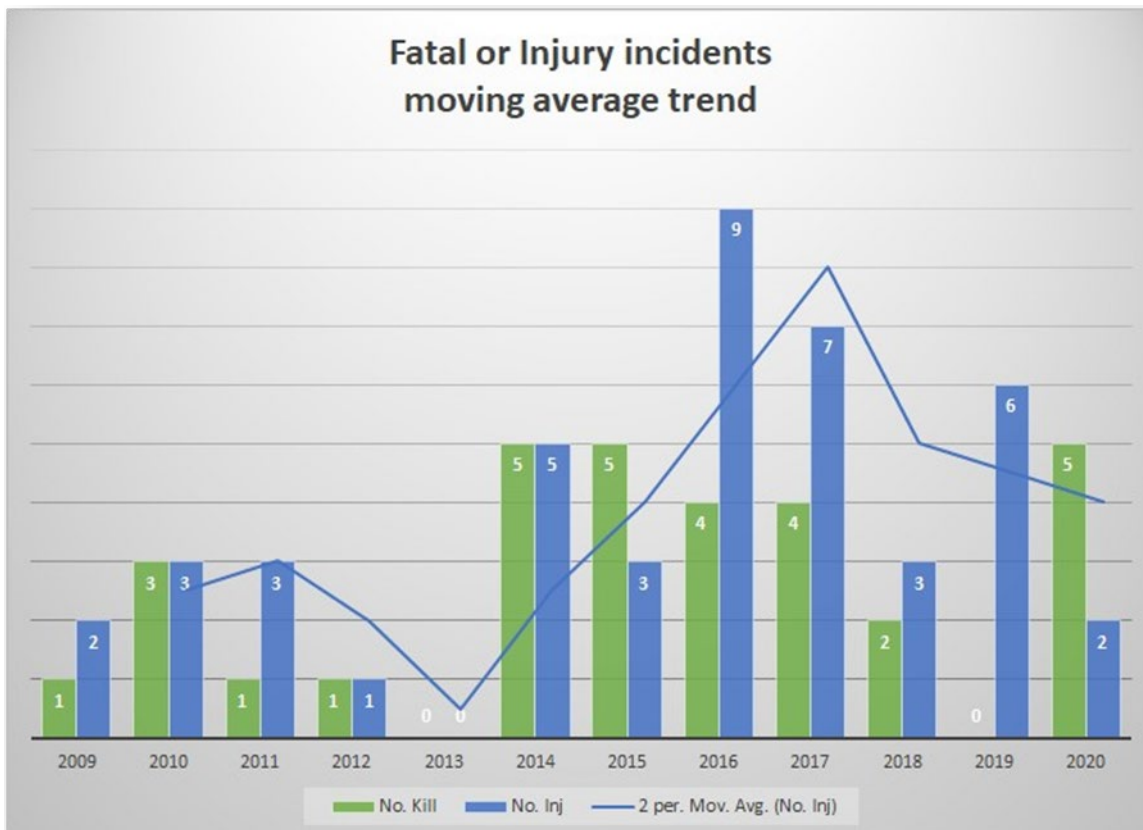
Traveler Behavior

An analysis for the period of 2009-2020 shows that a majority of incidents occurred as a result of poor traveler judgment, risky behavior or distraction. A total of 75 serious (31 fatal, 44 injury) incidents resulted from travelers not stopping, going around activated gates, stopping and proceeding, or stalling or getting stuck on tracks. One incident resulted from a traveler climbing over a train. Another incident occurred as a result of a traveler colliding with a second passing train. One incident occurred at a rural crossing with active devices where a second vehicle followed another around gates in the down position. Two bicycle incidents occurred after the bicyclists went around activated gates and were struck by a second passing train.

Traveler distraction was noted in a handful of incidents, including one incident of a traveler wearing headphones and unable to hear the train. Based on recent traveler trends for all modes, it is anticipated that traveler distraction will be an increasingly common factor in future incidents.

Although queuing was not specifically cited as a contributing factor in the incidents during this period, near-miss reports from this period have indicated that queuing is a growing issue at crossings. No incidents were a result of non-functioning or poor functioning warning devices.

Crossing incidents resulting in injury or fatality 2009-2020



Location

The majority of incidents, 72%, occurred at urban locations, although only 55% of Oregon’s crossings are characterized as urban. A significant number of incidents were found in the

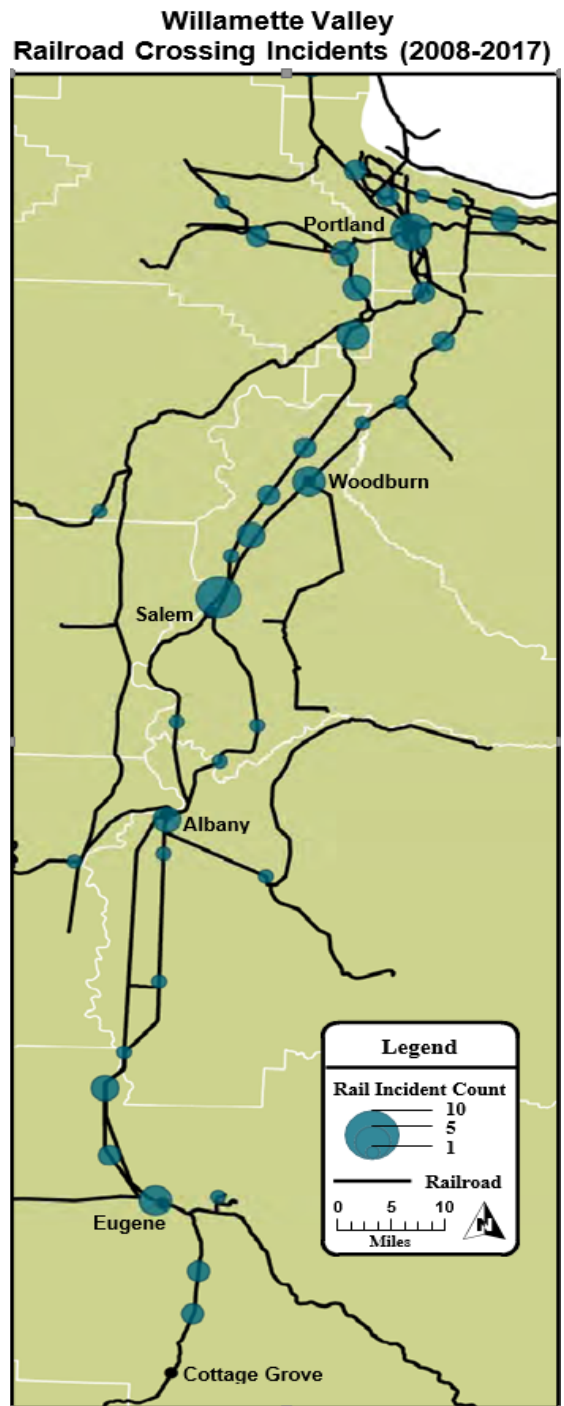
Willamette Valley, specifically the Salem and Eugene metropolitan areas. These are high population areas with a higher than average number of public at-grade crossings. For example, Marion County accounted for 19.2% of crossing incidents but only has 9% of public at-grade crossings in Oregon. Lane and Multnomah Counties each account for 32% of crossing incidents.

Outside of the Willamette Valley, Umatilla County is over-represented with crossings incidents, accounting for 7% of incidents but only 5.5% of total public at-grade crossings. Four separate crossings in Umatilla County had two or more incidents occur at each, which accounts for the higher representation. One crossing has since been closed and safety improvements have been completed at two others.

Railroads

While Oregon has 35 railroads with public at-grade crossings, only nine railroads experienced incidents at crossings from 2008-2017. UPRR has the most route miles and the second highest number of crossings in Oregon. Fifty-eight incidents occurred at UPRR crossings, including 13 Amtrak incidents. PNWR has the second highest amount of route miles and the highest number of crossings but experienced only 38 incidents. UPRR track routes carry the most and longest trains in Oregon. Amtrak operates primarily on UPRR mainline and Amtrak trains were involved in 15 incidents. Although Mount Hood Railroad (MHRR) has a low amount of route miles and a low number of crossings, this railroad experienced a relatively high number of incidents during the study period. Passenger and commuter trains were involved in 22 incidents statewide. Freight trains were involved in 95 incidents and three incidents involved railroad maintenance of way equipment. Roadway travel lanes were assessed as well. It was found that the vast majority of incidents, 71%, occurred at crossings with two travel lanes. Most often, two travel lanes are in bidirectional form. It is notable that two incidents occurred at crossings with nine travel lanes as large crossing intersections present difficult safety challenges.

Finally, the number of train tracks at incident crossing locations was assessed. It was found that most incidents occurred at crossings with one railroad track. Twenty-four, or 20% of incidents occurred at crossings with two railroad tracks and these incidents are overrepresented when compared to the statewide percentage of crossings with two railroad tracks.

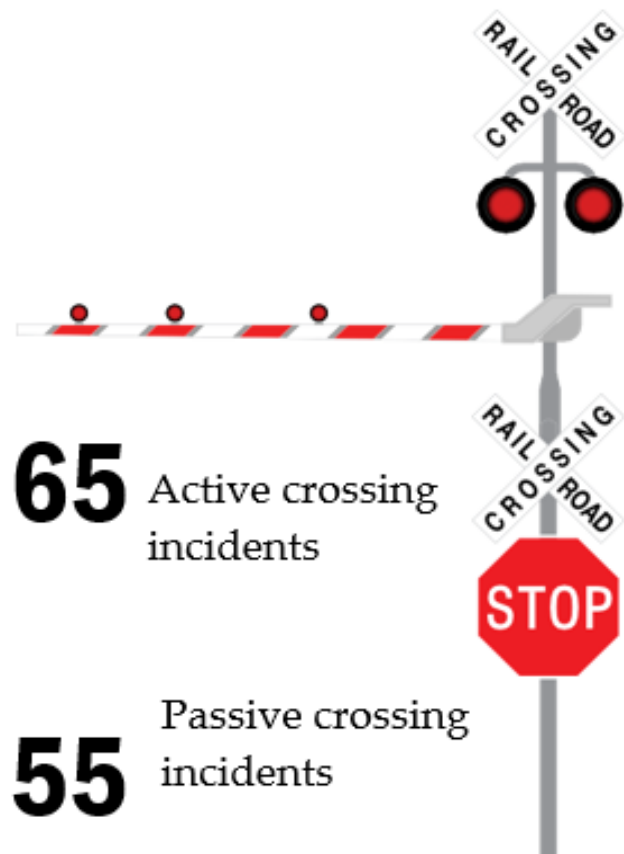


Multiple Incident Locations

During the study period, 39 incidents (33%) occurred at repeat locations. Nineteen crossings had two or more incidents. One location had three incidents and 18 locations had two incidents. A broader study range allowed for better analysis of crossings where multiple incidents have occurred.

Eight fatalities and 13 injuries occurred at multiple incident crossing locations. Over half (10) of the crossings have an intersection angle less than 85 degrees and most (13) have two travel lanes. Further, 10 locations have one track and five have two tracks. Two locations have three tracks and one location has four tracks. One location has since been closed. Twenty-nine incidents at these crossings involved a traveler in a motor vehicle. Eight incidents involved a pedestrian, representing over half of the statewide pedestrian incidents. Two bicycle incidents occurred at the same location.

At the time of the incidents, the majority of multiple incident locations (12) were equipped with passive warning devices. Four locations have been upgraded to active devices, 2 locations have been upgraded with additional devices and 3 locations are scheduled for upgrades. A high number of incidents (19) involved the traveler being stalled or stuck on tracks, compared to 14 who did not stop or stopped and proceeded and six who went around activated gates.



Conclusions from Data Analysis

Over the past 10-year period, Oregon experienced an increase in crossing incidents for all travel modes in recent years. Rising incident rates parallel increases in highway crash and VMT rates. In Oregon, bicyclists and pedestrians together represent a significant number of incidents.

Risky behavior is the most common contributing factor. Equipment malfunction, weather and obstructions rarely contributed to incidents in Oregon during this time. Rather, deliberate crossing safety violations, possibly related to impatience, are a significant factor in crossing incidents. A major number of incidents occurred as a result of going around activated gates and failure to stop at crossings. Many incidents occurred during weekdays, near lunchtime and during the most popular travel times.

Male travelers, particularly below the age of 45 were involved in a majority of incidents. In fact, the younger the traveler, the higher the risk. Nearly half of all incidents involved a traveler younger than 40 years, slightly higher than the national average.

Most incidents occurred in Oregon's high population centers along the Willamette Valley while Umatilla County was an outlier with a high number of incidents. Umatilla County, located in eastern Oregon, is primarily rural in nature.

Given the high number of incidents resulting from stalls and being stuck on tracks, queuing is a potential factor, as is severe roadway approach. Moreover, a significant number of incidents (18) involved a truck or similar vehicle that requires a CDL, further indicating driver training should be further investigated. Intersection angle is also a potential factor as most incidents occurred at locations with a

severe angle. Road speed and train speed may be potential contributing factors. A significant number of crossing incidents occurred on roadways with low Average Annual Daily Traffic counts (AADTs), moderate road speed and low train speed, indicating that travelers misjudge the proximity and danger of an approaching train. Engineering solutions alone are inadequate in addressing contributing factors to incidents in Oregon. A multi-pronged approach including driver education, effective outreach and enforcement is needed to reduce crossing incidents statewide.

Issues and Opportunities

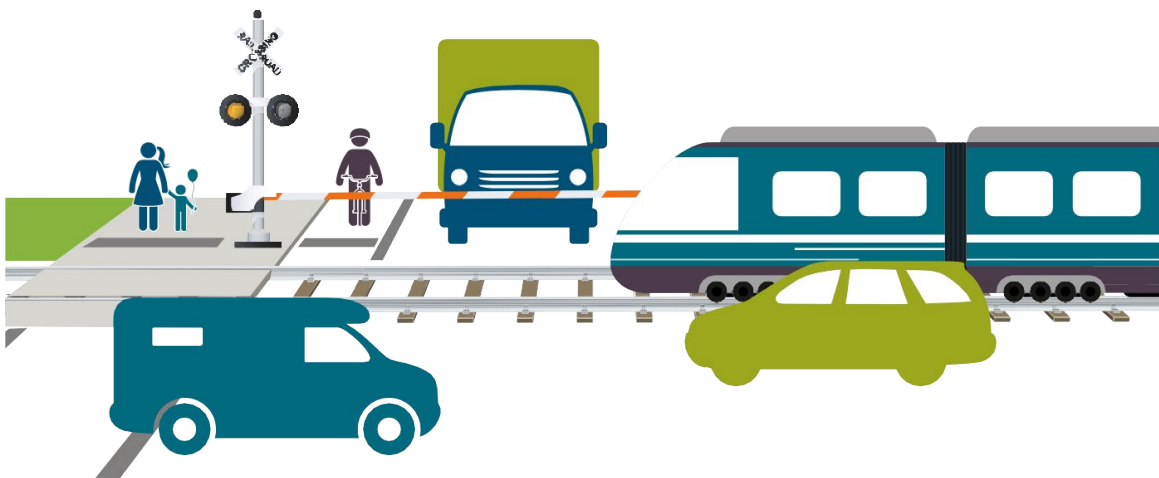
The following is a synthesis of crossing incident analysis, stakeholder input, trends assessment, research and literature review regarding transportation safety, grouped into 17 issues and opportunities. Issues and opportunities inform the Plan objectives and strategies that follow.

Issues

- Risky Traveler Behavior and Poor Judgment at Crossings.
- Incident Location.
- Behavior and Demographic Trends.
- Competing Priorities.
- System Impacts.
- Data Sharing.
- Land Use Impacts.
- Coordination.
- Working with Railroads.
- Route Importance.
- Funding.

Opportunities

- Collaboration with ODOT Partners
- Outside Partnerships.
- Training.
- Analysis Tools.
- Emerging Technology.
- Collaboration with Railroads.



Issues

Risky Traveler Behavior and Poor Judgment at Crossings

In-depth data analysis of crossing incidents provides insight into several critical issues impacting crossing safety. An assessment of contributing factors and behaviors to Oregon's crossing incidents revealed that risky behavior and poor traveler judgment were the primary factors in most incidents. Understanding when and where these behaviors occur most often and who is involved will inform future safety improvement efforts. Strategic investment in key projects and initiatives can work to improve traveler judgment and reduce risky behavior at crossings, resulting in fewer incidents.

Younger male travelers were most frequently involved in crossing incidents, indicating this is a critical demographic to direct education and outreach efforts. Incidents occur most often during the lunchtime period, typically on weekdays, and most commonly on Friday. This suggests that travelers are possibly engaged in break time activities and less patient at crossings. Similarly, travelers often proceeded around activated gates or failed to stop at crossings with an approaching train, showing poor judgment and willingness to commit risky behavior. Oregon has seen a rise in bicycle and pedestrian related crossing incidents, illustrating that automobile drivers are not the only travelers engaging in these behaviors.

Poor traveler judgment is also seen in the significant number of incidents involving stalls and stops on railroad tracks and at crossings. This implies that drivers may need more training to better understand how to make the crossing safely and how to prevent stalls on tracks. Queuing is likely related and is important to understand as well. Further, CDL drivers were involved in many crossing incidents, suggesting improvement may be needed in CDL training.

In the past 10 years, most incidents occurred at crossings with low AADTs, low travel speeds and low train speeds, signifying that traveler judgment in these conditions is poor. Weather does not appear to be a significant factor in Oregon incidents, but time of year may play a role. Most incidents occurred in the winter months, suggesting that darkness may play a role in incidents. Summer was also a common time for incidents, potentially correlated to higher travel periods. While engineering solutions can attempt to reduce risky behavior, education and outreach are important complementary approaches to improve traveler judgment and reduce risky behaviors at crossings.

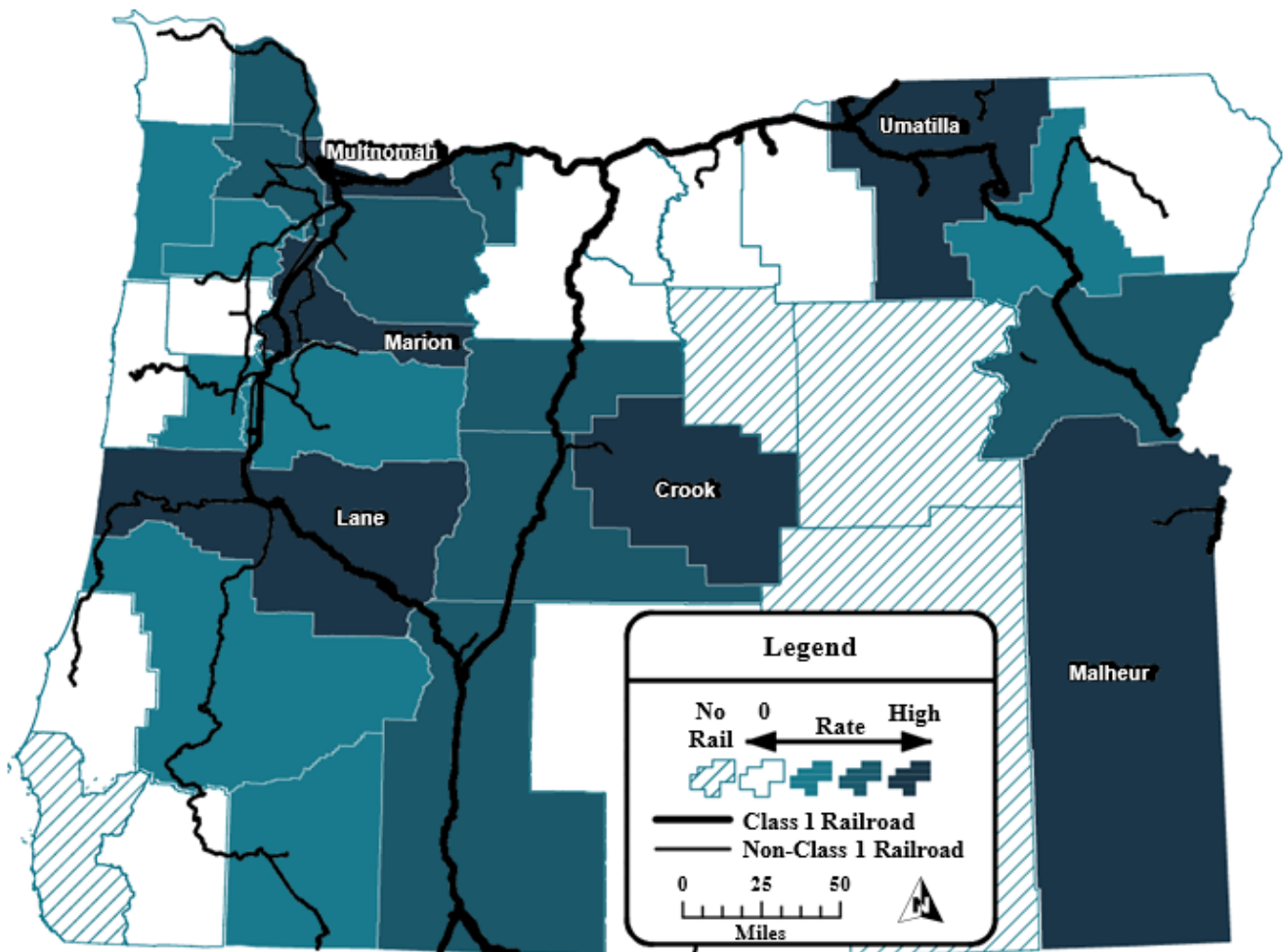


Stalling, getting stuck on tracks and stopping on tracks are a common factor in incidents.

Incident Locations

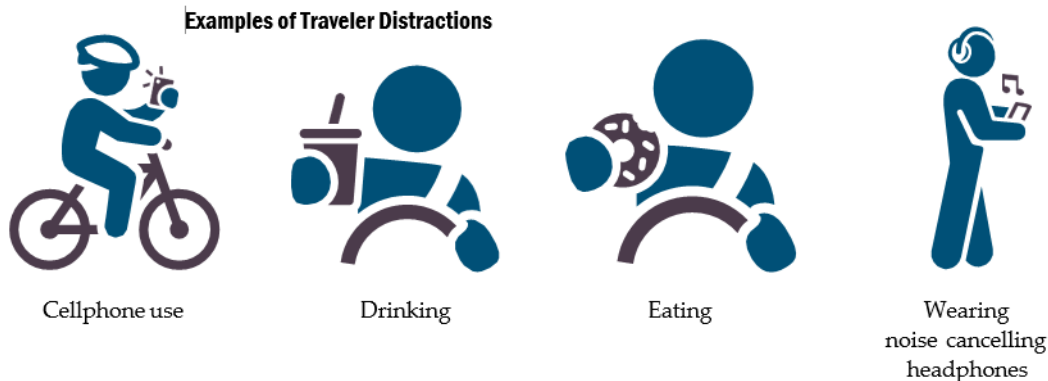
Oregon's population is largely concentrated in the Portland metropolitan area and Willamette Valley metropolitan areas (e.g. Salem, Corvallis, Eugene). These areas also have concentrations of railroad tracks with the highest number of crossings and the majority of urban crossings. Given the concentration of crossings in these population centers with rising AADTs, it is not surprising that a significant portion of incidents occur in these areas. However, it is also concerning that a high portion of Oregon crossing incidents occur in a few rural areas, namely Umatilla and Malheur counties. It is important to recognize the disparate nature of crossings statewide and strategically address these issues. The physical nature and warning devices of crossings may factor into traveler behavior at crossings. While 54% of incidents occurred at crossings with active devices, 46% occurred at crossings equipped with passive devices. It is likely that acute angle, severe vertical crossing rise and limited sight distance contribute to incidents. It is not feasible to improve all crossings, but crossings with the worst conditions can be prioritized for improvements, requiring coordination with local road authorities and railroads.

Rail Crossing Incident Rate per Oregon County 2008 - 2017



Behavior and Demographic Trends

A number of trends impacted traveler behavior and transportation safety. Distracted traveling, including using phones and wearing headphones is on the rise. A recent study found that three quarters of drivers surveyed had previously engaged in distracted driving.⁵ More in-depth studies and statistics are still being compiled at the state and national level but the consensus amongst transportation safety experts is that distracted traveling by all modes is a rising concern and threat to transportation safety. Implementing a coordinated education and outreach campaign between ODOT divisions and with external partners is an example strategy for addressing this trend.



Impaired driving, bicycling and walking is a major contributing factor to crashes on Oregon's transportation system including crossings. As noted in the TSAP, between 2009 and 2013, driver impairment was a factor in 22% percent of all fatal and injury crashes.⁶ Alcohol impairment is the most commonly recognized form of impairment, but impairment can also result from prescription drug use, marijuana and other drug use. Driver fatigue is also a form of impairment. Traveler impairment reduces cognitive abilities at crossings and is more likely to lead to poor judgment and risky behavior. Demographic trends also influence crossing safety. Oregon is experiencing a rise in older drivers. Although younger drivers are more likely to be involved in a crossing incident, older drivers face visual acuity, hearing and depth assessment challenges. These faculties are critical at crossings and such challenges make it difficult for older drivers to detect critical signage, markings or an approaching train. If involved in an incident, older travelers are more likely to experience more severe outcomes than younger travelers. The FHWA published the Handbook for Designing Roadways for the Aging Population. Chapter 6: Highway-Rail Grade Crossing, which provides guidance for improving crossings to accommodate the needs of older drivers.

⁵ Angela Durant et al. Distracted Driving: An Epidemic, A Study of Distracted Driving Attitudes, Behaviors, and Barriers Preventing Change. Southern Oregon University, prepared for Oregon Department of Transportation. <https://www.oregon.gov/ODOT/Documents/Distracted%20Driving%20An%20Epidemic.pdf>.

⁶ [Oregon Department of Transportation](#), Oregon Transportation Safety Action Plan (2016)

Competing Transportation Priorities

Oregon's population is growing and Oregonians are seeking more active modes of travel and recreation, resulting in new commercial, residential and education developments. Changes in land use adjacent to railroad right-of-way often increase crossing volumes. Land use changes also result in new crossing requests. Similarly, increased interest in active transportation has led to development of new multi-use pathways, also initiating new crossing requests. State statute provides that grade crossings are to be eliminated wherever possible, which stresses that new grade crossings must meet a rigorous review process to determine if they are required for "public safety, public convenience, and general welfare". CCD, using current funding sources, is not permitted to fund the establishment of new grade crossings. Regardless, new crossing requests are increasing and system impacts may not be fully understood. Economic effects such as the pandemic can impact traffic, bicycle, and pedestrian volumes on both the roadway systems and the railroad system. This issue is not limited to urban areas as Oregon's rural areas are experiencing similar trends. Balancing transportation safety with system efficiency and mobility requires understanding of the needs and impacts, particularly at railroad crossings.

Oregon is also experiencing travel growth in alternate travel modes, recording increases in bicycle and pedestrian travel in recent years. While Oregon's transportation system infrastructure is continuously growing and improving to accommodate all users, there is still room for improvement around and particularly at crossings. Railroad crossings present unique challenges for multimodal users. For example, pedestrian sidewalks are often difficult to construct due to excessive costs associated with widening the crossing to accommodate the sidewalk, which includes acquiring additional right-of-way. An expanding on-street bicycle network with designated bike lanes presents channelization difficulties at many crossings. Also, existing crossings with severe intersection angles make multimodal crossings particularly difficult for safe crossing. Additionally, poor crossing conditions such as slippery crossing surfaces, rough surfaces and holes and major gaps are also examples of these challenges.

Route Priority Considerations in project prioritization.



School Bus



Hazmat



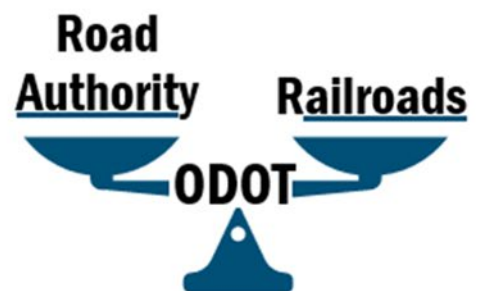
EMS



OHP Freight

Balance and Coordination

CCD facilitates project coordination between railroads and road authorities.



System Impacts

Studies have assessed the economic cost of highway crashes, accounting for loss of life, lost wages, cost of travel delay, medical expenses, property damage and additional costs to employers. The cost of railroad crossing incidents goes beyond these measures, additionally accounting for system delay due to extended periods of blocked crossings, economic hardship to railroads, freight system delay, environmental impacts of congestion and other system delays such as shared line passenger transit delay.

Data Sharing

ODOT is the steward for a significant collection of transportation system asset and crash information and is continuously improving the collection and utilization of data from a large set of sources. CCD collects a wide range of crossing information including physical characteristic information (e.g. warning device information, pavement markings, intersection angle, surface type, bus route information, etc.). CCD catalogs this information in the Rail Crossing Safety System (RCSS) database, which can be queried as needed. CCD also collects incident information obtained from FRA and collaborated with police reports. However, this incident information is not currently cataloged in conjunction with the crossing characteristic information.

Additionally, data collaboration between ODOT divisions has potential for improved knowledge sharing and can lead to more an informed decision making processes. For example, crossing incident information combined with other sets of data from TSD and Transportation Data units could yield insights about behavior at intersections including railroad crossings.

As ODOT's data collection and warehousing efforts continue to evolve, incorporating railroad system and incident information will provide additional layers of information and support informed decision making.

Land Use Impacts

CCD works with many of road authorities and railroads on crossing safety projects. Many factors influence crossing projects and land use changes may greatly impact railroad crossings.

Localities with land use decision authority should consider the short- and long-term impact of development on crossings. For example, the development of an after school program activity center on a former light warehouse site near a crossing has crossing safety implications in terms of potential bus routing, increased pedestrian and bicycle activity and increased auto traffic. It is more effective and efficient to address potential impacts to the crossing prior to development rather than later. Local governments are encouraged to report changes in land use and traffic impacts to CCD but often fail to do so. These entities may be unaware of the need to engage CCD or unwilling to contact ODOT or the appropriate railroad.

Coordination

Transportation projects near crossings also often go unreported to CCD, sometimes leading to project impacts. Local road authorities may be unaware or not understand the need to engage CCD with regards to crossing regulation, including areas near crossings. Moreover, local road authorities may have misconceptions about the role of CCD and railroads. There is a need for clear and consistent information for when and how to engage with CCD and railroads including how CCD can assist local road authorities in communicating with the railroad. This information can be distributed by a number of methods such as the ODOT website, training materials, and through other resources such as League of Oregon Cities (LOC) or Association of Oregon Counties (AOC).

Working with Railroads

Engaging with railroads on local road projects near crossings is also challenging for local road authorities. Early coordination with railroads is important for crossing project success but is often hindered by slow response rates, lack of engagement or unwillingness to participate in the project.

Recognizing the significant role of railroads in crossing safety projects, CCD seeks to improve coordination between road authorities and railroads. To help railroads and local jurisdictions better understand the benefits of railroad crossing safety projects and the importance of early coordination, CCD will lead the effort for stronger coordination between these entities for improved project development and delivery processes.

CCD is in ODOT

ODOT's Rail Crossing Safety Unit is in CCD.

Oregon Transportation
Commission

ODOT Director

Revenue, Finance, and
Compliance

Commerce and
Compliance Division

**Rail Crossing
Safety Section**

Rail Safety

Rail Crossing Safety

Opportunities

Railroad Crossing Safety is part of ODOT

In many states, crossing safety oversight is implemented through the public utilities commission or similar agency that is not part of the statewide transportation agency. These agencies have the same regulatory and oversight authority as those railroad crossing safety agencies that are part of the department of transportation but must coordinate efforts with the transportation agency.

In Oregon, the crossing safety oversight is coordinated by ODOT through CCD. This arrangement affords close coordination and collaboration within ODOT, facilitating streamlined funding and project delivery processes as well as strong partnership opportunities for data coordination, driver training, education and outreach.

Similarly, in coordination with other ODOT divisions such as TSD, Research, DMV, Communications and TDD, CCD can employ a collaborative approach to improve crossing safety. This includes engagement in funding processes, driver training improvements, guidance development, participation in safety initiatives and exploring research opportunities. Furthermore, CCD and the Active Transportation Section can collaborate on initiatives such as multimodal crossing guidance, project application development processes and relevant rule making.

CCD provides information and analysis to the Oregon Transportation Commission (OTC), a five-person body appointed by the governor with the responsibility of establishing state transportation policy in Oregon. As part of ODOT, CCD may also influence legislative efforts as part of a larger transportation discussion. Through ODOT's "leadership teams" structure, CCD can engage and inform agency stakeholders on various processes, identify key areas for improvements and improve crossing project delivery.

Outside Partnerships

ODOT relies on strong partnerships with local agencies, other state agencies, railroads and stakeholder groups to implement system improvement initiatives. Building on these partnerships to address crossing safety, CCD plays a central role in coordination and collaboration. With local agency support, projects are more likely to progress efficiently. Local road authorities can promote local community support and relay safety benefits to stakeholders. Engaging railroads is often challenging for local road authorities. Whether identifying the appropriate railroad, engaging at the right time or working on project tasks, engaging with railroads can be complex and difficult. CCD can serve a critical role to promote communication between local road authorities and railroads.

Private sector companies and non-profit groups such as Oregon Operation Lifesaver have and will continue to play a pivotal role in crossing safety. Railroads play a major role in education and outreach as well as project delivery and training. CCD will be more engaged in existing safety awareness efforts and seek opportunities to expand on these efforts.

Local law enforcement agencies and Oregon State Police (OSP) also play an important role in crossing safety efforts. However, enforcement resources are very limited and especially so for crossing safety efforts. To better incorporate enforcement strategies in railroad crossing safety, local community support will be needed to dedicate resources to these efforts. Developing strong partnerships with local



communities and law enforcement will enable coordinated action efforts such as targeted enforcement and education campaigns.

ODOT is dedicated to working with private sector, non-profit groups and local entities on an integrated and strategic approach that combines targeted outreach, strategic education and coordinated enforcement to improve crossing safety. These efforts will also facilitate stronger project partnerships for future efforts.

Training

Training is an essential component of transportation system safety efforts. Engineers and project managers depend on up-to-date training to incorporate engineering standards and requirements and to understand project procedures. Training also provides information on best practices, railroad regulations and recommended practices, going beyond the Manual on Uniform Traffic Control Devices (MUTCD) guidance to promote the best approaches to crossing safety in Oregon. Currently, little railroad crossing safety training and guidance is offered by ODOT and there is an opportunity to develop and distribute this information. Through development of a railroad crossing curriculum, CCD can serve as the central source of crossing safety information and establish a foundation for providing pertinent and timely information on crossing project facts, funding process improvement strategies and best practices. Coordinated training may also expand avenues for information sharing, further improving project processes. By developing crossing guidance and training, CCD will provide stronger direction to local road authorities and ODOT divisions.

Emerging Technology

Emerging technology will impact the transportation sector, including crossings. Connected and autonomous vehicle (CAV) technology promises to transform transportation systems. Automated vehicles are already being tested and may soon be deployed. These technologies bring a range of policy implications as well as strategies for safety improvement at crossings.

Radar detection, track intrusion detection technology and ge-fencing are also examples of emerging technologies with implications to crossing safety. Several pilot projects have been implemented to study the possibilities of use and crossing safety implications. Recognizing the role and potential implications of technology is imperative for improving crossing safety. Working with railroads and other partners will be essential to incorporate technology into the transportation system for improved safety.

Legislative Input

ODOT works closely with the Oregon legislature on policies related to transportation. Railroad safety, including crossing safety is an important legislative topic. Backed with information, strategies and guidance from the Plan, ODOT can play a stronger role in crossing safety related legislation including potential funding mechanisms.

Emerging Technology



Connected and Autonomous Vehicles



Video Enforcement



Cameras



Radar/Lidar



Phones

Plan Goals

Introduction

The Plan goals provide direction for strategies and actions, uniting the overarching statewide policy framework to implementation opportunities. Objectives reflect the need and purpose of the Plan as well as measuring and reporting, which allows CCD responsiveness to addressing crossing safety needs.

Eight Goals of the Plan

- 1) Reduce the number of railroad grade crossings, including outreach towards closing private crossings.
- 2) Coordinate and collaborate with railroads, road authorities, and other stakeholders to improve railroad crossing safety.
- 3) Strengthen education and outreach about railroad crossing safety.
- 4) Strengthen enforcement of illegal trespassing and dangerous behavior near railroad crossings.
- 5) Apply engineering solution for improving safety
- 6) Apply corridor safety improvements.
- 7) Reduce the number and rate of crossing incidents, injuries and fatalities.
- 8) Increase grade crossing compliance of state and federal laws, including quiet zones.

Achieving Plan Goals

Achieving the goals will be met with numerous challenges. A course of sustained implementation efforts will be needed to overcome obstacles to achieving these objectives. The Plan's supporting objectives outline a path to achieving the goals through a coordinated and continuous path forward.

CCD must articulate and support the need for increased crossing safety funds. Calls for additional resources must be combined with efforts to improve current project processes to make the best use of limited funds. Furthermore, stakeholder engagement plays a significant role in ODOT's effort to improve crossing safety. Continuously engaging with stakeholders to understand the barriers to Plan objectives and how the evolving needs will serve as a strong foundation for Plan success.

Key Performance Measures

The Legislative Fiscal Office and the Budget and Management Division of the Department of Administrative Services adopted a set of criteria that state agencies must meet when developing measures. These measures and the progress toward them are reviewed during Oregon's biennial legislative session.

ODOT's Key Performance Measures (KPMs) exist to fulfill the following aims:

- Ensure transparency and accountability to the public and decision makers;
- Drive solutions and outcomes to meet ODOT's mission, goals, values, and statewide plans;
- Support and inform performance-based decision making;
- Support and inform effective resource allocation.

The visibility provided by the performance management system and KPMs support better and faster decisions and control of processes in the organization. KPMs drive solutions and outcomes to best manage systems and information. KPMs also support a process to provide valuable information for ODOT to identify gaps and issues that should be addressed. These measures are pivotal in identifying what is and is not working to meet the mission and inform resource allocations.

Objectives and Strategies

What follows is a discussion of specific strategies to improve safety at crossings identified in the Plan over period of at least 4 years. The objectives and strategies are on a 5-year plan of execution which will culminate with the submission a final assessment report to the Rail Safety and Compliance Section Manager.

Annual metric reports submitted to the ODOT Rail Safety and Compliance Section Manager will provide yearly objective assessments of progress towards achievement of the goals and strategies. The continuation of the Rail Crossing Safety Team initiatives that are underway is shown in [Appendix F](#).

Introduction

Objectives and strategies are the framework of the action plan and were developed through consideration of incident data analysis, stakeholder input, extensive research and agency discussions. The strategies include improved methods of targeted engineering, a focus on best practices and recognition of ODOT’s role in coordination and collaboration. Furthermore, the strategies will seek to leverage the limited resources and emphasize the important role of education, training, outreach and enforcement in crossing safety.

Plan strategies fall into three essential categories:

- 1) Collaboration and networking.
- 2) Improving safety at highway-railroad crossings.
- 3) Accountability and transparency.

Together, strategies in these categories comprehensively address crossing safety. Each strategy includes specific metrics for CCD management to actively monitor plan execution. When taken together, the Plan strategies and metrics provide a defined tracking progress toward meeting the goals. The Rail Crossing Safety Team will adhere to best practices.

Oregon Department of Transportation, Rail Crossing Safety

Goals, Objectives and Strategies — 2022-2027 Timeline Implementation

Goals	Objectives	Strategies	Metrics
Goal 1 Reduce the number of highway-railway crossings	Objective 1.1 Investigate and initiate closure of at least 2 at-grade crossings per year	Strategy 1.1 Collaborate with local road authority on potential closures with incentives	Metric 1.1 Annual report submitted to Rail Safety Manager January of each year
		Strategy 1.2 Continue emphasis on the importance of crossing consolidation to road authorities especially at diagnostics	Metric 1.2 Meeting notes pertaining to potential closures will be submitted as part of Metric 1.1 report.
Goal 2 Coordinate and collaborate with railroads, road authorities and other stakeholders to improve railroad crossing safety.	Objective 2.1 Establish collaborative meetings with road authorities twice per year	Strategy 2.1 Rail Safety Manager assigns specific road authorities to staff, meeting to include all relevant stakeholders	Metric 2.1 Annual reports submitted to Rail Safety Manager January of each year
	Objective 2.2 Collaborate with class 1 railroads quarterly, other railroads annually	Strategy 2.2 Continue to emphasis the importance of crossing consolidation to road authorities	Metric 2.2 Quarterly meeting notes submitted to Rail Safety Manager within 10 days of the meeting

Goals	Objectives	Strategies	Metrics
	Objective 2.3 Attend monthly Oregon Transportation Committee Meetings	Strategy 2.3 Rail Safety Manager or designee attend monthly Oregon Transportation Committee Meetings	Metric 2.3 Summary report by or to Rail Safety Manager
Goal 3 Strengthen Education and outreach about crossing safety	Objective 3.1 Plan and execute one safety outreach campaign per year	Strategy 3.1 Form action committee to research and implement goal	Metric 3.1 Progress report to Rail Safety Manager biannually
	Objective 3.2 Address driver education annually by engaging DMV	Strategy 3.2 Continue involvement with DMV handbook review	Metric 3.2 Progress to report to Rail Safety Manager
	Objective 3.1 Plan and execute one safety outreach campaign per year	Strategy 3.1 Form action committee to research and implement goal	Metric 3.1 Progress report to Rail Safety Manager biannually
Goal 5 Apply Engineering solutions for improvements.	Objective 5.1 Participate in MUTCD annual meeting regarding rail crossing safety	Strategy 5.1 Manager designates staff to attend	Metric 5.1 Staff to present MUTCD meeting summary to Rail Safety Manager, and other staff. Annual
	Objective 5.2 Allocate 100% of Section 130 funds.	Strategy 5.2 Improve project selection utilizing proven best practices	Metric 5.2 Annual HSIP report
Goal 6 Apply corridor safety improvements.	Objective 6.1 Complete LED installation on remaining active crossings (2-3 years)	Strategy 6.1 Manager designates staff project manager (PM)	Metric 6.1 Annual progress report to Rail Safety Manager
	Objective 6.2 Engage ODOT on battery backup to highway traffic cabinets at interconnected crossings (5 years)	Strategy 6.2 Manager designates staff PM	Metric 6.2 Annual reports submitted to Rail Safety Manager January of each year
Goal 7 Reduce the number and rate of crossing incidents, injuries and fatalities.	Objective 7.1 Create a baseline report analyzing 10-year incident data. (One year)	Strategy 7.1 Manager designates staff PM	Metric 7.1 Staff PM Reports to Rail Safety Manager, January 2023
	Objective 7.2 Stakeholder group to involve ODOT partners and employee best practices. Meet biannually.	Strategy 7.2 Form stakeholder group and assign lead. Year 1	Metric 7.2 Lead submits annual reports submitted to Rail Safety Manager January of each year
Goal 8 Increase compliance of state and federal laws including quiet zones.	Objective 8.1 Perform regularly scheduled inspections of each highway-railway crossing annually	Strategy 8.1 Establish to two full time FRA-certified state grade crossing inspectors.	Metric 8.1 Monthly and Annual report of inspection activity provided to Rail Safety Manager.
	Objective 8.2 Perform required number of GXI inspections	Strategy 8.2 Complete certification of 2nd FRA GXI	Metric 8.2 GXI certification completed
	Objective 8.3 Review each crossing incident	Strategy 8.2 Crossing staff reviews and collaborates on each incident. Manager to assign lead investigator. Standardized report created. Year 1	Metric 8.2 Incident report for each incident submitted to Rail Safety Manager

Measuring and Reporting

Tracking Progress

The Plan provides a blueprint for improving crossing safety. The goals and objectives guide efforts to achieve the Plan objectives. Plan implementation will be iterative and on-going, and progress should be assessed at various metric dates. Effectiveness of the Plan will be impacted by implementation of Plan objectives and other actions of ODOT and its partners.

Monitoring and measuring progress is important to understand where improvements are occurring and which areas need more attention. It will also inform future Plan iterations as well as other modal planning efforts.

Tracking progress of the Plan occurs in two ways:

- Tracking progress of individual objectives and related actions.
- Measuring effectiveness of the objectives in terms of crossing incidents.

Tracking the completion of Plan actions will inform the status of Plan implementation and serve as measures of progress. Examples include:

- Development of education materials.
- Number of outreach efforts completed.
- Number of enforcement efforts completed.
- Number of crossing inspected.
- Distribution of training materials
- Engagement in ODOT funding process (e.g. STIP, etc.).
- Outreach materials distributed.
- Funding sources identified including grants.
- Review of multiple incident locations.
- Metric reporting to Rail Safety and Compliance Manager.

Assessing Plan Effectiveness

The second approach for measuring Plan progress is to assess the effectiveness of the implementation of Plan objectives. This approach builds on tracking progress of individual objectives by evaluating their effectiveness of the through time-based progress indicators. In general, progress indicators should be accompanied with a desired effect. For example, reduction in number of incidents more meaningfully measures impact than a simple total number of incidents. Example progress indicators reviewed annually include:

- Reduced number of crossing incidents.
- Reduced number of vehicle, bicycle and pedestrian crossing incidents.
- Decreased severity of crossing incidents.
- Reduction in cluster location of crossing incidents.
- Reduced risky behavior activity at crossing incidents.
- Improved funding obligation efficiency.

As Plan implementation begins, measuring and tracking progress on objective implementation and Plan effectiveness will follow. An iterative and continuous process will facilitate improved Plan progress allowing CCD to pivot as needed for improvement.

Assess Crossing Incidents

Crossing incidents provide insight into traveler behavior and crossing safety hazards. CCD will continue to collect crossing incident data, analyze incidents and assess trends and progress at high- risk locations. CCD will establish an incident baseline for future progress tracking and continuously improve data collection efforts.

Key Performance Measures

ODOT regularly tracks and reports a series of KPMs, in relation to the statewide transportation goals. This assessment answers critical questions about how ODOT is meeting the goals of OTP and which areas need improvement. CCD reports on two railroad safety related KPMs in the form of a quarterly update and discussion with the OTC. ODOT tracks the following railroad related KPMs:

- Rail crossing incidents – number of highway- railroad at-grade incidents.
- Derailment incidents – number of FRA-reportable derailments caused by human error, track or equipment.

The Plan indirectly supports the reduction of KPM “rail crossing incidents” by addressing overall crossing safety through a series of specific actions. CCD will support the KPM reporting process with specific measures and supporting actions directed for crossing safety improvement. CCD will provide details regarding the Plan and related initiatives. CCD will report on progress indicators, trends, successful initiatives, issues and opportunities related to crossing safety. Further, CCD will report on Plan progress as requested by the OTC.

Plan Reporting Measures

Although Plan status reporting is not currently required by FRA, the Plan has built-in reporting and metrics at the ready should future reporting be required. CCD does intend to report on Plan progress to Oregon’s crossing safety stakeholders, primarily through the standing Rail Advisory Committee (RAC). Additionally, CCD will continue regular reporting related to crossing incidents to the OTC as related to the KPM updates. Also, CCD currently reports to the Oregon legislature on crossing safety efforts as needed. Future reporting will include Plan information and updates.

Continued Reporting

As required by federal legislation, CCD reports regularly on Section 130 highway-rail crossing program progress and effectiveness of crossing improvements. The reports provide detailed information on crossing project delivery processes, cost assessments, crossing closures and safety improvements (e.g. warning devices, lighting upgrades, signs, etc.); and they are completed annually and included in the Highway Safety Improvement Plan (HSIP) report. Future reports will include Plan action implementation information for actions that utilize Section 130 funds.

Rail Advisory Committee

Internal and external stakeholders play a key role in ODOT’s planning processes and plan implementation. Regular reporting is essential for information sharing and continuous improvement. CCD will regularly report to the RAC on Plan progress, key initiatives and improvements. Additionally, CCD will seek RAC engagement at critical milestones or decision points as needed.

Legislative Reporting

CCD provides crossing safety information as needed to the Oregon legislature, primarily through the Joint Committee on Ways and Means. CCD provides specific information on project funding, safety initiative and related measures. CCD will continue to report as needed.

Next Steps

The Plan sets a guidance framework for CCD and crossing safety partners. It includes a series of objective and strategies. The Plan will implement objectives strategically based on resource availability and urgency.

High/Short – urgent objectives that are feasible in the near term with current resources and meet immediate needs.

Medium/Mid – short term objectives that require additional actions, information or resources to complete.

Low/Long – longer term efforts that are time constrained or require additional resources.

Each of the plan objectives are purposively defined and measurable.

CCD Staff

CCD staff, through the activities of the Rail Crossing Safety Unit Team, implements this Plan. Their role in crossing safety is central to all actions outlined in this Plan. CCD currently works to achieve the goals of the Plan, but future consideration for staff efforts will be essential for Plan success. Backed by a team of twelve FRA certified inspectors, CCD has “boots on the ground” collaborating from the field with the crossing safety team on rail crossing safety concerns.

The development of a staff-level implementation matrix will include who is responsible, other units involved and target completion dates will guide CCD direction. Identifying strategy “champions” who are responsible for seeing objectives to completion is a valuable process for successful action implementation. This will assist CCD in understanding how each effort relates to the Plan objectives and related crossing safety improvements. CCD will strategically commission consultant services for specific tasks related to crossing safety. Consultants can provide technical expertise and assist CCD in tasks such as data gathering, data analysis, and other crossing safety related initiatives.

Role of Stakeholders

Internal and external stakeholders play a key role in ODOT’s planning processes and plan implementation. Regular reporting is essential for transparent information sharing and continuous improvement. CCD will regularly report to the RAC on Plan progress, key initiatives and improvements, and seek input as needed. CCD will also engage additional crossing safety stakeholders as needed.

Future Updates

The Plan is a short-term action Plan, focusing on a five-year horizon. It is anticipated that regular updates will incorporate timely data analysis, relevant changes, lessons learned and action refinements. ODOT will work continuously with FRA on future Plan iterations and ensure that the Plan continues to meet FRA requirements.

Inform Other Plans

Although action oriented, the needs and details provided in the Plan will inform future modal plan processes, namely the OSRP update. Understanding pivotal factors and traveler behavior at crossings allows ODOT to better understand the unique needs of the railroad system overall. These needs will be factored into the OSRP as it is updated.

Partnering with ODOT Divisions and Units

This plan's foundation is connections. CCD will need to collaborate with other agency divisions for the most successful Plan implementation. To initiate implementation of the Plan, CCD will meet with impacted and associated units across ODOT.

The following are recommended coordination steps with ODOT units:

Transportation Safety Division (TSD)

- Partner on safety initiatives with overlap such as distracted driving, enforcement, outreach, DUII, driver training and multimodal focus.
- Coordination for improved data sharing.
- Coordination and collaboration with local law enforcement.

Transportation Development Division

- Planning and policy integration.
- Integrate grade crossing needs into Oregon State Rail Plan.
- Integrate grade crossing issues into Transportation System Plan (TSP) guidelines.
- Better articulate railroad and crossing safety needs in OTP, including emerging technology discussions.
- Participate in the Connect Oregon application process to promote crossing safety project efficiencies.

Transportation Planning Analysis Unit (TPAU)

- Complete analysis to better understand system impacts of crossing incidents, blockages and project improvements.

Active Transportation

- Work with the State Bicycle and Pedestrian Program Manager and Active Transportation Section Policy Lead on guidance development, application process, funding opportunities and design considerations.
- Continued project coordination to incorporate current and future bicycle and pedestrian needs.
- Participate in Oregon Bicycle Manual development process.
- Engage in relevant program application processes to ensure crossing safety is adequately addressed.

Transportation Data

- Improve data sharing and analysis opportunities.
- Improve data collection on crash report forms and related analysis.
- Better integrate railroad system, incident and project data in mapping systems (e.g. TransGIS).

Department of Motor Vehicles (DMV)

- Engage in driver licensing manual development process.
- Work to reach drivers at all ages, not just new drivers for continuous education.
- Information sharing at DMV offices (e.g. pamphlets, posters, etc.).

Research

- Utilize research options in place including simulators to understand driver responses to crossing specific situations.
- Coordinate with Technology Transfer (T2) Center for rail crossings safety training opportunities.

Communications and Public Affairs

- Maximize outreach opportunities targeting groups and geographic areas especially at risk for crossing incidents (e.g. young male travelers, Salem area, etc.).
- Utilize internal resources for information sharing such as broader ODOT railroad safety initiatives, project process training, etc.
- Develop an Outreach Plan to target high risk travelers or high-risk crossings. A draft “Communications and Outreach Plan” is included in [Appendix D](#).

Highway / Project Delivery Branch

- Incorporate crossing safety in highway investments.
- Work closely with ODOT railroad liaisons, both regional and statewide.

Partnering with Outside Agencies and Groups

Oregon Operation Lifesaver

- Provide timely and strategic education materials for distribution.
- Partner to develop strategic initiatives at high-risk crossings.
- Partner on shared opportunities for outreach.

Railroads

- Improve project process coordination.
- Coordinate with railroad safety initiatives (e.g. Safety Week, etc.).
- Reach out to railroads not typically involved in safety projects to educate and encourage stronger crossing safety project involvement.

Oregon State Police and Local Law Enforcement

- Reach out to gain better understanding of needs, resources and options for targeted enforcement efforts at high-risk locations.
- Develop enforcement pilot projects for testing.
- Coordinate outreach and education opportunities, emphasizing the risks and legal implications of crossing safety violations.
- Partner to improve crossing and trespass incident reporting and prevention efforts for all travel modes.
- Promote new enforcement technology implementation in high-risk crossing areas.

League of Oregon Cities and Association of Oregon Counties

- Provide coordinated training opportunities for local road authority engineers and planners.
- Utilize social media and internet resources to provide crossing safety information.

Conclusion

Oregon regularly commits significant investments toward crossing safety and has seen benefits of fewer crossing incidents. With the Plan as a guide, Oregon will continue its investments in crossing safety with the goal of no fatalities or life changing injuries resulting from crossing incidents.

The Plan sets forth a path to crossing safety improvements based on data analysis, research, stakeholder input and needs assessment. The framework of strategies cross over disciplines, combining best practice approaches for a comprehensive and innovative path forward. Implementing the strategies and related actions will require a continuous, coordinated and collaborative approach. Led by CCD, implementation of this Plan will result in stronger internal and external stakeholder engagement, improved funding mechanisms and strategic investments resulting in increased crossing safety in Oregon. With the Plan as a guide, project partners working together at all levels can achieve the goal of zero fatalities or serious injuries at Oregon’s crossings.

Rail Advisory Committee

Oregon’s standing statewide rail committee, the Rail Advisory Committee, provides input and guidance to ODOT on issues that impact freight and passenger railroad services in Oregon. Appointed by the Director of ODOT, committee members represent railroads, ports, freight interests and passenger rail services and are supported by CCD staff.

Individual	Group
David Arnold	AORTA - Wallowa Union Railroad
Gary Cardwell	Northwest Container Services
Glenn Carey	SMART Union
Bruce Carswell	Oregon Eastern Division
Robert Eaton	Amtrak
John Ficker	Retired
Johan Hellman	BNSF Railway
Aaron Hunt	Union Pacific RR
Paul Langner	Teevin Brothers
Chris Myron	Brotherhood of Locomotive Engineers
Ivo Trummer	Port of Portland

Appendix A

Oregon Railroads and other Entities with Operating Authority over Public Crossings.

Name	Code
Albany & Eastern Railroad Company	AERC
Astoria Riverfront Trolley	ARFT
BNSF Railway	BNSF
Central Oregon & Pacific Railroad, Inc.	CORP
City of Prineville Railway.....	COP
Clackamas Valley Railway.....	CVLY
Columbia Walla Walla Railroad.....	CWW
Coos Bay Rail Line	CBR
Goose Lake Railway, LLC	GOOS
Hampton Railway, Inc.	HLSC
Idaho Northern & Pacific Railway Company.....	INPR
Klamath Northern Railway	KNOR
Longview, Portland & Northern Railway Company.....	LPN
Mount Hood Railroad Company	MHRR
Oregon Coast Scenic Railroad.....	OCSR
Oregon Eastern Railroad	OERR
Oregon Pacific Railroad Company	OPR
Palouse River & Coulee City Railroad.....	PCC
Peninsula Terminal Company	PT
PGE Boardman.....	XPGE
Port of Morrow Railroad	XPOM
Port of Portland.....	POPZ
Port of Tillamook Bay Railroad.....	POTB
Portland Terminal Railroad Company	PTO
Portland & Western Railroad, Inc.	PNWR
Rogue Valley Terminal Railroad	RVT
Sumpter Valley Railroad Restoration Company	SUVX
Superior Veneer Company	GFPI
Tri County Metropolitan Transit Agency	TriMet
Union Pacific Railroad Company	UPRR
Valley & Siletz Railroad, LLC	VASR
Venell Farms Railroad Company	VFRC
Wallowa Union Railroad Company.....	WURR
Willamette Shore Trolley Line	COPX
Willamette Valley Railway Company.....	WVR

Appendix B

Highway-railway crossings experiencing more than one accident/incident in the past five years.
[CFR 234.11\(e\)\(1\)\(i,ii\)](#)

Year	Railroad	County	City	US DOT	Status	Street Name	Equipment	Vehicle Type
2016	PNWR	Washington	Hillsboro	749468E	Public	Wren Road	Passive	Auto
2018	PNWR	Washington	Hillsboro	749468E	Public	Wren Road	Passive	Auto
2017	UP	Malheur	Ontario	819436T	Public	5th Ave.	Active	Auto
2019	UP	Malheur	Ontario	819436T	Public	5th Ave.	Active	Auto
2020	ATK	Marion	Salem	759643V	Public	Blossom Dr.	Active	Other
2016	UP	Marion	Salem	759643V	Public	Blossom Dr.	Active	Pick-up truck
2017	ATK	Multnomah	Portland	759730Y	Public	SE 8th Ave.	Active	Pedestrian
2018	TPMO	Multnomah	Portland	759730Y	Public	SE 8th Ave.	Active	Other
2019	TPMO	Multnomah	Portland	759730Y	Public	SE 8th Ave.	Active	Other
2018	UP	Multnomah	Portland	808347V	Private	Private Rd	Passive	Pick-up truck
2018	UP	Multnomah	Portland	808347V	Private	Private Rd	Passive	Truck

Appendix C

Highway-railway crossings experiencing at least one accident / incident in the past three years.

[CFR 234.11\(e\)\(1\)\(i, ii\)](#)

Year	Railroad	County	City	US DOT	Status	Street Name	Equipment	Vehicle Type
2018	UP	Clackamas	Canby	760042H	Public	South Ivy St.	Active	Pedestrian
2018	PNWR	Marion	Salem	067223D	Public	Commercial St.	Active	Auto
2018	PNWR	Benton	Philomath	759235K	Public	North 13th St.	Active	Auto
2018	UP	Multnomah	Portland	759733U	Public	SE 11th Ave.	Active	Pedestrian
2018	ATK	Marion	Salem	759672F	Public	State St.	Active	Other
2018	TPMO	Multnomah	Portland	759730Y	Public	SE 8th Ave.	Active	Other
2018	UP	Multnomah	Portland	754246F	Public	Briarwood Rd.	Active	Other
2018	BNSF	Klamath	Malin	066942L	Public	Harpold Rd.	Passive	Auto
2018	CORP	Josephine	Merlin	759481V	Public	Merlin Landfill Rd.	Passive	Other
2018	UP	Multnomah	Portland	808347V	Private	Private Rd.	Passive	Pick-up truck
2018	UP	Multnomah	Portland	808403A	Private	Private Rd.	Passive	Truck-Trailer
2018	UP	Multnomah	Portland	975077F	Private	Private Rd.	Passive	Auto
2018	PNWR	Marion	Salem	067060W	Private	Private Rd.	Passive	Auto
2018	PNWR	Lane	Eugene	066478W	Private	Private Rd.	Passive	Pick-up truck
2018	UP	Lane	Westfir	766240Y	Public	North Fork Rd.	Passive	Auto
2018	CORP	Douglas	Dillard	759147A	Private	Private Rd.	Passive	Auto
2018	PNWR	Washington	Hillsboro	749468E	Public	Wren Road	Passive	Auto
2018	CORP	Douglas	Roseburg	759129C	Private	Private Rd.	Passive	Auto
2018	UP	Multnomah	Portland	808347V	Private	Private Rd.	Passive	Truck
2018	UP	Multnomah	Portland	807892J	Public	River St.	Passive	Truck-Trailer
2018	CORP	Lane	Creswell	756334X	Public	Rickett Rd.	Passive	Auto
2019	UP	Clackamas	Portland	759763L	Public	SE Harmony Rd.	Active	Truck
2019	TPMO	Multnomah	Portland	759730Y	Public	SE 8th Ave.	Active	Other
2019	TPMO	Multnomah	Portland	759735H	Public	SE 12th Ave.	Active	Other
2019	UP	Lane	Eugene	756536V	Public	Van Buren	Active	Other
2019	UP	Umatilla	Pendleton	809011C	Public	SW Frazier Ave.	Active	Auto
2019	UP	Malheur	Ontario	819436T	Public	5th Street	Active	Auto
2019	ATK	Lane	Springfield	756636A	Public	Mt. Vernon Rd.	Active	Truck-Trailer
2019	ATK	Marion	Salem	759652U	Public	Silverton Rd. NE	Active	Pedestrian
2019	ATK	Marion	Salem	759671Y	Public	Court St.	Active	Auto
2019	PNWR	Lane	Eugene	066491K	Private	Private Rd.	Passive	Truck-Trailer
2019	UP	Multnomah	Portland	759751S	Private	Private Rd.	Passive	Truck-Trailer
2019	PNWR	Benton	Corvallis	753926X	Public	Elliot Circle S.	Passive	Van
2019	OCSR	Tillamook	Rockaway	749541A	Public	Pansy St.	Passive	Auto
2019	UP	Hood River	Dodson	809197T	Private	Private Rd.	Passive	Auto
2019	CORP	Douglas	Dillard	759148G	Private	Private Rd.	Passive	Truck-Trailer
2019	OCSR	Tillamook	Garibaldi	927255K	Public	Garibaldi Pier	Passive	Pedestrian
2019	PNWR	Yamhill	Willamina	754074A	Private	Private Rd.	Passive	Pick-up truck
2019	PNWR	Marion	Salem	926894A	Private	Private Rd.	Passive	Auto
2019	PNWR	Washington	Beaverton	749317P	Private	Private Rd.	Passive	Auto
2019	UP	Baker	Haines	809451T	Public	Pole Line Lane	Passive	Pick-up truck

Year	Railroad	County	City	US DOT	Status	Street Name	Equipment	Vehicle Type
2019	BNSF	Deschutes	Redmond	910141W	Private	Private Rd.	Passive	Pick-up truck
2020	ATK	Clackamas	Milwaukie	75976	Public	Blossom Dr.	Active	Other
2020	ATK	Marion	Salem	759643V	Public	Blossom Dr.	Active	Other
2020	PCC	Gilliam	Arlington	906450C	Public	Cedar Springs Ln.	Active	Truck-Trailer
2020	UP	Marion	Salem	759669X	Public	Center St.	Active	Pedestrian
2020	ATK	Linn	Albany	759689J	Public	Elligson Rd.	Active	Auto
2020	UP	Hood River	Cascade Locks	810117U	Private	Private Rd.	Active	Truck-Trailer
2020	ATK	Multnomah	Portland	754559V	Public	SE Clay St.	Active	Pedestrian
2020	ATK	Multnomah	Portland	754552X	Public	SE Salmon St.	Active	Pedestrian
2020	UP	Lane	Springfield	766262Y	Public	Smith Rd.	Active	Pedestrian
2020	TMEV	Washington	Beaverton	927296P	Public	SW Millikan	Active	Truck
2020	UP	Umatilla	Hinkle	807676R	Public	Westland Rd.	Active	Auto
2020	UP	Lane	Eugene	756540K	Public	Washington St.	Active	Pedestrian
2020	PNWR	Marion	Salem	067023U	Public	Norway St.	Passive	Auto
2020	OCSR	Tillamook	Rockaway	749536D	Public	Old Pacific Hwy.	Passive	Auto
2020	PNWR	Marion	Salem	067194V	Private	Private Rd.	Passive	Pick-up Truck
2020	BNSF	Deschutes	Bend	066805E	Private	Private Rd.	Passive	Van
2020	PNWR	Lane	Eugene	066477P	Private	Private Rd.	Passive	Truck-Trailer

Incidents by Device Type and Percentage

Year	Device		
2018	Active	7	33%
	Passive	14	67%
2019	Active	9	43%
	Passive	12	57%
2020	Active	12	57%
	Passive	5	24%

Appendix D

Railroad Crossing Safety Communication and Outreach Plan

Communications and Outreach Plan to supplement Highway-Railroad Crossing Safety Action Plan.

Goal: Oregon sees a reduction in the number of incidents, including fatalities, at railroad crossings, annually.

Strategy: Using powerful messaging, communicate to audiences that play a major role in crossing incidents so that they understand their risky behaviors are causing incidents that impact more than just themselves when they are hurt or die; it hurts train employees, bystanders and everyone else involved. In the battle between a train and a car, a pedestrian or a bicyclist, the train always wins.

Audiences

- Younger drivers. Drivers under age 39: 53% of those killed at crossings involved drivers under age 39 (32% under age 29).
- Rural drivers. 32% of the incidents where someone was killed occurred at crossings where the average annual daily traffic count is under 500 (41% where AADT is under 1000).
- Men (drivers, pedestrians). Some 74% of the incidents involved male travelers.
- Multnomah, Marion and Lane county drivers. These locations had the highest incidents, and the incidents most often occur during the afternoon hours: plenty of light and notice, but drivers think they can beat the train (stalls/stuck) or they aren't paying attention (stop and go/didn't stop at all).

Key Messages

- PAY ATTENTION. Most incidents and fatalities are occurring during the afternoon and at crossings that have gates, lights and bells.
- Trains usually can't stop in time before a collision; incidents at crossings can be completely eliminated, but it's up to drivers, pedestrians and bicyclists to make smart decisions.
- When people are hurt or killed at crossings, it's not just the victim's family and friends that are hurt – train employees and innocent bystanders suffer too.
- Incidents are on the rise: there are volumes of traffic and more things to distract drivers but the train always win in the battle with cars, pedestrians, or bicyclists so it's time to see "See tracks – think trains" and act accordingly.

Tactics: TBD, but may include:

Educational campaign about the dangers of crossings

- We will call on our partners to help fund and promote an awareness campaign.
- Tools and channels include social media, radio ads, billboards, videos, etc.
- Examples of successful campaigns from around the U.S. are available from [Operation Lifesaver](#). Many of these include the group's national message, "See tracks? Think train."
- Others create their own messaging based on targeted groups. Because we can identify our targeted group in Oregon, we may use different messaging, which we can test for effectiveness with focus groups.
- Here are some examples of successful messaging campaigns:
 - Pause your play; Stay alert, stay alive; don't let death metal become death by metal. (TriMet, Portland).
 - Eyes up, phone down. (Boston).

- Heads up, Look twice, Stand back, Stay off tracks. (NM).

Outreach to Other Safety Programs

- There are several programs throughout the department in which opportunities may exist to dovetail messaging or add new messaging (without watering down the other's message!), such as:
 - Driver's Education materials.
 - DMV educational materials.
 - Districted driving program.
 - DUII program.
 - Bike/Ped Safety.
 - Active Transportation program.

Next Steps

- 1) Finalize goals, strategies, and key audiences.
- 2) Create/finalize messaging and proposed tactics.
- 3) Secure funding and support from partners.
- 4) Execute plan to create tracking and reporting of objectives
- 5) Measure success, adjust plan.
- 6) Continue implementing until goals are met.

Appendix E — Tables

Summary of Oregon Railroad Crossing Incidents: 2008-2017

All information excludes confirmed suicide incidents unless otherwise noted.

Incident Summary

Table 1: Oregon Railroad Crossing Incidents Yearly Summary

Year	Total	Previous Year	Bike	Pedestrian	Vehicle	Fatalities	Injuries	Injuries
2008	12		0	0	12	2	1	1
2009	6	-50.00%	0	1	5	1	2	2
2010	18	200.00%	1	4	13	3	3	3
2011	9	-50.00%	0	2	7	1	3	3
2012	9	0.00%	1	0	8	0	1	3
2013	9	0.00%	0	0	9	0	0	0
2014	10	11.11%	1	2	7	3	4	4
2015	14	40.00%	1	2	11	5	2	2
2016	16	14.29%	1	1	14	3	7	7
2017	17	6.25%	0	3	14	2	6	6
Total	120		5	15	100	20	29	31

Table 2: National Railroad Crossing Incident Yearly Summary (suicides included)

Year	National Annual Total	National % Change from Previous Year	Oregon Total	Oregon % Change from Previous Year
2005	2986		18	
2006	3070	2.81%	19	5.56%
2007	2812	-8.40%	12	-36.84%
2008	2547	-9.42%	6	-50.00%
2009	2054	-19.36%	18	200.00%
2010	2009	-2.19%	9	-50.00%
2011	2055	2.29%	9	0.00%
2012	2046	-0.44%	9	0.00%
2013	2003	-2.10%	10	11.11%
2014	2262	12.93%	110	
Total	23844			

Table 3: Oregon Highway Crashes Yearly Summary

Year	Highway Crashes	Injuries	Fatalities
2005	44881	29023	487
2006	45219	29710	478
2007	44342	28006	455
2008	41816	26806	416
2009	41271	28153	377
2010	44094	30493	317
2011	49050	35031	331
2012	49797	36083	337
2013	49495	33149	313
2014	51244	35054	356
2015	55156	41754	445
2016	60049	44628	498
2017	57726	41628	439

Source: ODOT Transportation Safety Division

Traveler Information

Table 4: Number of Fatalities and Injuries by Traveler Mode

Mode	Number of Fatalities (Suicides included)	Number of Fatalities	Number of Injuries	No Injury	Total
Vehicle	11	10	20	80	100
Bicycle	3	3	2	0	5
Pedestrian	15	7	7	1	15
Total	29	20	29	81	120

Table 5: Oregon Railroad Crossing Incidents by Gender

Gender	Incidents	Number of Incidents no data available	Percentage % of total
Male	79		68%
Female	37		32%
Total	116	4	

Table 6: National Railroad Crossing Incidents by Gender

Gender	National Incidents by Gender (2005-2014)	Percentage % of total
Male	16908	75%
Female	5526	25%
Total	22434	

Table 7: Oregon Total Incidents by Age of Traveler 2005-2014 and 2008-2017

Age	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	'15	'16	'17	Oregon Total 2005-2014	Oregon Total 2008-2017
<29	6	6	7	0	3	4	1	1	3	3	2	2	4	34	23
30-39	2	1	3	4	0	4	2	4	1	2	2	2	5	23	26
40-49	2	3	0	3	1	2	1	1	2	0	4	5	3	15	22
50-59	1	4	1	1	0	1	1	2	2	0	2	4	1	13	14
60-69	0	0	3	1	1	0	2	1	0	1	2	2	2	9	12
70-79	1	1	0	0	0	0	0	0	0	0	1	0	0	2	1
80-89	1	1	1	0	0	0	1	0	0	1	0	0	1	5	3
90+	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0

Table 8: National Total Incidents by Age of Traveler 2005-2014 and 2008-2017

Age	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	Total	National Total 2005-2014	National Total 2008-2017
<29	774	709	680	600	423	462	472	467	464	512	5563	5563	3400
30-39	539	498	473	416	304	331	330	308	332	342	3873	3873	2363
40-49	463	509	446	380	335	319	336	317	347	348	3800	3800	2382
50-59	331	342	367	328	261	314	320	335	354	374	3326	3326	2286
60-69	183	180	179	143	145	158	144	173	189	228	1722	1722	1180
70-79	120	129	98	100	79	92	89	93	90	96	986	986	639
80-89	73	47	69	51	51	54	50	42	51	52	540	540	351
90+	5	6	6	8	5	14	11	7	7	15	84	84	67

Note: Information is not available for all.

Table 9: Behavior of Traveler at Time of Incident

Behavior	Incidents
Stop and Go/Didn't Stop	47
Stall / Stuck on Tracks	41
Went Around Gates	18
Total	106

Note: Information is not available for all.

Locations

Table 10: County Summary

Total County	Incident	Total Injury or Total Fatal	Property Damage Only	Percentage %
Baker	2	0	4	1.7%
Benton	1	0	0	0.8%
Clackamas	5	3	1	4.2%
Columbia	3	1	0	2.5%
Crook	1	0	0	0.8%
Deschutes	3	0	0	2.5%
Douglas	2	1	0	1.7%
Hood River	2	0	0	1.7%
Jackson	1	0	0	0.8%
Jefferson	2	1	3	1.7%
Klamath	5	0	1	4.2%
Lane	15	2	3	12.5%
Linn	6	2	0	5.0%
Malheur	4	0	1	3.3%
Marion	23	2	6	19.2%
Multnomah	15	2	2	12.5%
Tillamook	1	0	0	0.8%
Umatilla	13	2	2	10.8%
Union	2	3	0	1.7%
Washington	13	1	6	10.8%
Yamhill	1	0	0	0.8%
Total	120	20	29	100.0%

Table 11: City Summary (highest to lowest)

City	County	Incident	Fatalities	Injuries	Property Damage Only
Portland	Multnomah	14	2	2	10
Salem	Marion	7	0	2	5
Eugene	Lane	6	1	2	3
no city identified	Umatilla	6	2	2	2
Hermiston	Umatilla	5	0	0	5
Junction City	Lane	4	1	0	2
Woodburn	Marion	4	1	1	2
Beaverton	Washington	4	0	2	2
Tualatin	Washington	4	0	2	2
Creswell	Lane	3	0	0	3
Albany	Linn	3	2	0	1
Hillsboro	Washington	3	1	1	2

Table 11: City Summary (highest to lowest)

City	County	Incident	Fatalities	Injuries	Property Damage Only
Haines	Baker	2	0	4	1
Oregon City	Clackamas	2	0	1	1
Scappoose	Columbia	2	1	0	1
Chiloquin	Klamath	2	0	0	2
Nyssa	Malheur	2	0	1	1
Ontario	Malheur	2	0	0	2
Donald	Marion	2	0	0	2
St. Louis	Marion	2	0	0	2
Pendleton	Umatilla	2	0	0	2
Tigard	Washington	2	0	1	1
Corvallis	Benton	1	0	0	1
Canby	Clackamas	1	2	0	0
Lake Oswego	Clackamas	1	0	0	1
Milwaukie	Clackamas	1	1	0	0
Rainier	Columbia	1	0	0	1
no city identified	Crook	1	0	0	1
Bend	Deschutes	1	0	0	1
LaPine	Deschutes	1	0	0	1
Sunriver	Deschutes	1	0	0	1
Roseburg	Douglas	1	0	0	1
Sutherlin	Douglas	1	1	0	0
no city identified	Hood River	1	0	0	1
Parkdale	Hood River	1	0	0	1
Central Point	Jackson	1	0	0	0
no city identified	Jefferson	1	0	0	1
Culver	Jefferson	1	1	3	0
no city identified	Klamath	1	0	0	1
Klamath Falls	Klamath	1	0	0	1
Malin	Klamath	1	0	1	0
Goshen	Lane	1	0	0	1
Springfield	Lane	1	0	1	0
Halsey	Linn	1	0	0	1
Lebanon	Linn	1	0	0	1
Tangent	Linn	1	0	0	1
Aurora	Marion	1	0	0	1
Brooks	Marion	1	0	1	0
Gervais	Marion	1	0	0	1
Jefferson	Marion	1	1	0	0
Keizer	Marion	1	0	1	0

Table 11: City Summary (highest to lowest)

City	County	Incident	Fatalities	Injuries	Property Damage Only
Marion	Marion	1	0	1	0
Talbot	Marion	1	0	0	1
Waconda	Marion	1	0	0	1
Rockwood	Multnomah	1	0	0	1
Rockaway	Tillamook	1	0	0	1
La Grande	Union	1	0	0	1
Union	Union	1	3	0	0
Amity	Yamhill	1	0	0	1
Total	ALL	120	20	29	79

Table 12: Incident Location: Urban and Rural Designation

Type	Incident Location Crossing Type (2008-2017)	Oregon Crossing Type (No TriMet)
Urban	87	976
Rural	33	806
Total	120	1782

Table 13: Incidents by Railroad

Railroad	Incidents	Fatalities	Injuries	Track	Track Mile	Crossings	Rate per Crossing
ERC	1	0	0	72	0.013888889	92	0.0109
BNSF	10	2	5	230	0.043478261	128	0.0781
COP	1	0	0	18	0.055555556	13	0.0769
CORP	7	1	0	247	0.028340081	169	0.0414
MHRR	2	0	0	21	0.095238095	18	0.1111
PNWR	38	2	8	447	0.085011186	571	0.0665
POTB	1	0	0	84	0.011904762	7	0.1429
UPRR	58	15	15	881	0.065834279	427	0.1358
WVR	2	0	1	33	0.060606061	45	0.0444
Total	120	20	29	2033			
AMTRAK	15	6	4	349.4	0.042930738		

Temporal

Table 14: Incidents by Time of Day

12 a.m. – 6 p.m.		6 a.m. – 12 p.m.		12 p.m. – 6 p.m.		6 p.m. – 12 a.m.	
17		33		43		27	
Hourly		Hourly		Hourly		Hourly	
12:00 a.m.	3	6:00 a.m.	3	12:00 p.m.	12	6:00 p.m.	4
1:00 a.m.	3	7:00 a.m.	7	1:00 p.m.	6	7:00 p.m.	5
2:00 a.m.	3	8:00 a.m.	6	2:00 p.m.	7	8:00 p.m.	2
3:00 a.m.	2	9:00 a.m.	1	3:00 p.m.	5	9:00 p.m.	7
4:00 a.m.	2	10:00 a.m.	4	4:00 p.m.	2	10:00 p.m.	4
5:00 a.m.	4	11:00 a.m.	12	5:00 p.m.	11	11:00 p.m.	5

Table 15: Total Incidents by Day of the Week

Day	Total Incidents
Sunday	6
Monday	20
Tuesday	21
Wednesday	15
Thursday	20
Friday	23
Saturday	15

Table 16: Oregon Incidents by Season and Month

Season	Number of Incidents
Spring	26
Summer	36
Fall	21
Winter	37

Month	Incidents by Month
January	16
February	5
March	6
April	9
May	11
June	11
July	12
August	13
September	7
October	9
November	5
December	16

Table 17: National Incidents by Month

Month	Incidents by Month (per billion VMT)
January	0.984
February	0.906
March	0.747
April	0.675
May	0.714
June	0.71
July	0.708
August	0.758
September	0.783
October	0.824
November	0.828
December	0.909

Crossing Characteristics

Table 18: Oregon Weather at Time of Incident

Weather	Number of Incidents
Clear	73
Cloudy	29
Foggy	2
Raining	11
Snowing	3
Undefined	2
Total	120

Table 19: Incidents by Warning Device

Type	Incidents	Fatalities	Injuries
Gates	62	13	17
Flashing Lights	64	13	17
Only Passive Signs	55	7	9

Table 20: Incidents by Warning Device

	Gates	Flashing Lights
Incidents	62	64
Fatalities	13	13
Injuries	13	13

Table 21: Incidents by Warning Device Type

Type	Suicides Included		Suicides Excluded	
	Active	Passive	Active	Passive
Incidents	74	55	65	55
Fatalities	21	3	12	3
Injuries	13	9	13	9

Table 22: Multi-Incident Locations Summary

Type	Number of Incidents
Repeat	40
One Time	80
Total	120

Note: Incident location characteristics are totaled for all incidents. Repeat locations are counted for each incident.

Table 23: Road Speed at Incident Locations

Road Speed (mph)	Number of Crossings
20 or less	19
21-30	52
31-40	20
41-50	13
51-60	13
61-70	0

Table 24: Number of Tracks

Number of Tracks	Incident Locations	Oregon
1	85	1455
2	24	255
3	5	49
4	3	12
5	0	3
6	0	0
7+	0	0

Table 25: Intersection Angle at Crossing with Incidents

Intersection Angle	Incident Locations	All
< = 45	12	134
46 – 84	37	410
85 – 95	38	840
96 – 135	17	328
136 – 160	3	63
Exactly 90	32	703

Table 26: Number of Travel Lanes

Number of Travel Lanes	Incident Locations	Oregon
1	9	183
2	85	1416
3	9	66
4	8	67
5	3	16
6	1	5
7	0	1
8	0	1
9	2	1

Table 27: Incident Location Roadway Jurisdiction

Jurisdiction	
City	58
County	49
State	10
Federal	0
Other	3

Table 28: AADT at Railroad Crossing

AADT at Railroad Crossing	Incident Locations	Oregon
<= 45	12	134
46 – 84	37	410
85 – 95	38	840
96 – 135	17	328
136 – 160	3	63
Exactly 90	32	703

Table 29: Safe Stopping Distance

Safe Stopping Distance (feet)	Incident Locations	Oregon
<100	4	215
101-200	62	804
201-300	23	457
301-400	8	234
401-500	5	39
501-600	13	115
>600	0	2

Multiple Incident Locations

Table 30: Incident Severity

Severity	Total
Fatal	8
Injury	13
Property/None	22

Table 31: Intersection Angle

Intersection Angle	Total
< = 45	2
46 – 84	10
85 – 95	4
96 – 135	1
136 – 160	1
Exactly 90	4

Table 32: Number of Lanes

Number of Lanes	Total
1	0
2	2
3	13
4	1
5	1
6	0
7+	0

Table 33: Number of Tracks

Number of Tracks	Total
1	0
2	10
3	5
4	2
5	1
6	0
7+	0

Table 34: Traveler Mode

Traveler Mode	Total
Car	19
Road Grader	2
Pedestrian	8
Bicycle	2
Truck	3
Motor Home	1
Truck & Trailer	3

Table 35: Warning Devices

Type	Total
Passive	12
Active	7

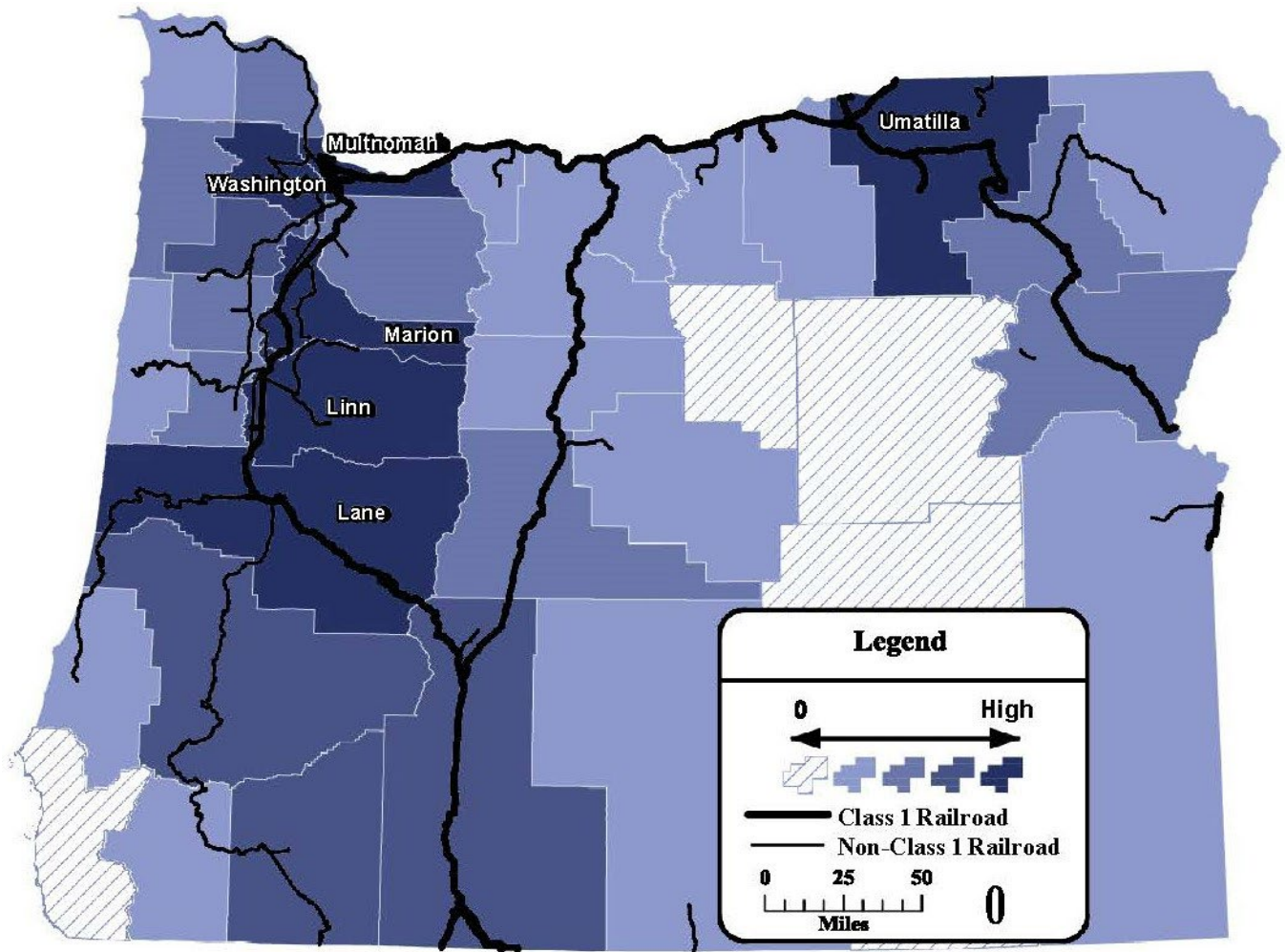
Table 36: Traveler Mode for Incidents

Traveler Mode	Incident Number
Pedestrian	8
Bicycle	2
Automobile	29
Total	39

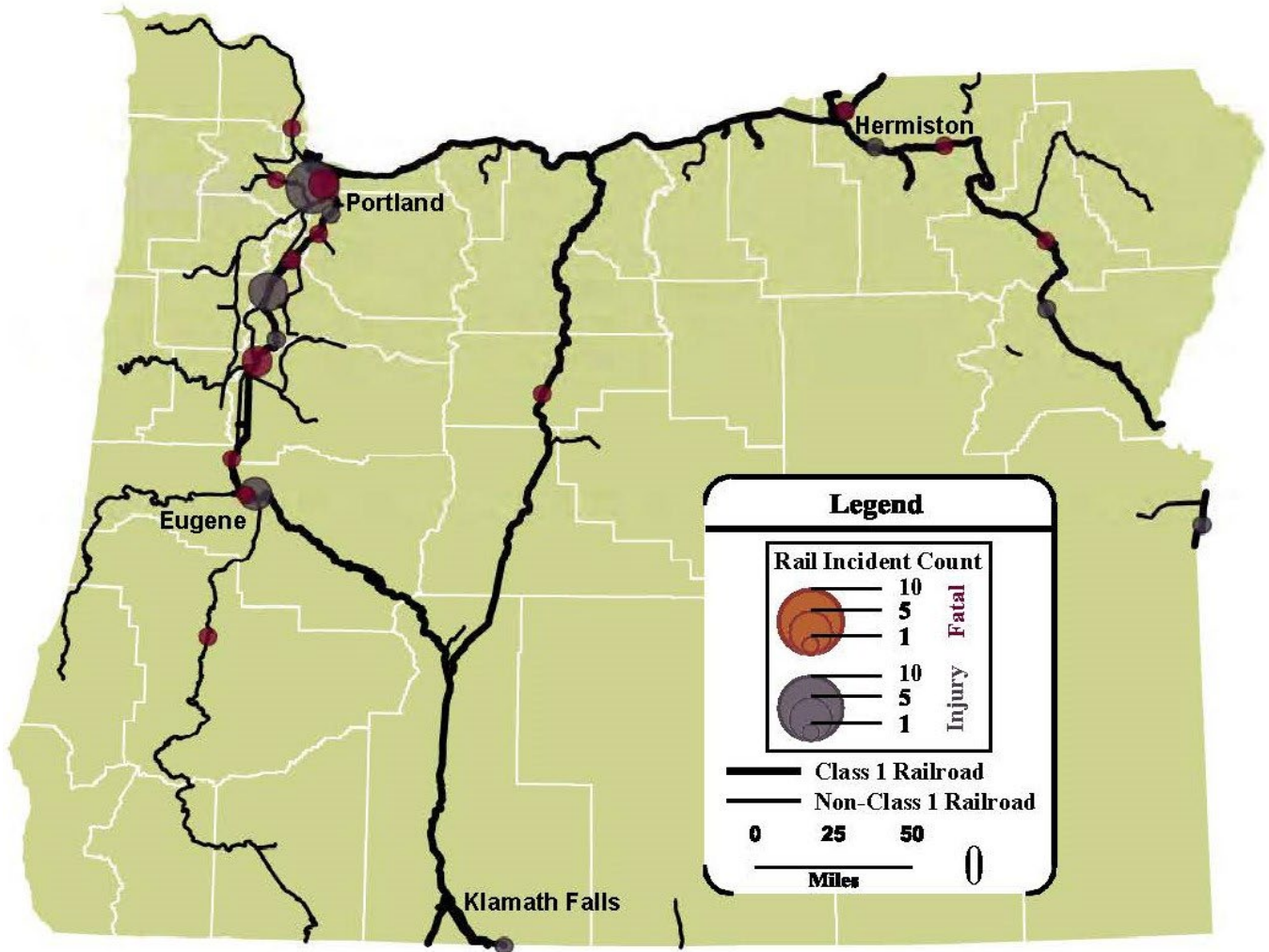
Table 37: Traveler Behavior

Traveler Mode	Incident Number
Stop and Go/Didn't Stop	14
Stall / Stuck on Tracks	19
Went Around Gates	6
Unidentified	1
Total	40

Map — Number of Public Crossings per Oregon County



Map — Railroad Crossing Incident Severity (2008-2017)



Appendix F

Ten Year incident history as reported to FRA by railroads

Year	RR	State	County	City	US DOT	Status	Street Name	Equipment	Vehicle Type
2011	UP	OR	Multnomah	Portland	808387T	Private	Private Road	Passive	Truck-Trailer
2011	UP	OR	Umatilla	Pendleton	809011C	Public	SW Frasier	Active	Pedestrian
2011	PNWR	OR	Columbia	Rainier	057982K	Private	Private Road	Passive	Truck-Trailer
2011	ATK	OR	Lane	Eugene	756537C	Public	Monroe St.	Active	Pedestrian
2011	UP	OR	Multnomah	Portland	759751S	Private	Private Road	Passive	Truck-Trailer
2011	CORP	OR	Douglas	Roseburg	917306R	Public	Edenbower	Active	Auto
2011	ATK	OR	Multnomah	Portland	754544F	Public	SE Alder	Active	Pedestrian
2011	ATK	OR	Clackamas	Oregon City	760017A	Public	10th Sreet	Active	Other Vehicle
2011	BNSF	OR	Klamath	Not Listed	748995V	Public	USFS Rd. #5811	Passive	Auto
2011	UP	OR	Clackamas	Not Listed	760031V	Private	Private Road	Passive	Other Vehicle
2011	ATK	OR	Marion	Salem	759672F	Public	State St.	Active	Van
2011	UP	OR	Marion	Woodburn	759605L	Public	Hardcastle St.	Active	Truck-Trailer
2011	UP	OR	Umatilla	Not Listed	809058X	Public	Canal Rd.	Passive	Other Vehicle
2011	UP	OR	Union	Not Listed	809363H	Public	McAlister Lane	Active	Truck-Trailer
2012	UP	OR	Lane	Eugene	756544M	Public	5th and High	Active	Pedestrian
2012	PNWR	OR	Marion	Woodburn	058343V	Private	Private Road	Passive	Pick-up Truck
2012	UP	OR	Marion	Gervais S	759624R	Public	Tacoma Street	Active	Van
2012	WVR	OR	Marion	Woodburn	759804N	Public	Cleveland	Passive	Auto
2012	UP	OR	Multnomah	Portland	808347V	Private	Private Road	Passive	Truck-Trailer
2012	PNWR	OR	Marion	Salem	067029K	Public	Front St.	Passive	Auto
2012	UP	OR	Multnomah	Portland	808435F	Public	NE Cully Road	Active	Truck-Trailer
2012	UP	OR	Linn	Tangent	759696U	Private	Private Road	Passive	Other Vehicle
2012	MH	OR	Hood River	Hood River	853925S	Public	Woodworth	Passive	Truck-Trailer
2012	PNWR	OR	Marion	Not Listed	926895G	Private	Private Road	Passive	Truck
2012	PNWR	OR	Marion	Not Listed	067177E	Public	Waconda Rd.	Passive	Auto
2012	ATK	OR	Lane	Eugene	756547H	Private	Private Road	Active	Other
2012	UP	OR	Umatilla	Hermiston	809057R	Public	South Ott	Passive	Other Vehicle
2012	ATK	OR	Multnomah	Portland	101880L	Public	17th Ave.	Active	Other
2012	CORP	OR	Douglas	Not Listed	756309P	Private	Private Road	Passive	Truck-Trailer
2012	BNSF	OR	Deschutes	Not Listed	066841A	Public	Vandevort Rd.	Active	Truck-Trailer
2013	COP	OR	Crook	Not Listed	847519G	Public	Lone Pine Rd.	Passive	Auto
2013	PNWR	OR	Marion	Not Listed	067185W	Private	Private Road	Passive	Truck-trailer
2013	CORP	OR	Lane	Creswell	756347Y	Public	Tate	Passive	Auto
2013	UP	OR	Umatilla	Not Listed	808085R	Public	Hermiston	Active	Van
2013	CORP	OR	Lane	Creswell	756335E	Public	Harvey	Active	Truck
2013	PNWR	OR	Lane	Eugene	066476H	Public	Awbrey	Passive	Auto
2013	PNWR	OR	Marion	Salem	067029K	Public	D St. A Front	Passive	Auto

Year	RR	State	County	City	US DOT	Status	Street Name	Equipment	Vehicle Type
2013	UP	OR	Multnomah	Rockwood	440996W	Private	Private Road	Passive	Pick-up Truck
2013	PNWR	OR	Lane	Eugene	066491K	Private	99W	Passive	Auto
2013	PNWR	OR	Washington	Beaverton	749318W	Private	Private Road	Passive	Auto
2013	UP	OR	Umatilla	Pendleton	809011C	Public	SW Frazier St.	Active	Pick-up Truck
2013	PNWR	OR	Clatsop	Westport	910160B	Private	Private Road	Passive	Auto
2013	TMEV	OR	Washington	Beaverton	927295H	Public	Canyon	Active	Auto
2013	UP	OR	Umatilla	Not Listed	809057R	Public	Ott Road	Passive	Auto
2013	UP	OR	Klamath	Not Listed	748924Y	Private	Private Road	Passive	Auto
2014	CORP	OR	Jackson	Medford	756043H	Private	Private Road	Passive	Truck-Trailer
2014	UP	OR	Linn	Albany	759683T	Public	Queen Avenue	Active	Other
2014	UP	OR	Multnomah	Portland	810142C	Public	NW Naito Park	Active	Pedestrian
2014	PNWR	OR	Columbia	Rainier	057987U	Private	Private Road	Passive	Auto
2014	PNWR	OR	Marion	Jefferson	067083D	Public	Wintel Road	Passive	Auto
2014	UP	OR	Marion	Salem	760051G	Public	Hines Street	Active	Pedestrian
2014	ATK	OR	Linn	Albany	759679D	Public	Madison St.	Active	Pedestrian
2014	PNWR	OR	Marion	Donald	058328T	Private	Private Road	Passive	Auto
2014	ATK	OR	Marion	Not Listed	760073G	Public	Duck Flat Rd.	Passive	Truck-Trailer
2014	TMEV	OR	Washington	Tualatin	058305L	Public	Tonquin Rd.	Active	Truck-Trailer
2014	UP	OR	Lane	Not Listed	912099G	Public	North Fork Rd.	Active	Pick-up Truck
2014	PNWR	OR	Washington	Hillsboro	749342X	Public	River Road	Active	Auto
2014	UP	OR	Umatilla	Hermiston	809056J	Public	Highland Ave.	Passive	Pick-up Truck
2014	PNWR	OR	Marion	Salem	926895G	Private	Private Road	Passive	Pick-up Truck
2014	PNWR	OR	Washington	Beaverton	749204J	Public	Scholls Ferry	Active	Auto
2014	UP	OR	Lane	Eugene	756537C	Public	Monroe Street	Active	Pedestrian
2014	PNWR	OR	Lane	Eugene	974694V	Private	Private Road	Passive	Auto
2014	PNWR	OR	Columbia	Scappoose	057906S	Private	Private Road	Passive	Auto
2014	CORP	OR	Jackson	Central Point	756050T	Public	PINE St.	Active	Pick-up Truck
2015	CORP	OR	Douglas	Riddle	756060Y	Private	Private Road	Passive	Pick-up Truck
2015	ATK	OR	Multnomah	Portland	754557G	Public	SE Hawthorne	Active	Auto
2015	UP	OR	Klamath	Not Listed	749038U	Public	Homedale	Passive	Pick-up Truck
2015	PNWR	OR	Lane	Junction City	066447X	Public	18th Ave.	Passive	Van
2015	ATK	OR	Multnomah	Portland	101880L	Public	17th Ave.	Active	Pedestrian
2015	UP	OR	Multnomah	Not Listed	759751S	Private	Private Road	Passive	Truck-Trailer
2015	CORP	OR	Douglas	Dillard	756307B	Private	Private Road	Passive	Truck-Trailer
2015	UP	OR	Multnomah	Portland	808386L	Public	N. Columbia	Active	Van
2015	UP	OR	Umatilla	Not Listed	809086B	Public	Cunningham	Passive	Pick-up Truck
2015	ATK	OR	Marion	Salem	759656W	Public	Sunnyview Rd.	Active	Pedestrian
2015	CORP	OR	Lane	Creswell	756332J	Public	Dillard Rd.	Passive	Auto
2015	CORP	OR	Douglas	Riddle	756059E	Private	Private Road	Passive	Truck-Trailer
2015	PNWR	OR	Multnomah	Portland	057870L	Public	NW 112th	Passive	Pick-up Truck

Year	RR	State	County	City	US DOT	Status	Street Name	Equipment	Vehicle Type
2015	PTO	OR	Multnomah	Portland	092381T	Public	NW Front St.	Active	Pick-up Truck
2015	UP	OR	Lane	Eugene	756539R	Public	Jefferson and 3rd	Active	Pedestrian
2015	UP	OR	Multnomah	Portland	808406V	Private	Private Road	Passive	Van
2015	PNWR	OR	Marion	Gervais	058359S	Public	St. Louis Rd.	Passive	Truck
2015	UP	OR	Linn	Albany	759683T	Public	Queen Avenue	Active	Other
2015	PNWR	OR	Marion	Salem	101309E	Public	Salem Industrial	Passive	Van
2015	UP	OR	Union	Not Listed	809372G	Public	Miller Lane	Passive	Auto
2016	BNSF	OR	Klamath	Malin	066951K	Public	State Line Rd.	Active	Auto
2016	PNWR	OR	Marion	Donald	058346R	Private	Private Road	Passive	Truck-Trailer
2016	TMEV	OR	Washington	Tualatin	916567M	Public	Pedestrian	Active	Other
2016	UP	OR	Lane	Eugene	756539R	Public	Jefferson St.	Active	Pedestrian
2016	PNWR	OR	Marion	Woodburn	058359S	Public	St. Louis Rd.	Passive	Auto
2016	PNWR	OR	Benton	Corvallis	759210P	Public	SW 17th Street	Passive	Auto
2016	PNWR	OR	Columbia	Scappoose	057910G	Public	Westlane Rd.	Active	Pick-up Truck
2016	UP	OR	Multnomah	Portland	808387T	Private	Private Road	Passive	Truck
2016	PNWR	OR	Washington	TIGARD	058284V	Public	Main Street	Active	Pedestrian
2016	ATK	OR	Lane	Not Listed	756428Y	Private	Prairie Rd.	Active	Auto
2016	BNSF	OR	Jefferson	Not Listed	066755D	Public	Gem Lane	Passive	Pick-up Truck
2016	UP	OR	Umatilla	Not Listed	809086B	Public	Cunningham Rd.	Passive	Truck-Trailer
2016	ATK	OR	Clackamas	Clackamas	759985V	Private	Private Road	Passive	Auto
2016	CORP	OR	Douglas	Sutherlin	758996E	Public	6th Street	Passive	Auto
2016	CORP	OR	Josephine	Merlin	759479U	Private	Private Road	Passive	Truck-Trailer
2016	PNWR	OR	Marion	Chemawa	067182B	Private	Private Road	Passive	Truck-Trailer
2016	PNWR	OR	Washington	Hillsboro	749468E	Public	Wren Road	Passive	Auto
2016	UP	OR	Marion	Salem	759643V	Public	Blossom Dive	Active	Pick-up Truck
2016	UP	OR	Umatilla	Not Listed	809044P	Public	River Road	Passive	Pick-up Truck
2016	ATK	OR	Clackamas	Oregon City	760017A	Public	10th St. & Singer	Active	Auto
2016	ATK	OR	Marion	Aurora	759578S	Public	Ehlen Road	Active	Truck-Trailer
2016	MH	OR	Hood River	Not Listed	853892G	Public	Mason Road	Passive	Truck-Trailer
2016	ATK	OR	Clackamas	Not Listed	760034R	Private	Private Road	Passive	Truck-Trailer
2016	UP	OR	Multnomah	Portland	808428V	Public	11th & Lombard	Active	Truck-Trailer
2016	UP	OR	Umatilla	Not Listed	809033C	Private	Private Road	Passive	Auto
2017	CORP	OR	Lane	Creswell	756348F	Public	Davisson Rd.	Passive	Pick-up Truck
2017	UP	OR	Malheur	Ontario	819436T	Public	5th Avenue	Active	Auto
2017	BNSF	OR	Deschutes	Bend	066813W	Public	NE Revere Ave.	Active	Other Vehicle
2017	UP	OR	Multnomah	Portland	808350D	Public	NE 148th Avenue	Active	Truck-Trailer
2017	UP	OR	Marion	Salem	760061M	Public	Madrona Ave.	Active	Pedestrian
2017	PNWR	OR	Columbia	Scappoose	101854W	Public	SW High School	Active	Pedestrian
2017	PNWR	OR	Washington	Beaverton	749212B	Public	Farmington	Active	Pedestrian
2017	PNWR	OR	Lane	Junction City	066453B	Public	9th	Passive	Auto

Year	RR	State	County	City	US DOT	Status	Street Name	Equipment	Vehicle Type
2017	ATK	OR	Linn	Not Listed	759690D	Public	Beta Rd. 351	Passive	Truck-Trailer
2017	ATK	OR	Marion	Not Listed D	759589E	Private	Private Road	Passive	Pick-up Truck
2017	PNWR	OR	Yamhill	Amity	754120Y	Public	B Road Mead Rd.	Passive	Other
2017	PNWR	OR	Columbia	Rainier	057981D	Public	2nd Street	Passive	Auto
2017	PNWR	OR	Linn	Albany	067123Y	Public	Thurston Water	Passive	Auto
2017	ATK	OR	Multnomah	Portland	759730Y	Public	SE 8th Ave.	Active	Pedestrian
2017	UP	OR	Marion	Salem	759625X	Public	Brooklake Road	Active	Other Vehicle
2017	BNSF	OR	Klamath	Not Listed	748980F	Private	Private Road	Passive	Van
2017	UP	OR	Baker	Haines	809448K	Public	3rd Street	Active	Auto
2017	UP	OR	Malheur	Not Listed	819430C	Public	Gamble Island	Active	Other
2017	UP	OR	Clackamas	Portland	807384U	Private	Private Road	Passive	Auto
2017	UP	OR	Lane	Eugene	756543F	Public	Pearl Street	Active	Auto
2017	UP	OR	Lane	Junction City	759795S	Public	4th Street	Active	Pedestrian
2017	UP	OR	Baker	Haines	809449S	Public	4th Street	Active	Auto
2018	BNSF	OR	Klamath	Malin	066942L	Public	Harpold Rd.	Passive	Auto
2018	UP	OR	Clackamas	Canby	760042H	Public	South Ivy Street	Active	Pedestrian
2018	CORP	OR	Josephine	Merlin	759481V	Public	Merlin Landfill	Passive	Other
2018	UP	OR	Multnomah	Portland	808347V	Private	Private Road	Passive	Pick-up Truck
2018	UP	OR	Multnomah	Portland	808403A	Private	Private Road	Passive	Truck-Trailer
2018	UP	OR	Multnomah	Portland	975077F	Private	Private Road	Passive	Auto
2018	PNWR	OR	Marion	Salem	067060W	Private	Private Road	Passive	Auto
2018	PNWR	OR	Marion	Salem	067223D	Public	Commercial St.	Active	Auto
2018	PNWR	OR	Benton	Philomath	759235K	Public	N 13th Street	Active	Auto
2018	UP	OR	Multnomah	Portland	759733U	Public	SE 11th Ave.	Active	Pedestrian
2018	PNWR	OR	Lane	Eugene	066478W	Private	Private Road	Passive	Pick-up Truck
2018	ATK	OR	Marion	Salem	759672F	Public	State St.	Active	Other
2018	TPMO	OR	Multnomah	Portland	759730Y	Public	SE 8th Ave.	Active	Other
2018	UP	OR	Lane	Not Listed	766240Y	Public	North Fork Rd.	Passive	Auto
2018	CORP	OR	Douglas	Dillard	759147A	Private	Private Road	Passive	Auto
2018	PNWR	OR	Washington	Hillsboro	749468E	Public	Wren Road	Passive	Auto
2018	CORP	OR	Douglas	Roseburg	759129C	Private	Private Road	Passive	Auto
2018	UP	OR	Multnomah	Portland	808347V	Private	Private Road	Passive	Truck
2018	UP	OR	Multnomah	Portland	807892J	Public	River Street	Passive	Truck-Trailer
2018	UP	OR	Multnomah	Portland	754246F	Public	Briarwood Road	Active	Other
2018	CORP	OR	Lane	Creswell	756334X	Public	Rickett Rd. 2106	Passive	Auto
2019	UP	OR	Clackamas	Portland	759763L	Public	SE Harmony	Active	Truck
2019	PNWR	OR	Lane	Eugene	066491K	Private	Private Road	Passive	Truck-Trailer
2019	UP	OR	Multnomah	Portland	759751S	Private	Private Road	Passive	Truck-Trailer
2019	PNWR	OR	Benton	Corvallis	753926X	Public	Elliot Circle	Passive	Van
2019	OCSR	OR	Tillamook	Rockaway	749541A	Public	Pansy St.	Passive	Auto

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2019	UP	OR	Hood River	Not Listed	809197T	Private	Private Road	Passive	Auto
2019	TPMO	OR	Multnomah	Portland	759730Y	Public	SE 8th Ave.	Active	Other
2019	CORP	OR	Douglas	Dillard	759148G	Private	Private Road	Passive	Truck-Trailer
2019	OCSR	OR	Tillamook	Garibaldi	927255K	Public	Garibaldi Pier	Passive	Pedestrian
2019	TPMO	OR	Multnomah	Portland	759735H	Public	SE 12th Avenue	Active	Other
2019	UP	OR	Lane	Eugene	756536V	Public	Van Buren	Active	Other
2019	UP	OR	Umatilla	Pendleton	809011C	Public	SW Frazier Ave.	Active	Auto
2019	UP	OR	Malheur	Ontario	819436T	Public	5th Street	Active	Auto
2019	PNWR	OR	Yamhill	Willamina	754074A	Private	Private Road	Passive	Pick-up Truck
2019	PNWR	OR	Marion	Salem	926894A	Private	Private Road	Passive	Auto
2019	ATK	OR	Lane	Springfield	756636A	Public	Mt. Vernon Rd.	Active	Truck-Trailer
2019	PNWR	OR	Washington	Beaverton	749317P	Private	Private Road	Passive	Auto
2019	ATK	OR	Marion	Salem	759652U	Public	Silverton Rd. NE	Active	Pedestrian
2019	UP	OR	Baker	Not Listed	809451T	Public	Pole Line Lane	Passive	Pick-up Truck
2019	BNSF	OR	Deschutes	Redmond	910141W	Private	Private Road	Passive	Pick-up Truck
2019	ATK	OR	Marion	Salem	759671Y	Public	Court St.	Active	Auto
2020	ATK	OR	Clackamas	Milwaukie	759756B	Public	Harrison St.	Active	Other Vehicle
2020	UP	OR	Lane	Eugene	756540K	Public	Washington St.	Active	Pedestrian
2020	UP	OR	Hood River	Not Listed	810117U	Private	Private Road	Active	Truck-Trailer
2020	PNWR	OR	Marion	Salem	067023U	Public	Norway St.	Passive	Auto
2020	ATK	OR	Marion	Salem	759643V	Public	Blossom Drive	Active	Other Vehicle
2020	ATK	OR	Multnomah	Portland	754559V	Public	SE Clay St.	Active	Pedestrian
2020	PNWR	OR	Marion	Salem	067194V	Private	Private Road	Passive	Pick-up Truck
2020	OCSR	OR	Tillamook	Rockaway	749536D	Public	Old Pacific Hwy.	Passive	Auto
2020	UP	OR	Umatilla	Not Listed	807676R	Public	Westland Road	Active	Auto
2020	TMEV	OR	Washington	Beaverton	927296P	Public	SW Millikan	Active	Truck
2020	BNSF	OR	Deschutes	Bend	066805E	Private	Private Road	Passive	Van
2020	ATK	OR	Multnomah	Portland	754552X	Public	SE Salmon St.	Active	Pedestrian
2020	UP	OR	Marion	Salem	759669X	Public	Center St.	Active	Pedestrian
2020	ATK	OR	Linn	Albany	759689J	Public	Ellingson Rd.	Active	Auto
2020	UP	OR	Lane	Springfield	766262Y	Public	Smith Road	Active	Pedestrian
2020	PNWR	OR	Lane	Eugene	066477P	Private	Private Road	Passive	Truck-Trailer
2020	PCC	OR	Gilliam	Arlington	906450C	Public	Cedar Springs	Active	Truck-Trailer