



Project Safety Management System (PSMS)

Biennial Status Report 2016



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1 INTRODUCTION

In 1991, the Intermodal Surface Transportation Efficiency Act (ISTEA) mandated that states develop and maintain six transportation management systems, one of which was a Safety Management System (SMS). As defined by the Federal Highway Administration (FHWA) a SMS is "a systematic process which increases the likelihood of reaching safety goals by ensuring that all opportunities to improve highway safety are identified, considered, implemented as appropriate, and evaluated in all phases of highway planning, design, construction, maintenance, and operations"

In response to the mandate, Oregon Department of Transportation (ODOT) began to develop a SMS. The National Highway Designation Act of 1995 made development of this management system optional, but ODOT recognized the benefits and has continued to develop a Safety Management System, comprised of the *Project Safety Management System (PSMS)*.

The Transportation Equity Act for the 21st century (TEA 21), enacted in 1998, provided for increased research funding for safety and continued the funding for safety improvement projects, the Hazard Elimination Program. The Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU), enacted in 2005, further increased federal funding for safety improvements through the Highway Safety Improvement Program (HSIP). The Moving Ahead for Progress in the 21st Century Act (MAP-21) continued the successful HSIP program, increasing safety funds yet again, strengthening the focus on Fatal and serious injury crashes and emphasizing safety on all public roads. The FAST Act

The primary features of the current HSIP are retained, including the requirement for a comprehensive, data-driven, SHSP that defines State safety goals and describes a program of strategies to improve safety. To obligate HSIP funds, a State must develop, implement and update a SHSP, produce a program of projects or strategies to reduce identified safety problems, and evaluate the SHSP on a regular basis. States are required to have a safety data system to perform problem identification and countermeasure analysis on all public roads, adopt strategic and performance-based goals, advance data collection, analysis, and integration capabilities, determine priorities for the correction of identified safety problems, and establish evaluation procedures.

The FAST Act did specifically limit HSIP eligible activities to those listed in statute, removing several of the non-infrastructure related activities from eligibility (i.e., enforcement) and limiting the eligibility to mostly infrastructure related activities.

In addition the FAST Act requires states to collect data on all public roads, a subset of roadway elements that are useful for analysis of roadway safety by September 30, 2026.

FHWA published the Safety Performance Measures (PM) Final Rules in the federal Register on March 15, 2016. The Safety PM Final Rule establishes five performance measures to carry out the HSIP, five year rolling averages of (1) Number of Fatalities, (2) Rate of Fatalities per 100 million VMT, (3) Number of Serious Injuries, (4) Rate of Serious Injuries per 100 million VMT, and (5) Number of Non-motorized Fatalities and Non-motorized Serious Injuries.

Other special features carried over from MAP-21 include that a State is required to obligate funds for high risk rural roads if the fatality rate on high risk rural roads increases. States are also required to incorporate strategies focused on older drivers and pedestrians (65 years and older) if fatalities and injuries per capita for those groups increase. A State that fails to have an approved updated SHSP on time will not be eligible to receive additional obligation limitation during the overall redistribution of unused obligation limitation that takes place during the last part of the fiscal year.

Report Summary

This biennial report on the progress of the PSMS fulfills the requirement in the *Safety Management System Agreement*, dated February 24, 2000 between the Oregon Department of Transportation and the Federal Highway Administration (FHWA). Below in tables are summaries of the accomplishments for different categories of activities for the calendar years 2015 and 2016. Each of the items is detailed in the corresponding sections of the report.

A key accomplishment was to develop and begin implementation of the All Roads Transportation Safety (ARTS) program last biennium. The ARTS program allocated funding for all public roads between 2017 and 2021 (a local roads only program was funded in 2014-2016 called the ARTS Transition). The ARTS program was focused on implementing a program to address safety on all Oregon public roads. The ARTS program consists of half hot spot projects and half systemic projects. In late 2014 the ARTS program began to kick off with the development of a list of potential projects to be considered for inclusion into the Statewide Transportation Improvement Plan (STIP). The inclusion of ARTS projects within the STIP is slated to be completed by the middle of 2017.

2 PROJECT SAFETY MANAGEMENT SYSTEM (PSMS)

The Oregon DOT's *Project Safety Management System* is a comprehensive data analysis and reporting system designed to improve the safety of Oregon's transportation system and reach all safety goals. The objective of the PSMS is to help in meeting ODOT's goal to reduce the traffic fatality rate in Oregon from 10 per 100,000 population in 2009, to 9.25 per 100,000 in 2020 and 8.75 per 100,000 in 2030. The PSMS and associated tools give highway project leaders and designers pertinent PC-based and internet based crash, safety, roadway and traffic mitigation information to perform safety analyses and make safety investments where they will count the most.

2.1 Summary of Accomplishments

Research Projects

These research efforts assist ODOT's Traffic-Roadway Section in development of guidance and completion of safety goals.

Status: Ongoing

Completed Research:

Smart Red Clearance Extensions to Reduce Red Light Running Crashes

Investigation of Bicycle and Pedestrian Continuous and Short Duration Count Technologies in Oregon

Improved Safety Performance Functions for Signalized Intersections

Effective Measures to Restrict Vehicle Turning Movements

Risk Factors Associated with High Potential for Serious Crashes

Implementing Safe and Effective Speed Reduction for Specific Freeway Work Zones

Developing Systemic Safety Analysis Tool for Pedestrians (NCHRP)

Safe and Effective Speed Reduction for Freeway Work Zones

Operational Guidance for Bicycle Specific Traffic Signals in the US

Current Research:

Improving Adaptive/Responsive Signal Control Performance

Safety Effectiveness of Pedestrian Crossing Enhancements

Stopping Compliance or Other surrogates for Pedestrian Crossings

Pilot and Evaluation of High Friction Surface Treatment

Pilot and Evaluation of Low Noise Rumble Strips

Risk Factors for Pedestrian and Bike Crashes

Right hook for bikes - alternative strategies to mitigate crashes

NCHRP Countermeasures to address risk factors for Bikes and Pedestrians

NCHRP Speed Setting Alternatives

Low cost countermeasures pooled fund study

Partnership between Traffic Roadway Section and Transportation Safety

In March of 1999, a formal Safety Management System partnership between Traffic-Roadway Section and Transportation Safety Division was established. This partnership has continued with regular communications including monthly meetings, joint committee work and ongoing coordination to provide engineering, education and enforcement solutions to transportation safety problems.

The Transportation Safety Division takes the lead role in development of Oregon's Strategic Highway Safety Plan (SHSP) as required by SAFETEA-LU. Traffic-Roadway Section participates in the development of the plan (Oregon's SHSP is called the "Transportation Safety Action Plan"). In addition Traffic-Roadway participates in yearly planning for the Oregon Safety Performance Plans and regularly participates in the Oregon Transportation Safety Committee Meetings and Traffic Records Coordinating Committee.

Status: Ongoing

Partnership between Traffic Roadway Section and Transportation Planning and Analysis Unit

In 2010, Traffic-Roadway Section and Transportation Planning and Analysis began meeting to coordinate efforts to implement the Highway Safety Manual (HSM) at ODOT. This coordination has continued with regular communications including monthly meetings, joint work on traffic analysis manuals and ongoing coordination to provide engineering safety analysis to transportation safety problems.

Both groups play a key role in developing and implementing the HSM at ODOT. Recently the groups have been working to include more HSM methods within the Analysis Procedures Manual.

Status: Ongoing

Crash Modification Factors (CMF's)/Crash Reduction Factor (CRF) List

Use of the CMF Clearinghouse website became somewhat difficult to use as an authoritative source of CMF's, consistency in application is difficult when trying to prioritize projects. Accurate crash reduction factors (CRF) are critical in selecting the most cost-effective countermeasures for highway safety improvement projects. The CRF list is the primary resource used by engineers for safety project development and evaluation. ODOT developed a new CRF list for the All Roads Transportation Safety Program. This was necessary so that all parties using the CRF's for cost benefit analysis could use the same CRF for any given countermeasure and there would not be different CRF's used for the same countermeasure.

Status: 100% Complete

Collision Diagramming

Traffic-Roadway and Region Traffic Units continue to work the Crash Data Unit to implement the Collision diagramming tool (Crash Magic). The tool continues to improve and will likely require some continued updates. The tool is useable and essentially complete but data improvements are being made.

Status: Ongoing

Update of TransGIS

ODOT supports the development and deployment of an easy to use and upgradeable mapping tool, TransGIS. The software is a simplified GIS in which users can generate maps of crash data, SPIS sites, pavement condition, ADT and other data.

Each year SPIS is incorporated into TransGIS. Other tools such as the locations for Roadway Departure Crashes priorities, Pedestrian and Bicycle priorities, and Intersection list are scheduled to be incorporated in TransGIS

Status: Ongoing

Update of TransInfo

ODOT has been developing and updating its corporate database. Much of the data contains roadway elements and asset data. Traffic-Roadway Section has been working closely with the TransInfo project to collect and update asset data and other data needed for Safety Analysis.

Status: Ongoing

Roadway Departure Plan Implementation

During the spring of 2010 Oregon participated with FHWA to develop a plan for reducing Roadway Departure Crashes in Oregon. Roadway Departure crashes account for approximately 66% of all fatalities in Oregon. Data analysis of Oregon Crashes was combined with cost effective strategies to identify locations for the most effective use of funds to achieve an approximate 20% reduction in roadway departure fatalities. This systematic approach involves deploying large numbers of relatively low cost, cost effective countermeasures on targeted segments of road with a history of roadway departure crashes.

Update of the Plan is planned for 2017.

Status: Ongoing Implementation

Intersection Safety Plan Implementation

Following up on the Roadway Departure Safety implementation Plan, Oregon developed a plan for reducing Intersection Crashes. The plan focuses on reducing fatal and serious injuries crashes at intersections. In Oregon an average of 72 fatalities Pedestrian and Bicycle plan followed a similar development as the Roadway Departure Plan. Identifying relatively low cost, cost-effective countermeasures and match them to intersections with a history of Intersections crashes. Implementation began with 2016 STIP on State Highways and then on all public roads in Oregon with the 2017 STIP and coincides with the ARTS program.

Status: Ongoing Implementation

Pedestrian and Bicyclist Safety Plan

The Pedestrian and Bicycle plan followed a similar development as the Roadway Departure Plan. Identifying relatively low cost, cost-effective countermeasures and match them to corridors with a history of or risk of Pedestrian and Bicycles crashes amenable to reduction.

The plan used two methods to identify potential corridors for pedestrian and bicycle. The first was to screen the network for each type of crash pedestrian and bicycle. The second developed the common risk factors associated with pedestrian and bicycle crashes and rank corridors by those risk factors. The goal was to flag the best potential corridors that agencies could investigate for improvement. Implementation began with 2016 STIP on State Highways and then on all roads in Oregon with the 2017 STIP and coincides with the ARTS program.

Status: Completed plan development and implementation is ongoing

Highway Safety Manual Implementation

There has been a growing recognition that transportation professionals lack the needed tools to explicitly consider safety when making decisions. Several years ago the need for including highway safety in the Highway Capacity Manual was raised. The Transportation Research Board recognized the need for a standalone manual on Highway Safety to provide the best factual information in a useful and widely accepted form.

The Highway Safety Manual (HSM) represents that effort to identify and assemble the best currently available information on safety and measures for performance, prediction and evaluation of safety. The HSM provides information and tools to assist in making decisions that have a positive impact on safety. The HSM is a tool for predicting the safety consequences of actions in design, policy, planning and operations.

The HSM contains syntheses of validated highway research and adopts that research for practice. It provides the foundation for analytical tools and methods for predicting the impacts of design decisions on highway safety. The HSM was released in 2010.

Continue implementation of Highway Safety Manual (HSM) methods into planning, project scoping and selection, including calibrating Safety Performance Functions, determining if new Safety Performance Functions or Crash Modification Factors need development and provide training for staff

Status: Ongoing

Highway Safety Manual (HSM) Pooled Fund Study

ODOT is participating in a FHWA sponsored pooled fund study (TPF-5(255) HSM Implementation Pooled Fund Study). The objectives of the study are to advance and expand the implementation of the HSM by state DOT's.

The research and products should help states accelerate their implementation of HSM thereby improving data analysis techniques and ultimately improving decision making.

Status: Ongoing

Highway Safety Engineering Committee

The Highway Safety Engineering Committee is a group of primarily ODOT representatives, including FHWA, Association of Oregon Counties Representative, that represent a diverse group of stakeholders and disciplines for implementing safety projects within Oregon. The group provides technical advice to the Safety Program Manager on policies and guidance for the Highway Engineering Safety Program within ODOT.

Status: Ongoing

Safety Investigators User Group

The Safety Investigators User Group was formed with Region Traffic Representatives and Central Traffic Staff as well as Safety Division staff. The purpose of the group is to meet and give input to central staff developing new tools, guidance and training. The group also receives information on the newest developments and helps guide the priorities of the development of ODOT's PSMS. The group also meets to discuss the yearly SPIS reports and FHWA reporting requirements.

Status: Ongoing

Safety Priority Index System (SPIS)

SPIS is an integral part of the PSMS and is described later in the report under “Network Screening”.

Roundabout Outreach

ODOT called a moratorium on building roundabouts in 2011 until such time that policies could be examined. ODOT worked with the Freight Industry to resolve design and policy issues regarding using roundabouts on State Highways and freight routes. ODOT completed the research and came to agreement with the Freight Industry on a process for implementing Roundabouts on State Highways.

ODOT continues to reach out to decisions makers through the state with education on Roundabouts and the safety benefits.

Status Ongoing

Data Requirements for Highway Safety Manual

The data requirement for the Fundamental Data Elements continue defining data needs for HSM methods, including analyzing FHWA requirements for a subset of MIRE data elements to be collected.

Status: Ongoing

Signalized Intersection Pilot Model Inventory of Roadway Elements (MIRE) Fundamental Data Elements (FDE)

FHWA published the Final Rule describing the Subset of MIRE data to be collected on public roads (MIRE FDE). The beginning stage of collection involves collecting signalized intersection elements. A plan has been developed for collecting the MIRE FDE with the Asset Management Group at ODOT.

Status: Ongoing

Work Zone Safety Implementation Plan

The Work Zone Safety Implementation Plan is an effort to analyze work zone crashes and validate current practices and improve on practices. The plan will offer possible opportunities for improvement to reduce work zone crashes statewide. Transportation Safety Division and Work Zone Traffic Control Plans Unit are continuing their implementation of strategies as well as the Director’s Work Zone Strategy Initiative.

Status: Plan Complete, Ongoing Implementation

Development of GIS tools for Analysis

ODOT collaborated with Eugene and Bend MPOs to develop a web based portal that provides access to crash data, establishes performance measures and charts progress towards those measures. The purpose is to enable data driven decision making in selecting projects or program to improve safety on roads in Oregon. The product was more of a pilot to investigate the necessary data and tools for developing a statewide prototype.

Status: Complete

Safety Investigation Manual (SIM) Workbook Update

The SIM workbook contains pattern diagnostics and crash pattern calculations and was updated using newer crash data. Two new Crash patterns were added for Weather conditions and Bike/Pedestrian.

Status: Complete

Benefit Cost Workbook Update

The update included drop down menus for all countermeasures and target crash type/severity. Also added were the costs for annual maintenance and operations costs. Crash data was used to update costs of crashes.

Status: Complete

Development of Crash Trends Report

In collaboration with the Crash Analysis and Reporting Unit, develop a series of templates for crash reports of trends for publication on the internet or a crash/safety dashboard of measures. This is turning into an ongoing conversation of the possibilities, data, and tools for developing such an automatic tool for keeping data up to date on the internet.

Status: Ongoing, planning to have something more developed in 2018

2.2 Summary of Planned Activities

Intergovernmental Agreements with PSU and OSU, Contracts with Consultants and Research Projects

Continue research in the following:

Stopping Compliance or Other surrogates for Pedestrian Crossings

Risk Factors for Pedestrian and Bike Crashes

Right hook for bikes - alternative strategies to mitigate crashes

Other possible research includes:

Best Safety Analysis Practices for Geospatial/GIS

Impact of Flashing Yellow Left Turn Arrow Signal Operations on Pedestrians

Evaluation of Low Cost Measures to Reduce Roadway Departure Crashes on Curves

Evaluation and Implementation Plan on Low Cost Measure to Reduce Wrong Way Drivers at Interchange Ramps

Feasibility of Using "High Friction Surface Treatments" at Targeted Locations in Oregon

Evaluation on How to Improve Crash Reporting on Indian Tribal Land in Oregon

Update Roadway Departure Safety Plan

This plan is in need of updating with new data and will be updated within the 2017-2018 biennium.

Update Intersection Safety Implementation Plan

The previous plan is now in need of updating. A decision about whether to update the plan or use MIRE FDE to create a new plan or some combination will be made in the 2017-2018 Biennium after the Roadway Departure plan is updated.

Develop an Older Driver Safety Implementation Plan

Develop a plan similar to Roadway departure and intersections for Older Driver if possible. Determine high risk locations for Older Driver crashes and several low cost measures to implement to reduce Older Driver crashes.

Develop a Wrong Way Driving Pilot Plan

Develop a pilot plan to investigate potential risk factors of Wrong way driving on Interstates within Region 3 (Southwest Oregon). The Pilot should develop a template for looking at high risk locations and investigating promising countermeasures to address wrong way driving.

Development of New crash reports

ODOT's Crash Analysis and Reporting Unit, Transportation Development Division, improved local agency reports in 2012. This effort would develop new reports similar to the familiar crash reports but use data from TransGIS, making it easier to select crash reports from GIS. Planned for 2015-16, but other efforts took priority.

3 HIGHWAY SAFETY PROGRAM - STIP

The Statewide Transportation Improvement Program, known as the STIP, is Oregon's four year transportation capital improvement program. It is the document that identifies the funding for, and scheduling of, transportation projects and programs and includes ODOT's Highway Safety Program projects. Funding for Highway Safety in the STIP is from several sources, the Highway Safety Improvement Program (HSIP) is the primary source of funding.

The *Highway Safety Improvement Program (HSIP)* is a federally funded program that mandates each state have a safety data system to perform problem identification and countermeasure analysis on all public roads, adopt strategic and performance-based goals, advance data collection, analysis, and integration capabilities, determine priorities for the correction of identified safety problems, and establish evaluation procedures.

The HSIP is made up of Highway Safety Improvement Projects and Highway Grade Rail Crossing (HGRX) Safety Projects. Highway Grade Rail Crossing Safety activities are reported by ODOT Rail Division and are not included in this report. The HSIP report also includes a table in the appendix which provides a 5-year moving average of fatalities and serious injuries for drivers and pedestrians age 65 and older as required under MAP-21. In addition there are Section 164 Penalty funds. Section 164 is a Highway Penalty Transfer Program (23USC 164). If a State does not enact and enforce laws regarding minimum penalties for repeat offenders for driving under the influence, certain Federal Aid highway funds are transferred into Highway Safety Improvement Program (HSIP) and used for highway safety activities.

The overall objective of HSIP is reducing the number and severity of crashes and decreasing the potential for crashes on all highways. Primarily the HSIP project funds are used to fund safety projects on state highways. Section 164 Penalty funds address Safety Emphasis Areas within the Oregon Transportation Safety Action Plan, including Roadway Departure safety, Intersection Safety and Pedestrian and Bicycle safety. MAP-21 increased the amount of HSIP funds available to states. ODOT designated the increases to go for Intersections and Ped/Bike Safety starting in 2016.

3.1 Summary of Accomplishments

Highway Safety Improvement Program (HSIP) Report

These reports detail ODOT's HSIP accomplishments for the fiscal years 2015 and 2016. The reports summarize the HSIP activities for the previous year and document the progress being made to implement safety improvements and the effectiveness of such projects.

Status: 100% Complete

Transition Program

ODOT implemented a transition plan in 2013 to fund \$16 million of safety projects on local agency roads until the ARTS program could get underway. The Transition funded a few select systemic countermeasure improvements in each ODOT region and focused on local agency roads. The projects are under development and some have been delivered.

Status: Completed development

All Roads Transportation Safety (ARTS)

The All Roads Transportation Safety (ARTS) Program is Oregon's implementation of the Federal HSIP program, a safety program to address safety needs on all public roads in Oregon through a data driven process.

Only by working collaboratively with local road jurisdictions (cities, counties, MPO's and tribes) can ODOT expect to increase awareness of safety on all roads, promote best practices for infrastructure safety, compliment behavioral safety efforts and focus limited resources to reduce fatal and serious injury crashes in the state of Oregon. The program will be data driven to achieve the greatest benefits in crash reduction and should be blind to jurisdiction.

In late 2012 ODOT reached out to the League of Oregon Cities (LOC) and the Association of Oregon Counties (AOC) to mutually agree upon principles for a Jurisdictionally Blind Program. The Memorandum of Understanding (MOU) documents the understanding of ODOT, LOC, and AOC reached to apply Federal Highway funding from the Highway Safety Improvement Program (HSIP) to roads managed by Oregon Counties and Cities. The MOU outlines the principles agreed to and some of the Federal requirements for HSIP funds, a few of which are:

- The program goal is to reduce fatal and serious injury crashes.
- The program must include all public roads.
- The program is data driven and blind to jurisdiction.

The program will be data driven and based on benefit cost analysis. Benefit cost analysis factors in the amount of crashes, crash reduction factors (CRF) and project costs. The program will prioritize projects based on benefit cost ratios - which locations will get the most crash reduction for the cost of the project. The program incorporates both hot spots and systemic improvements.

Program criteria have been developed for ARTS. The Highway Safety Program guide has been rewritten. Projects were selected for the draft STIP for 2017-2021.

Status: Completed Development of Program, adoption in the STIP should occur in 2017.

Systemic Safety Program

Systemic Safety Emphasis areas (Roadway Departure, Intersections and Pedestrian/Bicycle) have different measures that address their specific targeted crashes. The measures are relatively low cost and are particularly effective for the emphasis areas.

The implementation and planning of systemic safety is a significant departure from traditional methods of identifying potential safety projects. The systemic approach results in significantly more cost effective projects.

The actual projects themselves are challenging due the differences from traditional high priced projects. The application of measures is considerably more spread out and can be a challenge for effective project delivery. The continued enhancement of the Systemic process is necessary in order to not lose this valuable tool for reducing crashes.

ODOT continues to be committed to delivery of Systemic measures.

Status: On-going

Statewide Transportation Improvement Program (STIP) – SAFETY Summary

Just over about \$37 million per year was allocated for ARTS in 2017 and 2018.

The STIP allotment for safety was reduced in 2019-2021 due to unknown/unstable federal funding forecasts (MAP-21 was only extended through June of 2015). A summary is shown in the table below.

STIP Amounts for ARTS

Region	2017	2018	2019	2020	2021	5-Yr Total
1	\$12,129,970	\$12,129,970	\$10,169,366	\$10,169,366	\$10,169,366	\$54,768,038
2	\$12,646,900	\$12,646,900	\$10,395,506	\$10,395,506	\$10,395,506	\$56,480,318
3	\$5,492,450	\$5,492,450	\$4,922,905	\$4,922,905	\$4,922,905	\$25,753,616
4	\$4,260,300	\$4,260,300	\$3,211,195	\$3,211,195	\$3,211,195	\$18,154,186
5	\$2,393,380	\$2,393,380	\$2,146,595	\$2,146,595	\$2,146,595	\$11,226,546
Total	\$36,923,000	\$36,923,000	\$30,845,568	\$30,845,568	\$30,845,568	\$166,382,705

The Safety program for 2022-2024 is still to be announced but should be determined after the 2016-17 legislative session where there is consideration of a funding package increase.

Repeat Offender Transfer – Section 164 Penalty Funds

The Section 164 Penalty is a Highway Penalty Transfer Program (23USC 164). If a State does not enact and enforce laws regarding minimum penalties for repeat offenders for driving under the influence, certain Federal Aid highway funds are transferred into Highway Safety Improvement Program (HSIP) and used for highway safety activities.

Approximately \$9.5 million are available each year. These funds are used to exclusively fund projects to address Safety Emphasis Areas within the Oregon Transportation Safety Action Plan, primarily Roadway Departure Safety, Intersection Safety and Pedestrian/Bicycle Safety. The approach involves deploying relatively low cost and cost effective countermeasures on segments or intersections with a history of target crashes.

With the start of the All Roads Transportation Safety (ARTS) program, 164 funds as well as HSIP funds are integrated as part of the ARTS funds and will be used to continue to support systemic measures.

Status: Ongoing

Local Agency Training

ODOT through the Research Unit and Local Training and Assistance Program will hire a circuit trainer to help local agencies in Oregon learn about safety analysis techniques, how to obtain crash data, how to apply for funding and where to get assistance.

The status of this program is uncertain after 2017.

Status: Ongoing

Quick Fix Program

The quick fix program was implemented in 2007. The long lead time required to program safety projects in the STIP led ODOT to establish this dedicated "bucket" of safety funds for addressing immediate needs on State Highways in a timely manner. The program establishes a small pooled fund (about \$500K of state funds) that ODOT regions could use to address immediate highway safety concerns by implementing low cost measures or complete Road Safety Audits.

Status: Ongoing

Development of Performance Measurement Tool for STIP projects

ODOT Traffic-Roadway developed several prototypes of excel spreadsheets to measure performance of Safety Projects beyond the report to FHWA. Tested the crash reduction of total crashes and fatal and serious injury crashes plus compared crash rates before and after by region and for the entire state.

The report pointed out several difficulties with trying to objectively measure the performance of the safety projects and we believe the Highway Safety Manual will assist with eliminating some of the effects of regression to the mean in the simple before and after analysis.

Status: incomplete, on-hold

Development of Performance Measures

With the requirement for performance measurements in MAP-21, ODOT has been waiting to implement new measures. *Performance Measures for 2018 were included in the latest Transportation Safety Action Plan.*

Status: Complete

Training

Additional Safety Training for Local Agencies

Systemic Measures Training – documentation complete no formal training

Additional Highway Safety Manual training - complete

Human Factors Training – complete

Local Road Safety Peer Exchange - Complete

3.2 Summary of Planned Activities

Training

Additional Safety Training for Local Agencies – additional training should be coming from OSU in 2017

New Human Factors for work zones

HSIP Reports

Continue to improve the HSIP reports, with more comprehensive reporting, including developing better evaluation tools and better tracking of the projects, through the new project delivery tools being developed. ODOT implemented the new online HSIP reporting offered by FHWA. In 2017 FHWA is updating the tool to be even more inclusive of data they are looking for, this is going to require more effort and resources to complete than ever before.

Older Driver Program (special rule in MAP 21)

Analyze data for Older Driver Special rule each year. Also look at trying to develop an Older Driver plan similar to the Roadway Departure Plan and looking at low cost measures to implement systemically. Plan to recommend some path forward in 2017.

Develop a tool for evaluating before and after performance of individual projects in reducing crashes using HSM methods

ODOT currently uses before and after analysis for crash reduction comparisons. Develop spreadsheet tool for estimating the reduction in crashes due to the implementation of a safety countermeasures or multiple safety countermeasures on a project using Highway Safety Manual methods. Planned for 2015-2016 but ARTS development took priority.

4 NETWORK SCREENING

The *Safety Priority Index System (SPIS)* is a method developed in 1986 by the Oregon Department of Transportation (ODOT) for identifying potential safety problems on state highways. The development of SPIS complies with the federal Highway Safety Improvement Program (HSIP). When Oregon began developing its Safety Management System in response to the 1991 ISTEA, it identified SPIS as one of several essential building blocks. In 1996, based upon recommendations of Dr. Robert Layton at Oregon State University, changes were made in the weightings of indicator values (crash severity, crash frequency, crash rate) that make up the composite score.

SPIS is a tool used to identify crash history in 0.10 mile segments on state highways. SPIS scores are developed based upon crash frequency, severity, and rate. A prioritized list is created for each region (the top 10 percent of statewide SPIS sites) and is provided to regions annually for analysis and possible corrective action.

4.1 Summary of Accomplishments

2015 SPIS Reports Published

The SPIS reports are generated and distributed to Regions for investigation about midyear each year. In 2015 the Crash Analysis and Reporting Unit had an unusually high number of crashes and several unexpected losses of staff and thus as of Jan 2017 had not yet completed the crash data necessary for 2016 SPIS at the time of this report.

Below is summary for the last eight years.

Oregon Department of Transportation Safety Priority Index System 7 Year History Summary

Year	# Top 10% Sites	# Repeat Sites	# New Sites	10% Cutoff SPIS Value
2015	5,439	3,652	1,787 (33%)	45.05
2014	5,336	3,716	1,620 (30%)	45.52
2013	5,241	3,864	1,377 (26%)	44.82
2012	5,089	2,862	2,227 (44%)	42.51
2011	4,717	3,279	1,438 (30%)	42.38
2010	4,679	3,400	1,279 (27%)	41.60
2009	4,830	3,340	1,490 (31%)	43.60
2008	5,032	3,390	1,642 (33%)	44.27

FHWA required Top 5% report based on SPIS

As part of HSIP, states were required to submit an annual report describing not less than 5 percent of their highway locations exhibiting the most severe safety needs. This provision was eliminated in October 2012.

ODOT still uses our Safety Priority Index System (SPIS) tool to identify and prioritize its most severe safety needs. ODOT Regions investigate the top 5% (some regions investigate the top 10%) each year trying to identify potential fixes for the locations.

SPIS All Roads

Currently ODOT uses our Safety Priority Index System (SPIS) tool to identify and prioritize its most severe safety needs. The system generates SPIS for State Highways and now also includes all functionally classed public roads in Oregon.

Status: Ongoing

Oregon Adjustable Safety Index System (OASIS)

As part of the new SPIS All Roads Project, OASIS was developed. The “module” provides some additional flexibility for users to adjust SPIS formulas, to filter out certain crash types or road conditions and basically provide an “adjustable SPIS”. Loading, cleaning and developing reports for OASIS adds a small amount of overhead to the SPIS All Roads project, but provides a new system that is very flexible for ODOT, cities and counties to adjust SPIS to their own needs if they desire. The OASIS data includes interchange crashes where the SPIS program data does not.

OASIS was updated to include new filters for Roadway Departure Crashes, Intersection Crashes, and Pedestrian and Bicycle crashes

Status: Complete

4.2 Summary of Planned Activities

SafetyAnalyst

The SafetyAnalyst (through use of HSM methods) describes a superior method to perform network screening and potential problem areas. SafetyAnalyst requires data about the roadway elements and character in addition to crash and volumes to provide a network screening tool. ODOT has been collecting much of the data necessary but may be lacking some key components. Local agencies may be lacking much of the data required for network screening, but may be able to use the HSM methods on specific projects for decisions about the best options to employ.

Continue investigation into data needs and issues with implementing SafetyAnalyst. Investigate other products that may perform the same function using HSM methods.

With the beginning of collection of the MIRE FDEs (as described above in Signalized intersection pilot) ODOT will begin to utilize the HSM methods to analyze the data. Planned work includes analyzing any collected intersection data. It is likely that ODOT will not purchase SafetyAnalyst during this next biennium to do the analysis, but it is a possibility. It is likely that at some time in the future the department will purchase SafetyAnalyst from AASHTO to do network screening.

Fundamental Data Elements (FDEs)

FHWA published the Final Rule describing the Subset of MIRE data to be collected on public roads (MIRE FDE). A plan has been developed for collecting the MIRE FDE with the Asset Management Group at ODOT. ODOT will be analyzing collected data within the signalized intersection pilot to determine the usefulness of the data to perform network screening as well as perform systemic analysis for emphasis area crashes identified in the Transportation Safety Action Plan. This will likely be an ongoing project over many years, the plan sets out a ten year plan for collecting the MIRE FDE.

SPIS All Roads Update

ODOT intends to continue to use the Safety Priority Index System (SPIS) tool to identify and prioritize its most severe safety needs on all public Roads. This update will rewrite the SPIS system to only use Crashes that involve injuries and fatalities, eliminating the inclusion of Property Damage Only (PDO) crashes within SPIS. The advantage is that Crash Analysis and Reporting (CAR) Unit will code and quality check the fatal and injury crashes first within the Crash Database, hopefully allowing the SPIS to be run sooner in the year and allow Regions more time to investigate the top sites.

Although this is a loss of some data, the network screening appears to show very little impact on the selection of top sites due to the removal of PDO crashes. The CAR unit will still code the PDO crashes with a reduced set of details so all crashes will be available to an investigator looking to diagnose a particular location only the SPIS analysis will be available sooner.

5 OTHER SAFETY INITIATIVES

Other Safety Initiatives that don't fit well in the above categories are listed below. This list is not exhaustive and does not include all engineering safety initiatives carried forth by other parts of ODOT that also improve safety.

5.1 Summary of Accomplishments

Advocate for Continued support of Safety Funding for Systemic System Wide Improvements

In prior years the entire Safety Funding Program was regionally allocated to addressing high priority sites. Addressing needed Safety Improvements through funding systematic improvements serve as a very effective way to reduce fatal and serious injury crashes. ODOT committed half their safety funding to systemic low cost measures under the ARTS program.

Further discussion about systemic countermeasures may yield other areas of study for wrong way driving and older drivers and pedestrians as a couple of examples

Status: Ongoing

Rumble Strips

ODOT has been experimenting with different types of rumble strips for several years. As part of several initiatives the department installed variations of rumble strips, including centerline rumble strips in passing areas and rumble strips integral with the fog line. As part of the Roadway Departure initiative ODOT revisited the rumble strip policy in an effort to gain wider acceptance of the use of rumbles strips in Oregon.

Efforts to complete a final policy continue to be hampered, currently the Department is operating under an interim policy.

Trials with different rumble strips to make them quieter could yield updates to the policy, ODOT expects to have a finalized policy by 2018.

Status: 90% Complete

Safety Corridors

ODOT completed work on updating the safety corridor guidance and incorporating new selection criteria for safety corridors.. The new draft Safety Corridor Guidance is available but some parts of the guidance still need resolution, this is planned in 2017.

Status: 95% Complete

1R Pavement Preservation Program – Guardrail Replacement

ODOT has been working with FHWA to revise the program for guardrail upgrade and replacement within the 1R pavement preservation program and the criteria by which locations are chosen. Ongoing work will be necessary as the program moves from replacing outdated guardrail on the Interstates to NHS off interstate highways.

Status: Ongoing

Median Guardrail/Barrier Program

ODOT has been working to close medians of freeways with median guardrail or cable median guardrail or median concrete barrier. ODOT had chosen to close medians that were 100 feet or less width when the legislature mandated it. Work will likely continue but is expected to be completed in 2018.

Status: 90% complete

Ball Banking and Curve Sign Updates

ODOT has been working on updating curve warning signs with a new method of determining the advisory speeds. The completion of all State Highways is nearly done. Other qualifying public roads in Counties are ongoing and will be complete prior to the 2019 deadline. ODOT is funding data collection for the effort on County roads through the Traffic Records Coordinating Committee to be completed in 2017.

Status: Ongoing, required completion 2019

Posted Speeds

The legislature changed several statutory speeds during 2016 in central and eastern Oregon, on interstates and on non-interstate state highways. ODOT is monitoring the highways and will be evaluating the crashes after a few years.

Status: Ongoing

Speed Management Plan

ODOT participated in a process to develop a speed management safety implementation plan to address speed related crashes in Oregon focusing on speed related crashes as they applied the three Oregon Emphasis areas: Roadway Departure, Intersections and Pedestrian/Bicycle. The plan resulted in several recommended strategies/opportunities for improving speed management policies and actions.

Status: Complete

Updated Transportation Safety Action Plan

ODOT began a process to update the current Strategic Highway Safety Plan, in Oregon that plan is called the Transportation Safety Action Plan. The plan was completed in 2016 and adopted by the Oregon Transportation Commission.

Distracted Driving Task Force

The Oregon Transportation Commission organized a distracted driving task force to find way to curb distracted driving. The Task force will produce a final report in 2017.

5.2 Summary of Planned Activities

Speed Management Plan

ODOT will participate in a process to develop a speed management safety implementation plan to address speed related crashes in Oregon.

Safety Tracking Mechanism

ODOT would like to develop a Safety Tracking mechanism/database to enable tracking of safety projects. The mechanism should enable to ODOT to better evaluate the effectiveness of the Safety projects.

Safety Implementation Plans on GIS

Work with Transportation Data Section to incorporate systemic safety implementation plans (Roadway Departure, Intersections and Bike/Ped) into TransGIS to make the results more accessible to users when scoping projects.

Safety Investigation Manual (SIM) Worksheets

Update SIM worksheets with more recent crash data to account for any changes to crash trends. The SIM uses Highway Safety Manual Methods to determine crash trends and proportions of crash types.

6 THE FUTURE

The efforts to integrate the Highway Safety Manual into ODOT might greatly change the direction of the ODOT PSMS in the future likely to lead to a more objective approach to safety and more effective and reliable tools. This effort requires the collection of a lot of data first, at a minimum the MIRE FDEs.

ODOT's PSMS is committed to improving the data driven process included in the safety analysis of roadways in Oregon by improving the crash data access and also roadway inventory data. The PSMS should provide better trend analysis by summarizing the data in useful and intuitive ways. An additional component of the process will be to incorporate better evaluation tools, for evaluation of projects, policies, and countermeasures.

Significant challenges lie ahead for further improving highway safety in Oregon. The fatality rate was declining over the past decade, but annual decreases were not large. In 2015 and 2016 Oregon experienced a large increase in fatalities, most states in the nation experienced the same increase, levels that had not been seen for a decade. It is still unclear what caused the spike. Much of it was blamed on distracted driving.

Several municipalities are also getting on board with the Vision Zero efforts, with a focused approach to develop policies for Safe Streets. While a continued focus on infrastructure improvements is necessary the expansion of the programs to change the culture towards safe drivers is a necessity. Vision Zero efforts also challenge engineers to rethink design policies.