



Project Safety Management System (PSMS)

Biennial Status Report 2014



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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) continues 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.

MAP-21 HSIP emphasizes a data-driven, strategic approach to improving safety on all public roads that focuses on performance. Each State is required to have to identify key safety problems, establish their relative severity, and then adopt strategic and performance-based goals to maximize safety. Every State is required to develop a Strategic Highway Safety Plan (SHSP) that lays out strategies to address these key safety problems. Every State now has an SHSP in place, and MAP-21 ensures ongoing progress toward achieving safety targets by requiring regular plan updates. The SHSP remains a statewide coordinated plan developed in cooperation with a broad range of multidisciplinary stakeholders.

Development of safety performance measures will likely occur in 2016, FHWA is in the process of adopting the new rules. States will set targets for the number and rate of serious injuries and fatalities. Also new rules governing HSIP reporting are likely to be adopted in 2016.

Other special features of MAP-21 include that a State is required to obligate funds for this purpose if the fatality rate on high risk rural roads increases. States are 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 2013 and 2014. Each of the items is detailed in the corresponding sections of the report.

A key accomplishment completed this biennium but started last biennium was to finish development of the All Roads Safety Priority Index System (SPIS). Read more about SPIS below under "Network Screening". Another key accomplishment was to develop and begin implementation of the All Roads Transportation Safety (ARTS) program. Advocating for addressing safety on all roads and also using systemic measures has paid off. The program began with a transition program to allow funding to start flowing to local agencies for some low cost systemic improvement projects from 2014-2016. The ARTS program follows with funding allocated for all public roads between 2017 and 2021. The ARTS program consists of a mixture of hot spot projects and systemic projects. The ARTS program is focused on implementing a program to address safety on all Oregon public roads. 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.

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:

Developing Safety Performance Measures for Roundabouts

Effective Measures to Restrict Left Turn Movements

Improved Safety Performance Functions for Signalized Intersections

Improved Pedestrian Safety at Signalized Intersections Operating the Flashing Yellow Arrow

Pooled Fund Study of HSM Implementation

Safety Corridor Program Evaluation

Validation of Models for Quantifying Safety Performance of Driveways on State Highways

Developing Safety Performance Measures for Roundabout Applications in the State of Oregon

Current Research:

Implementing Safe and Effective Speed Reduction for Specific Freeway Work Zones

Detection Optimization Methods at Traffic Signals

Risk Factors Associated with High Potential for Serious Crashes

Smart Red Clearance Extensions to Reduce Red Light Running Crashes

Evaluation of Variable Speed Limits

Operational Guidance for Bicycle Specific Traffic Signals in the US

Developing Systemic Safety Analysis Tool for Pedestrians (NCHRP)

Safety Effectiveness of Pedestrian Crossing Enhancements

Evaluation of Weather Based Variable Speed Limit Systems

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

Work with Crash Data Unit to implement a new Collision diagramming tool (Crash Magic) based on earlier evaluation. This tool is still not complete but data improvements are being made.

Status: 99% complete

Note: Data improvements took considerably longer than anticipated and the new product is expect to be released in 2015

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.

Since roadway departure severe crashes are such a high percentage of the traffic safety problem in Oregon, a significant impact on this crash type will make a big difference in the overall number of fatalities and incapacitating injuries in the State.

Information on the Roadway Departure Safety Implementation Plan is available on the Traffic-Roadway website at:

http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/roadway_departure.shtml

Implementation of this plan started in 2012 when funding was made available through 164 penalty funds, projects are still being funded.

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 begins with 2016 STIP on State Highways and then on all 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 begins 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 professional 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 synthesizes 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

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 Moratorium and Research

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.

Status 100% complete

Revise Benefit Cost worksheet for ARTS

Updated ODOT benefit-cost worksheet for analyzing benefit of safety projects for ARTS. Incorporated HSM Predicted Method for Pedestrian and Bicycle analysis of cost effectiveness.

Status 100% complete

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 to investigate Data Requirements for Highway Safety Manual

Continue defining data needs for HSM methods, including analyzing FHWA requirements for a subset of MIRE data elements to be collected.

Status: Ongoing

Improve Crash Graphing Tools

ODOT completed an update to the crash graphing tools (Crash Decoder) to enable crash reports to create crash summary/graphs using Microsoft Excel macros for both state highways and local agency roads. The program uses an excel extract of a report created for Crash Reporting and creates various graphs of crash trends so analysts can quickly identify trends.

Status: Complete

Improve the OASIS Tool

ODOT added several new fields in the OASIS program under the “Special Conditions” heading, “Roadway Departure Involved”, “Intersection Involved”, “Curved Involved”, and “Signalized Involved” to make the program more useful.

Status: Complete

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.

Status: 80% Complete

2.2 Summary of Planned Activities

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

Continue research in the following:

- Risk Factors for Pedestrian and Bicycle Crashes

- Effective Methods to Restrict Turn Movements

- Profiled Durable Edgeline Pavement Markings as a Substitute for Shoulder Rumble Strips

Other possible research includes:

- Best Safety Analysis Practices for Geospatial/GIS

- Impact of Flashing Yellow Left Turn Arrow Signal Operations on Pedestrians

- Data collection for Pedestrian and Bicycle Volumes

- 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

- Safety Evaluation Study with Video of Oregon’s Flashing Yellow Arrow Left Turn conflict with Pedestrian Overlap Phase

- Evaluation and Implementation Plan on How to Improve ODOT’s Process for Removing Trees in the Fill Slopes

- 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

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. This previous plan is in need of updating with new data.

Update Intersection Safety Implementation Plan

Following up on the Roadway Departure Safety implementation Plan, Oregon developed a plan for reducing Intersection Crashes in 2012. 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. The previous plan is now in need of updating.

Develop an Older Driver Safety Implementation Plan

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

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.

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.

Development of GIS tools for Analysis

ODOT will be working 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.

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.

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 three components, Highway Safety Improvement Projects, Highway Grade Rail Crossing (HGRX) Safety Projects, and the High Risk Rural Roads (HRRR) Projects. Highway Grade Rail Crossing Safety activities are reported by ODOT Rail Division and are not included in this report. HRRR is being phased out in MAP-21. 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 increases the amount of HSIP funds available to states. ODOT has designated the increases to go for Intersections and Ped/Bike Safety starting in 2016. Meanwhile ODOT is also giving additional funds to safety for local agency roads, in anticipation of moving towards an All Roads Transportation Safety (ARTS) program.

3.1 Summary of Accomplishments

Highway Safety Improvement Program (HSIP) Report

These reports detail ODOT's HSIP accomplishments for the fiscal years 2013 and 2014. 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 should get underway between 2014 and 2016.

Status: 50% Complete

Highway Safety Program (or All Roads Transportation Safety)

The All Roads Transportation Safety (ARTS) Program is a safety program to address safety needs on all public roads in Oregon. 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 will be rewritten. .

Status: 80% Complete

Systemic Safety Program

The development of systemic safety is a notable change from the past. The different 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 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.

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 Planned 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

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 will continue to be used to support the systemic measures within ARTS.

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.

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.

With the requirement for performance measurements in MAP-21, ODOT has been waiting to implement new measures.

Status: 60% Complete

3.2 Summary of Planned Activities

Training

Additional Safety Training for Local Agencies

Systemic Measures Training

Additional Highway Safety Manual training

Human Factors Training

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. Possibly implement the new online HSIP reporting offered by FHWA.

Older Driver Program (special rule in MAP 21)

Analyze data for Older Driver Special rule in MAP-21 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.

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

2013 and 2014 SPIS Reports Published

The SPIS reports are generated and distributed to Regions for investigation about mid year each year.

Below is summary for the last seven 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
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

Status: 100% Complete

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.

Status: 100% Complete

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.

Two obstacles existed, the linear referencing system used by cities and counties make it difficult to use the current SPIS methodology and insufficient data on the traffic volumes on local roads do not allow crash rates to be determined. To expand the SPIS to include local agency roads (city and county roads) requires more data on the local road system, including traffic volumes and a common referencing system similar to either a mileposting system or a geographic information system (GIS).

Developments in GIS lead us to use GIS to calculate SPIS statewide. First, all crash data, beginning in 2007, has been geocoded with latitudes and longitudes. Second, an effort to map road information including volumes to all functionally classed roads in Oregon to GIS was completed (OR-Trans). Together these two developments formed the basis of developing a statewide method for expanding SPIS to the local road system.

Status: 100% complete

Oregon Adjustable Safety Index System (OASIS)

As part of the new SPIS All Roads Project, OASIS is being 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. Status: 100% 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.

Fundamental Data Elements (FDEs)

MAP-21 requires the Secretary of Transportation to adopt fundamental data elements. In 2014 FHWA published a notice of Proposed Rulemaking proposing to adopt these FDEs. ODOT will be developing a plan and analyzing the required data elements necessary to comply with MAP-21 to provide useful data to perform network screening as well as perform systemic analysis for emphasis area crashes identified in the Transportation Safety Action Plan.

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, such as cable median barrier for crossover crashes, upgrading guardrail/concrete barrier ends, rumble strip installations, upgrading roadside areas, corridor planning, pedestrian safety programs, bike safety programs, rail crossing safety programs and operations and modernization projects that also improve safety.

5.1 Summary of Accomplishments

Advocate for increased 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 an additional way to reduce fatal and serious injury crashes. ODOT committed half their safety funding to systemic low cost measures under the ARTS program.

Status: Complete

Advocate for additional funds to address local agency safety needs

Currently half of Oregon's fatalities happen on local roads, two thirds on County roads and one third on city streets. Part of the problem though is it is spread out over ten times the mileage of the State Road System. Applying Safety dollars to that sporadic of crashes and having a significant impact requires good planning and excellent use of resources. ODOT committed funds to the All Roads Transportation Safety (ARTS) Program which includes local city streets and county roads.

Status: Complete (see ARTS program above)

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 will be revisiting their rumble strip policy in an effort to gain wider acceptance of the use of rumbles strips in Oregon.

Efforts to complete a final policy were hampered, the Department is continuing to try to finalize a policy.

Status: 80% Complete

Safety Corridors

ODOT has begun a process to update safety corridor guidance incorporating improving the selection criteria of safety corridors and other improvements.

Status: 80% 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

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.

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. Although the fatality rate has continued to decline over the past decade, the annual decreases have not been as great in recent years. Without continued focused investment, there is the potential for increased fatalities as a result of expected growth in vehicle miles traveled. In addition to future needs, there is a backlog of current identified problems.

Systemic approaches to safety improvement will greatly improve progress towards reducing fatal and serious injury crashes in Oregon. The measures are very cost effective.