

Oregon Department of Transportation



Project Safety Management System (PSMS)

Biennial Report 2006



OREGON DEPARTMENT of TRANSPORTATION
TECHNICAL SERVICES
TRAFFIC-ROADWAY SECTION
<http://www.odot.state.or.us/tstrafmgtpublic>

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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).

SAFETEA-LU further requires all states to develop a Strategic Highway Safety Plan (SHSP) and identify a strategic approach to addressing the states most severe safety concerns. In addition SAFETEA-LU requires states to submit an annual report to FHWA describing not less than 5% of their highway locations exhibiting the most severe safety needs, potential remedies to the hazardous locations, estimated costs of the remedies and any impediments to implementation of the remedies (other than cost).

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. Each of the items is detailed in the corresponding sections of the report.

TABLE FOR SECTION 2 - SUMMARY OF PSMS ACTIVITIES

Accomplishments in 2005 & 2006
<ul style="list-style-type: none">• Intergovernmental Agreements with PSU and OSU
<ul style="list-style-type: none">• Partnership between Traffic Roadway Section and Transportation Safety
<ul style="list-style-type: none">• Development of PSMS Project Status Report
<ul style="list-style-type: none">• Update of Transportation Safety Action Plan with Engineering Emphasis Areas to satisfy SAFETEA-LU requirements
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TABLE FOR SECTION 3 - HIGHWAY SAFETY IMPROVEMENT PROGRAM

Accomplishments in 2005 & 2006
<ul style="list-style-type: none"> Highway Safety Improvement Program (HSIP) Report
<ul style="list-style-type: none"> Highway Safety Project Guide
<ul style="list-style-type: none"> Statewide Transportation Improvement Program (STIP) – Safety Summary
<ul style="list-style-type: none"> Crash Reduction Factors Research
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<ul style="list-style-type: none"> Crash Summary Database
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TABLE FOR SECTION 4 - SAFETY PRIORITY INDEX SYSTEM

Accomplishments in 2005 & 2006
<ul style="list-style-type: none"> Rewrite of Safety Priority Index System (SPIS) with extended functionality
<ul style="list-style-type: none"> 2005 and 2006 SPIS Reports published
<ul style="list-style-type: none"> Prototype of SPIS Analysis Module (SAM)
<ul style="list-style-type: none"> FHWA required Top 5% report based on SPIS

TABLE FOR SECTION 5 - OTHER SAFETY INITIATIVES

Accomplishments in 2005 & 2006
<ul style="list-style-type: none"> Lead State Initiative – Lane Departure Crashes Report
<ul style="list-style-type: none"> Lead State Initiative – Lane Departure Projects
<ul style="list-style-type: none"> Repeat Offender Transfer Provision- Section 164 Penalty Funds
<ul style="list-style-type: none"> Speed Monitoring
<ul style="list-style-type: none"> Develop Legislative Concepts
<ul style="list-style-type: none"> Rumble Strip Experimentation

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 PSMS will help reduce the traffic fatality rate in Oregon from the 2003 rate of 1.36 fatalities per 100 million vehicle miles traveled, to the goal in our Oregon Transportation Plan of 0.99 by the year 2010. 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

Intergovernmental Agreements with PSU and OSU

Traffic-Roadway was instructed to utilize more contracts as necessary to complete safety program work. As a result, Intergovernmental Agreements with Portland State University and Oregon State University were executed. These research efforts assist ODOT's Traffic-Roadway Section in research and completion of safety goals.

Status: Ongoing

Completed Research:

Update and Enhancement to the Oregon DOT's Crash Reduction Factors

Understanding the Safety Effects of Roadway Illumination Reductions

Literature Review for Safety Investigation Manual

Current Research:

Safety Investigation Manual (phase 2)

Evaluation of the Effectiveness of the Safety Investment Program

Determining Optimum Safety Countermeasures for Speed Related Crashes

Partnership between Traffic Roadway Section and Transportation Safety

In March of 1999, a formal Safety Management System partnership between Traffic Engineering and Operations 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.

Status: Ongoing

Development of the PSMS Project Status Report

Originally the intent was to develop a business plan for improving and enhancing the Project Safety Management System. The plan gave way to a more active approach in the form of tracking current projects, the PSMS Project Status Report. This report outlines the activities engaged in by staff, to improve or administer the PSMS. Many of the longer term goals and objectives originally intended for the business plan were incorporated in the ODOT Transportation Safety Action Plan.

The report outlines the activities and priorities as approved by ODOT's Highway Safety Engineering Committee.

Status: Ongoing

Update of Transportation Safety Action Plan with Engineering Emphasis Areas to satisfy SAFETEA-LU requirements and Action Items for PSMS

The update of Oregon's Transportation Safety Action Plan (TSAP) was initiated by the new SAFETEA-LU legislation passed by Congress. The 2004 Transportation Safety Action Plan (TSAP) was prepared with the knowledge that SAFETEA-LU would contain a requirement that states develop a Strategic Highway Safety Plan (SHSP). At the time of the TSAP's development, the final form of that legislation was still pending.

In order to meet all the requirements defined for a SHSP in SAFETEA-LU and federal guidance, ODOT amended the 2004 TSAP to further address actions (key emphasis areas and strategies) relating to engineering elements, as identified in SAFETEA-LU, and federal staff guidance.

Key Safety Emphasis Areas included in the TSAP are:

- Rural Non-Signalized Intersection Crashes - Investigate the usefulness and impact of advance signing, transverse rumble strips and other devices as countermeasures for rural non-signalized intersection crashes.
- High Speed Signalized Intersection Crashes – Investigate the usefulness and impact of advance signing, dilemma zone protection through advance detection technologies and other countermeasures for high speed signalized intersection crashes on highways with posted speeds of 45 MPH or greater.
- Lane Departure Crashes (Lane departure crashes include run off the road crashes and head-on crashes) - Investigate the usefulness of rumble strips, shoulder widening, median widening, cable barrier, durable marking, fixed object removal, roadside improvements and other countermeasures and safety treatments of centerline and shoulder areas for lane departure crashes.
- Pedestrian Crashes - Investigate the usefulness of curb bulb-outs, refuge islands, warning signage improvements and other countermeasures for pedestrian crashes.

Status: Complete

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 was 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

2.2 Summary of Planned Activities

PSU/OSU Intergovernmental Agreement

Continue research in the following:

Safety Investigation Manual (phase 2)

Evaluation of the Effectiveness of the Safety Investment Program

Determining Optimum Safety Countermeasures for Speed Related Crashes

Other possible research includes:

Safety of High Speed Signalized Intersections

Safety Performance Functions (SPF) for Oregon Roads

Assessment of Statewide Intersection Safety Performance

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 two sources, the Highway Safety Improvement Program (HSIP) and the Safety Investment Program (SIP).

The *Highway Safety Improvement Program (HSIP)* is a federally funded program that mandates each state systematically survey all highways to identify hazardous locations, segment and elements. 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 to FHWA by ODOT Rail Division. They are not included in this report.

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. The HRRR are exclusively for rural roads and primarily used on county roads. Agencies may submit applications for HRRR project funding to the ODOT Local Agency program office.

The *Safety Investment Program (SIP)* is a process to selectively make safety investments on roadways with a history of fatal and serious injury crashes. The goal of SIP is to create a balance to meet the competing needs of two important transportation facility elements – safety and pavement preservation; and to provide the most cost effective means of reducing fatalities and severe injuries on safety projects.

Five mile sections of the state highway system are categorized by the number of fatal and severe crashes during a three period. The following is the stratification for SIP categories:

Category 1: 0 (no) fatal or injury A (serious) crashes;

Category 2: 1 to 2 fatal or injury A crashes;

Category 3: 3 to 5 fatal or injury A crashes;

Category 4: 6 to 9 fatal or injury A crashes;

Category 5: 10 or more fatal or injury A crashes.

3.1 Summary of Accomplishments

Highway Safety Improvement Program (HSIP) Report

These reports detail ODOT's accomplishments for the fiscal years 2005 and 2006. The reports summarize the both the HSIP and HRRR activities for the previous year. The reports document the progress being made to implement safety improvements and the effectiveness of such projects.

Status: Complete

Highway Safety Project Guide

A new program guide is nearly complete with some additional criteria outlined by SAFETEA-LU and also a recommendation from the Highway Safety Engineering Committee that the Department adopt the guidelines not just for HSIP funded projects but for all safety projects. This is a departure from previous practice where only the federally funded HEP projects must meet the guidance. Formerly the HEP projects had to meet the requirement of a benefit cost ratio of greater than 1.0 to be eligible for HEP funding.

The SAFETEA-LU legislation expanded the criteria for eligibility of the HSIP funds, but also calls for a higher degree of data use in determining the priority of projects and the project selection process. Also the new legislation calls for an emphasis on fatal and serious injury crashes. Oregon's use of SPIS has traditionally placed a high emphasis on the more serious crashes and includes a component of severity in the calculations.

SAFETEA-LU significantly increased the federal HSIP funds available for ODOT's Safety Program. This did not increase the amount of safety funds for safety projects, but it did increase the percentage of safety funds that are federal funded. Previously HEP accounted for about 10% and SIP accounted for 90% of the Safety program funds (SIP was either state funds or other eligible federal funds). The new HSIP funds account for over half of ODOT's Safety Program. With the additional penalty funds from Section 164, currently ODOT's Safety Program is about 75% federal funds that are required to meet HSIP eligibility.

As a result of the significantly higher portion of federal safety funding the new guidance requires all safety projects programmed in the STIP, whether using federal funds or not, to meet the eligibility criteria. This results in a "higher bar" being set for all safety projects. Formerly a positive benefit cost ratio was the primary criteria ODOT used for federal HSIP funding of safety projects. Sometimes where a safety need was identified a positive benefit cost ratio was not attainable, so additional criteria was included. In addition to the positive benefit cost ratio a top 5% SPIS site or a Category 3, 4, or 5 SIP segment may justify expenditure of safety funds.

Details of how to handle currently programmed STIP projects (2006- 2011), during the transition need to still be worked out, since many of the current STIP safety projects were programmed before the additional criteria were set, it is not known how many of the projects meet the new requirements. This seems to be a self imposed problem, since neither the legislation, nor FHWA, requires the additional criteria (i.e., benefit cost or top 5%). See: http://www.oregon.gov/ODOT/HWY/TRAFFIC-ROADWAY/highway_safety_program.shtml for a copy of the draft guidelines.

Status: 80% Complete

Statewide Transportation Improvement Program (STIP) – SAFETY Summary

As of February 2007, just over \$51 million was programmed for construction of safety projects (primarily infrastructure improvements) over the 2 year period 2006-2007, compared to just over \$43 million the previous two years. This total does not include preliminary engineering, right-of-way, non-safety construction costs, Traffic Safety Grants, Rail Crossing projects or local safety projects. A summary is shown in the table below.

STIP Actuals (\$ in Thousands) – HSIP and Other

Region	2006	2007
1	\$11,153	\$14,709
2	\$8,762	\$5,796
3	\$2,544	\$2,001
4	\$1,161	\$3,143
5	\$939	\$969
Total	\$24,559	\$26,618

For the 2008-2011 STIP, categories were added for High Risk Rural Roads and Safe Routes to School by SAFETEA-LU. The OTC approved significantly more funds to the Highway Safety Limitation than provided by federal funding alone. HSIP is approximately \$14.5 million per year with the additional \$14 to \$15.4 million made up of other eligible federal and state funds.

STIP Targets approved by OTC (\$ in Millions)

	2008	2009	2010	2011
<i>Highway SAFETY (HSIP and other)</i>	\$26,500	\$27,600	\$26,600	\$27,800
High Risk Rural Roads	\$1,100	\$1,100	\$1,200	\$1,200
Safe Routes to Schools	\$900	\$900	\$900	\$900
Safety Total	\$28,500	\$29,600	\$28,700	\$29,900

Status: Ongoing

Crash Reduction Factors Research

Accurate crash reduction factors (CRF) are critical to 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. Since the original development of Oregon DOT's CRF list, there have been significant improvements to evaluate the effectiveness of engineering countermeasures which has produced a wealth of new published research. There is a clear need to validate ODOT's crash reduction factors using this work and incorporate new countermeasures into the list.

The primary objective of this research is to provide an updated, comprehensive list of crash reduction factors for ODOT engineers. This will improve the chances of selecting the best safety improvement countermeasure and enhancing project development for the funding provided. A secondary objective is to document key

aspects of the CRFs so engineers will be better informed when selecting the appropriate countermeasures. See: <http://its.pdx.edu/CRF/crf.php>

Status: 100% Complete

Crash Graphing tool

In 2003 Traffic Engineering and Operations first developed an Excel Add-in program to assist traffic engineers and highway designers in identifying crash trends and characteristics. The Crash data rewrite project required this tool be rewritten to fit into the ODOT Transviewer format.

Status: 100% complete

Crash Summary Database

The Crash Summary Database is a tool for producing a fast, brief compilation of crash data which includes an estimate for traffic volume, an estimate for crash rate and a SPIS* value if applicable. The program was updated to be compatible with the new Crash Database rewrite.

Status: 100% complete

Training Provided

Oregon Transportation Safety Conference;

FHWA Training on new tools: Safety ANALYST

ODOT Staff training - PSMS tools: SPIS, SAM

Safety Investigators User Group (provided input and training to individuals)

32nd International Traffic Records Forum

Development 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, SIP projects, pavement condition, ADT and other data. Additional tools and elements are being developed by ODOT GIS Group. Most recently all TransGIS pages contain imagery (air photos or relief maps).

Status: Ongoing

Development of Tool to Geocode Crash data

ODOT GIS completed a prototype of a new tool that will allow Crash Data Unit staff to geocode all crash data with latitude and longitude for use with GIS maps. Beginning in April of 2007 the staff will begin coding all crashes with geocodes. In addition to helping locate the crash with better precision the geocode will allow local agencies to receive the data with geocodes already established for the first time. Along with other methods to geocode all public roads in Oregon this will provide a powerful tool for locals to analyze and locate their crash data

Status: 90% complete

3.2 Summary of Planned Activities

Training

Developing a course in Safety Investigations by OSU/PSU

Human Factors Course

Training on the New Highway Safety Manual scheduled to be distributed in 2008

Roadside Safety Audits (RSA) training planned for fall 2007

HSIP Reports

Improve the HSIP reports, with more comprehensive reporting, including all Safety Projects not just those funded with HSIP funds. Develop better evaluation tools and better tracking of the projects, through the new project delivery tools being developed.

Crash Reduction Factors

Update ODOT Crash Reduction factors based on PSU research, include new national efforts by NCHRP and extend the Crash Reduction factors to cover all 4E's. Develop a usable tool or report form for ODOT employees that can also be used by local agencies for understanding the applicability of countermeasures to particular crash types and inherent limitations.

Status: 10% complete

Benefit Cost Worksheet and Economic factors

Update ODOT's Benefit Cost worksheet with new crash reduction factors and include updated economic factors for the costs of crashes

Collision Diagramming

Work with Crash Data Unit to improve the Collision diagramming tool either improve the current tool (Crash Viewer) or purchase a new tool.

Safety Scoping Tool

Develop some simple GIS tools for locals to work with geocoded crashes, evaluate their systems and plot crash maps by crash types, severity or other. AASHTO has a proposal to develop free software in GIS to produce simple analysis and provide extended capability for GIS based data for locals.

4 SAFETY PRIORITY INDEX SYSTEM (SPIS)

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

Rewrite of Safety Priority Index System (SPIS) with extended functionality

With the rewrite of ODOT's Crash Data System the SPIS Program needed to be rewritten. The new program produces new reports that previously were generated by hand, reducing potential manmade errors in the data. The program has two primary data sources, the crash record system and the ITIS highway inventory files. Following the SPIS rewrite project, the program automatically generates most of the reports for evaluating and analyzing locations statewide. Enhancements to the system allowed more incorporation of roadway features inventory data in the reports.

Status: Complete

2005 and 2006 SPIS Reports Published

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

In 2006 there were total of 4,953 sites on this year's top 10% SPIS site list. Below is summary for the last five years.

Oregon Department of Transportation
2006 Safety Priority Index System
5 Year History Summary

Year	# Top 10% Sites	# Repeat Sites	# New Sites	Cutoff SPIS Value
2006	4,953	3,420	1,533 (27%)	45.49
2005	5,038	3,679	1,359 (29%)	43.91
2004	5,154	3,655	1,499 (29%)	44.49
2003	5,113	3,632	1,481 (29%)	45.03
2002	5,162	3,729	1,433 (28%)	45.47

Status: 100% Complete

Prototype of SPIS Analysis Module (SAM)

In conjunction with the SPIS rewrite project, a new type of tool was developed. The SPIS Analysis Module or SAM, is a take off of the SPIS program, using the same calculations as SPIS, but allows for constrained and varied analysis of State Highways. Using the same routines SAM can vary the length of the analysis from 0.10 miles to 5 mile segments. Also the analysis can be constrained to include only certain collision types, roadway types, and weather conditions. The program is limited to the data in the roadway inventory files. Currently the prototype allows only a handful of important elements.

When complete the program will be helpful with identifying potential segments, strategic application of countermeasures, or areas of particular concern such as lane departure crashes.

Status: Prototype, 50% complete

FHWA required Top 5% report based on SPIS

As part of the new HSIP, states are required to submit an annual report describing not less than 5 percent of their highway locations exhibiting the most severe safety needs. The intent of this provision is to raise public awareness of the highway safety needs and challenges in the states.

ODOT uses our Safety Priority Index System (SPIS) tool to identify and prioritize its most severe safety needs. In addition, to the listing of top 5% SPIS sites, the report also includes:

- Potential remedies to the hazardous locations identified;
- Estimated costs of the remedies; and
- Impediments to implementation of the remedies other than costs.

Eventually this report will include all public roads in Oregon, including City and County roads (this will be accomplished before August 31, 2009). Currently ODOT's systems do not allow the same ranking system for County and City roads. To accommodate a statewide listing of severe safety needs either the roadway inventory system will be upgraded to allow the inclusion of all public roads or another system will be adopted for these other roads. ODOT is currently exploring which approach to take.

Potential remedies may be in any, or a combination, of the "4 E" areas (engineering, enforcement, education, and emergency medical services). Detailed improvement remedies and costs may not be available for all locations. For those locations where no studies were performed, the Region Traffic Offices made their best estimate of potential remedies and costs using their experience, statewide average costs, or other available means, including consulting with the Transportation Safety Division staff for possible behavioral safety programs. The remedies and costs were also presented as typical remedies and costs grouped by roadway or improvement types. It is recognized (and expected) that details and costs of proposed improvements will change during formal project development.

Among the new requirements of SAFETEA-LU is a deadline for reporting the top 5% by August 31st of each year. Previously we had until the end of the calendar year to perform investigations of the sites. In 2006 when the reporting requirement took effect, ODOT was in the middle of rewriting their crash data system and recoding SPIS. This resulted in a delay of getting crash data to the region offices until mid-summer. Additional requirements of SAFETEA-LU include estimated costs to address sites and a list of impediments. In spite of the delays and some incomplete information ODOT region staff worked hard to complete most of the investigations and report on the top 5%.

Status: Complete

4.2 Summary of Planned Activities

Enhanced Top 5% reports

Currently ODOT uses our Safety Priority Index System (SPIS) tool to identify and prioritize its most severe safety needs. In August of 2009 this report will need to include all public roads in Oregon, including City and County roads.

Two obstacles exist, 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 believe that GIS is the answer to calculate SPIS statewide. First, all crash data, including local road systems crashes, will be geocoded with latitudes and longitudes, beginning in April of 2007. Second, an effort to map road information including volumes to all local roads in Oregon to GIS is underway (OR-Trans). Together these two developments form the basis of developing a statewide method for expanding SPIS to the local road system.

SPIS Analysis Module (SAM)

Continue to develop and enhance SAM, integrating more roadway data and as more asset management data becomes available include enhanced features and extend report capability.

Highway Safety Manual

Investigate how to incorporate concepts from the new Highway Safety Manual (expected in 2008) into Safety project selection and SPIS.

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 guardrail for crossover crashes, upgrading guardrail/concrete barrier ends, 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

Lead State Initiative – Lane Departure Crashes Report

This initiative examined the two elements, run-of-road (ROR) and head-on non-freeway crashes. It is to be noted that ROR crashes also includes opposing flow sideswipe crashes.

The report analyzed several aspects of the problem, identified problem areas (e.g. fixed object crashes), summarized major concerns, developed performance measures to use as a goal, and developed recommended actions/strategies for the department to reduce the occurrence and severity of lane departure crashes.

Status: Complete

Lead State Initiative – Lane Departure Projects

Phase II of the initiative was to use allocate use of funds to provide funding for Safety projects to address some high crash corridors with the objective to reduce fatalities

and serious injuries related to lane departure crashes. The project selection was overseen by the Highway Safety Engineering Committee (HSEC) and about 6 million dollars of 164 penalty funds were used to fund the projects. An evaluation on the effectiveness will be completed after three years of crash data are accumulated.

Status: In progress (5 of 14 projects constructed during 2006 construction season; 8 more go to construction in 2007; 1 goes to construction in 2008)

Repeat Offender Transfer Provision – Section 164 Penalty Funds

Oregon was assessed a penalty transfer of its federal construction funds as a result of failing to enact legislation covering all five points relating to Repeat DUII offenders. Penalty for non-compliance is currently 3.0 percent of the NHS Surface Transportation Program (STP) and Interstate Maintenance Funds annually. The funds are transferred to the state's 402 Program, State and Community Highway Safety Grant Program. These funds are eligible for use to fund either impaired driving programs or be granted to the Section 148, Highway Safety Improvement Program (HSIP).

Last year the funds were used to fund safety projects programmed on the STIP, (prior to last year the funds were used to supplement the safety program funds). For the foreseeable future these funds will be used to provide funding for STIP safety projects eligible for funding.

Status: Ongoing

Speed Monitoring

The Traffic-Roadway Section (TRS) monitors speeds on Oregon Highways through a series of speed monitoring stations. The 27 stations throughout the state are maintained by the Traffic Monitoring Unit of the Transportation Development Branch for collecting volumes and speeds. The speed data is analyzed and summarized by Traffic-Roadway Section staff quarterly during the year. Results are used for research, reports and informational requests.

Status: Ongoing

Legislative Concepts

Traffic-Roadway Section staff worked with Transportation Safety Division staff and other ODOT staff to propose several legislative concepts to the 2007 legislature, including such concepts as photo radar in work zones and defining the driver response to flashing yellow arrows in traffic signals (something that is being incorporated in many left turn signal displays). Other considered were revising u-turn laws to match surrounding states. These concepts did not make the cut for prefilming with the legislature, although later, the photo radar in work zones concept was submitted by a legislator.

Status: Completed

Rumble Strip Experimentation

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 highway projects ODOT has also been installing rumble strips in advance of stop signs on rural roads. ODOT has been monitoring the results and sharing results with other national efforts to summarize results of different rumble

strip applications. As a result we have modified our rumble strip criteria in the ODOT Traffic Manual to incorporate findings and give further guidance on placement. We are presently compiling results of several years experimentation to evaluate the effectiveness of the devices.

Status: Ongoing

5.2 Summary of Planned Activities

Advocate for increased Safety Funding for System wide Improvements or Emphasis Areas

Currently the entire Safety Funding Program is regionally allocated to addressing high priority sites. Addressing needed Safety Improvement through funding either systematic improvements or emphasis areas would serve as an additional way to reduce fatal and serious injury crashes.

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. By far lane departure crashes (run off the road crashes) in rural areas are the leading cause of fatal and serious injury. Followed by a distant second is intersection crashes.

Rumble Strip Experimentation

ODOT has been inventorying the locations of rumble strips and classifying the types. With the completion of this effort, past crash history will be collected and evaluated.

6 THE FUTURE

The Transportation Research Board (TRB) is sponsoring research projects to develop prediction models, analysis tools and guidance. These projects include the National Cooperative Highway Research Program (NCHRP) project 17-18, developing a series of guides to assist state and local agencies in reducing injuries and fatalities in targeted emphasis areas. The guides correspond to the emphasis areas outlined in the AASHTO Strategic Highway Safety Plan, each pertaining to specific types of highway crashes (e.g., run-off-road, head-on) or contributing factors (e.g., aggressive driving). See: <http://safety.transportation.org/guides.aspx> for more information.

In addition, TRB is sponsoring the development of the Highway Safety Manual (HSM), anticipated in late 2008. The HSM will incorporate safety prediction methods that will be able to quantify the safety effects of decisions made in planning, design, operations, and maintenance. It will serve a role for safety analysis similar to that which the Highway Capacity Manual (HCM) serves for traffic operational analysis. The HSM will be targeted to professionals on the front-line of daily decision making within state highway agencies, as well as cities, counties and Metropolitan Planning Organizations.

These efforts might greatly change the direction of the ODOT PSMS in the future likely to lead to a more proactive 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.