

ODOT HIGHWAY ENGINEERING SAFETY PROGRAM

ODOT Safety Management System

- Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 - required development of a Safety Management Systems (SMS) in each state
- National Highway Designation Act of 1995 made these systems optional
- ODOT continued development of an SMS due to its merits, termed "Project Safety Management Systems" (PSMS)

ODOT PSMS Elements

- PSMS consists of three major elements
 - Hazard Elimination Program (HEP)
 - Now replaced by Highway Safety Improvement Program (HSIP)
 - Safety Priority Index System (SPIS)
 - Being updated
 - Safety Investment Program (SIP)

Hazard Elimination Program (HEP)

- Replaced by Highway Safety Improvement Program (HSIP)

Objective: to carry out safety improvement projects to achieve a significant reduction in traffic fatalities and serious injuries.

Hazard Elimination Program (HEP) Steps (now HSIP)

- Identify potential safety improvement locations using SPIS & SIP
- Analyze safety countermeasures' effectiveness and costs
- Evaluate the benefit/cost ratio of the improvements
- Perform risk analysis on locations where currently accident experience is light

Safety Priority Index System (SPIS)

- Purpose: to identify potential safety problem locations on state highways
- Analysis: 0.1 mile segment stepped along in 0.01 mile increments

SPIS Formulation

- SPIS score based on 3 years of crash data considering:
 - crash frequency - weighted 25%
 - crash rate - weighted 25%
 - crash severity - weighted 50%

SPIS Analysis

- Traffic Engineering and Operations Section (ODOT) reports:
 - Top 10% ranked SPIS sites
 - For Region Manager review
 - Annual SPIS map with SIP categories for 5-mile segments

Current Status of SPIS

- SPIS rewrite to match crash relational database in C sharp language
- Major changes;
 - Regional traffic managers must report top 5% high crash locations
 - More detailed output will be provided
 - Program will group sites next to each other into one SPIS location rather than each 0.01 mile

Updated SPIS Output

- SPIS output increased:
 - Road name
 - City/county
 - Oregon route number
 - Number of crashes broken down into fatalities, injuries A, B & C, and PDO's

Current SPIS Output

- “SPIS update” not available yet
- 2005 SPIS run output available in a few weeks, when quality control testing is completed
- 2006 SPIS run output available in June

SPIS Versions

- ODOT plan to improve SPIS:
 - SPIS1 (current) – existing version of SPIS with current rewrite in C sharp
 - SPIS2 (future) – will allow:
 - Specification of variable segment lengths
 - Selection of particular crash types
 - SPIS3 (future) – GIS based SPIS which would work for cities and counties
 - Must have milepost system for city/county road networks
 - Must have volumes on road segments

Federal Mandate 2005 SAFETEA-LU Acts

- Federal requires identification of top 5% high crash locations in state
 - By 2009
 - Must include state, city, and county facilities
- SPIS3 could be used by Cities and Counties

Safety Investment Program (SIP)

- Three basic premises:
 - Most effective use of safety dollars improves locations of fatal and serious injury
 - Employ countermeasures that address most prevalent serious crash types to achieve the best benefit/cost ratio
 - Categories 3, 4, 5 sections with highest fatal and injury A experience are a priority

SIP Categories

- Crash data for most recent 3 years and 5 mile segments stratified in these categories:

Category	1 – 0	Fatal or injury A crashes
Category	2 – 1-2	Fatal or injury A crashes
Category	3 – 3-5	Fatal or injury A crashes
Category	4 – 6-9	Fatal or injury A crashes
Category	5 – 10 or more	Fatal or injury A crashes

SIP Projects

1. Stand-Alone Safety Projects

Identify and select projects based on benefit / cost analysis

- Category 5 segments – highest priority
- Identify as many safety projects of Category 3, 4 & 5 segments as possible

SIP Projects

2. Preservation Projects

- Category 1 & 2 segments are primarily “pave mainly”
- Mandatory corrections are made to geometric deficiencies, such as:
 - ADA / sidewalk ramps
 - Narrow bridges / deficient rails
 - Existing guardrails
 - (see Table 1 ODOT, PSMS Users Program Manual, p. 11)
- Low cost safety measures to correct geometric deficiencies should be considered:
 - Narrow lanes and/or shoulders
 - Steep sideslopes / roadside obstacles
 - Sharp horizontal curves
 - Poor sight distance at hill crest
 - Hazardous intersections
 - (see Table 2, PSMS Users Program Manual, p. 12)

SIP Tools

- Arc View Mapping
 - Displays SPIS sites and flags 5 mile roadway segments with their SIP category
- Countermeasure Analysis Tool (CAT)
 - The Countermeasure Analysis Tool is being discontinued by the ODOT Traffic Section due to program complexity and lack of users. An update excel B/C ratio spreadsheet with drop down menus of crash reduction factors will take its place.

Countermeasure Analysis Tool

- CAT utilizes
 - Existing crash data
 - Crash reduction factors
- To determine:
 - Benefit/cost ratios for various countermeasure solutions
- Originally:
 - Excel based
- Now:
 - On-line ODOT web page application

Updated Crash Reduction Factors

- Accurate CRFs are critical to determine the most cost-effective countermeasure
- Oregon DOT contracted PSU's Chris Monsere to update the CRFs
- Handouts
 - PSU/ODOT Crash Reduction Factors results
 - Amplified ODOT Crash Reduction Factors
 - PSU CRFs plus added quantified CRFs to replace judgment

Other ODOT Safety Activities

- Crash graph tool
- Highway safety engineering committee
- Safety investigation manual
- Illumination study

Crash Graph Tool

- Used to identify crash trends and characteristics
- May focus on specific factors:
 - Time of day
 - Type of crash
 - Road surface conditions
- Relies on internal ODOT crash reporting tool

Highway Safety Engineering Committee

- Objective
 - To provide leadership to strategize, coordinate and direct engineering-related highway safety activities for ODOT
- Safety management roles
 - Lead development and enhancement of a Strategic Highway Safety Engineering Plan
 - Lead efforts to develop and enhance the Project Safety Management System tools and program
 - Develop a strategy to evaluate the results of safety investments

Safety Investigation Manual

- Develop a manual for investigation of accidents and collection of accident related data
 - To be used by ODOT accident investigators
 - Joint project for ODOT and OSU with Prof. Karen Dixon

Illumination Study

- Evaluate the safety impacts and energy savings of reduced illumination at freeway interchanges
- Comparative study of safety experience vs. energy savings at interchanges with unaltered and reduced lighting
- Joint project for ODOT and PSU with Prof. Chris Monsere

Oregon Safety Funds

- City/county safety funds
 - Portions of Oregon's federal highway gas tax and highway trust funds are allocated directly to cities/counties
 - Safety funds for cities/counties come from these funds
- ODOT safety funds
 - HEP (i.e., HSIP) funds used on ODOT projects only
 - Regional traffic managers control funds in their regions

ODOT Crash Information

- SPIS numbers can be obtained by cities, counties and consultants
- ODOT regional traffic managers in each region control access
- Regional traffic managers also have more crash data than just SPIS numbers

ODOT Crash Data Access

- ODOT crash reporting tool currently available only to ODOT
- Access may be available to cities, counties and consultants through Region Traffic Office
- Oregon State Police using ODOT crash data and crash graphing tool to obtain information for special enforcement

Other Safety Funding Programs

- “High Risk Rural Roads”
 - \$1-million per year
 - Cooperative program between counties and state

Other Safety Funding Programs

- “Safe Routes to Schools”
 - \$1-million per year
 - Through OTSD, Julie Yipp, Program Coordinator

Other Safety Funding Programs

- “164 Penalty Funds,” NHTSA
 - Funds taken from Oregon by FHWA for non-conforming DUI regulations
 - Returned through NHTSA programs
 - Available for safety improvements