Highway Safety Manual

Implementation

(Current Status & Future Direction)

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What Is The Highway Safety Manual?

• Provides analytical tools for the objective evaluation of the safety performance of roadways and countermeasures

• Developed by AASHTO
What is the Highway Safety Manual?

• Part A – Introduction, Human Factors, and Fundamentals

• Part B – Roadway Safety Management Process
  • Network Screening
  • Diagnosis
  • Countermeasures
  • Economic Appraisal
  • Project Priority
  • Effectiveness Evaluation

• Part C – Predictive Method

• Part D – Crash Modification Factors
HSM Implementation

**STIC Initiative**

- Integrate HSM into PennDOT Project Development Processes (PDP)
- Goal – Begin utilization of HSM on all applicable projects with Safety Review submission by 7/1/2015
Integration Into PennDOT PDP

Where Can We Apply the HSM?

- Planning & Programming
- Preliminary Engineering
- Final Design
- Construction
- Operations & Maintenance

During any point of the PDP!
Why?

• Design Process Changes
  - Evaluate each project’s safety impact
  - Include Roadway Safety Assessment in place of preliminary and final safety review
  - Take closer look at Design Exceptions
PennDOT Implementation Status

- **2009**: HSM concept brought up at TESC – 2009 through 2012
- **2010**: Initial HSM training - 3 sessions, Districts & Consultants
- **2011**: Second series of HSM trainings
- **2012**: I-95 Innovation Project: Recommended Implementation, DEs Meeting Presentation
  - May – State Transportation Innovation Council (STIC )
  - Sept – Roadway Data Improvement Project Discussion
  - Winter – STIC Deployment Plan
PennDOT Implementation Status

- **2013**
  - Funding leverage – IDEA Form Submission for SPF’s and CMF’s
  - Development of SPFs for Rural Two-Lane Roadways, CMF Guide Initiated (PennState)
  - PennDOT Design Manuals Updates Initiated

- **2014**
  - Development of PennDOT HSM Analysis Tools
  - District Pilot Project(s)
  - SPFs, CMF Guide, Design Manual Updates Finalized
  - Improve Roadway Data Initiated (RMS)

- **2015+**
  - PennDOT HSM Tool Training
  - SPF Development for Additional Site Types
  - Implementation- SafetyAnalyst (SA) Software
PennDOT Manual Updates

- Updates incorporate HSM into PennDOT’s PDP and design processes
  - Quantitative safety analysis and review included as part of PMC review for all projects
  - Updates road safety audit/assessment process
  - Incorporates new HSM based crash analysis methods
  - All references to safety analysis in docs/pubs point to Publication 638: District Highway Safety Guidance Manual for crash analysis methods

Updates to Design Manuals (rolling out 2014-2015) facilitate use of the HSM methodology during any point of the PDP!
HSM Implementation

Crash Analysis Methods

- Based on HSM methods for predicting crashes
- Customized user friendly analysis tools will aid in application of HSM methods to PennDOT crash analysis
- Publication 638 (District Highway Safety Guidance Manual) is sole source of guidance on safety/crash analysis methods
- Publication 638 will be made available to consultants for use in guiding safety/crash analysis in project development
Road Safety Assessment

- Independent Roadway Safety Assessment (RSA) process following FHWA’s guidance on Roadway Safety Audits/Assessments
- Requires assessment to be performed at a minimum:
  - During planning/preliminary design and
  - During final design
  - Other times as deemed necessary by PennDOT
- Ensures quantitative safety analysis is incorporated at the right times and places within project development
HSM Implementation

Design Exceptions

• Manual updates provide guidance on performing safety analysis for design exceptions per HSM methods.
• Goal: *use HSM in all applicable design exception requests*
PA Safety Performance Functions (SPF’s)

- Completed in October 2014
- SPF: Equation that predicts average number of crashes
- Developed for three digit, two lane, rural roads and certain intersections based on the characteristics unique to PA (driving habits, topography, roadway details, etc)
- *Will help direct limited safety dollars to areas of greatest need within the state*
**PA Crash Modification Factors (CMF)**

- Project Completed
- Estimates change in expected crashes due to countermeasures specific to PA; accounts for features unique to PA such as driving habits, topography, roadway characteristics, etc.

- Applications:
  - Utilizing CMFs
  - Multiple CMFs at a location
  - Quality of a CMF
HSM Implementation

HSM Spreadsheet (PA Specific)

- To be completed in November 2014
- Customization of HSM tools for PA
- Single tool that combines user interface for any of three spreadsheet calculations
HSM Implementation

HSM Training Course

- Piloted in December 2014
- Begin February 2015
- Application of HSM in project development
- Utilization of HSM Spreadsheet
- Comparison of alternative designs based upon safety assessment
HSM Implementation

HSM Training Course

- *Spread the word* to Design/Project Development Staff
- Inform Consultants of this new direction/training opportunity
Conclusion

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