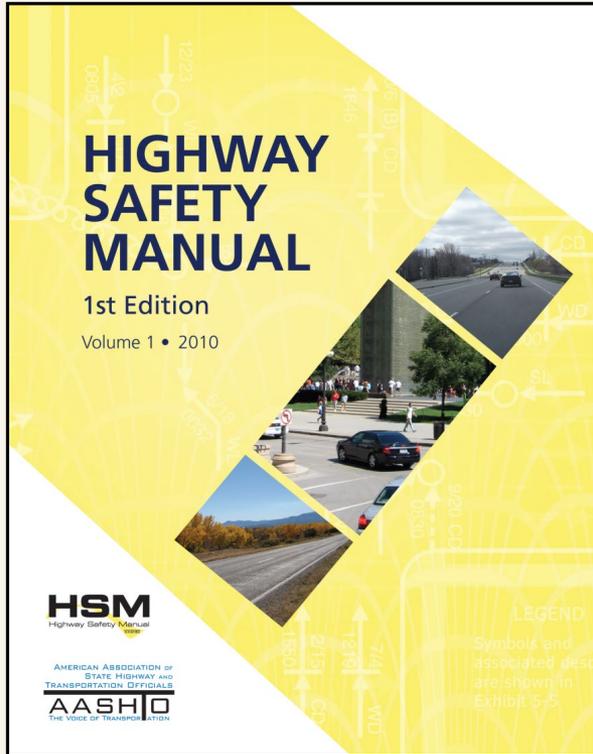


Performance-Based Decision Making

Highway Safety Manual Implementation



What Is the HSM?

- A tool to improve safety analyses
- Encourages a “science-based” technical approach to safety analysis
- Minimizes biased results



Helps decision makers make more informed project design decisions

Highway Safety Manual

Integrating Safety into Decision Processes

- Enables more informed performance-based decision-making
- Helps explain decisions to stakeholders

“Road safety management is in transition. The transition is from action based on experience, intuition, judgment, and tradition, to action based on empirical evidence, science, and technology...”

Ezra Hauer (May 2005)

University of Toronto, Toronto, Canada

Why Do We Need the HSM?

Predictive Analysis:

Uses crash, roadway, and traffic volume data to provide **estimates** of an existing or proposed roadway's predicted **safety performance**.

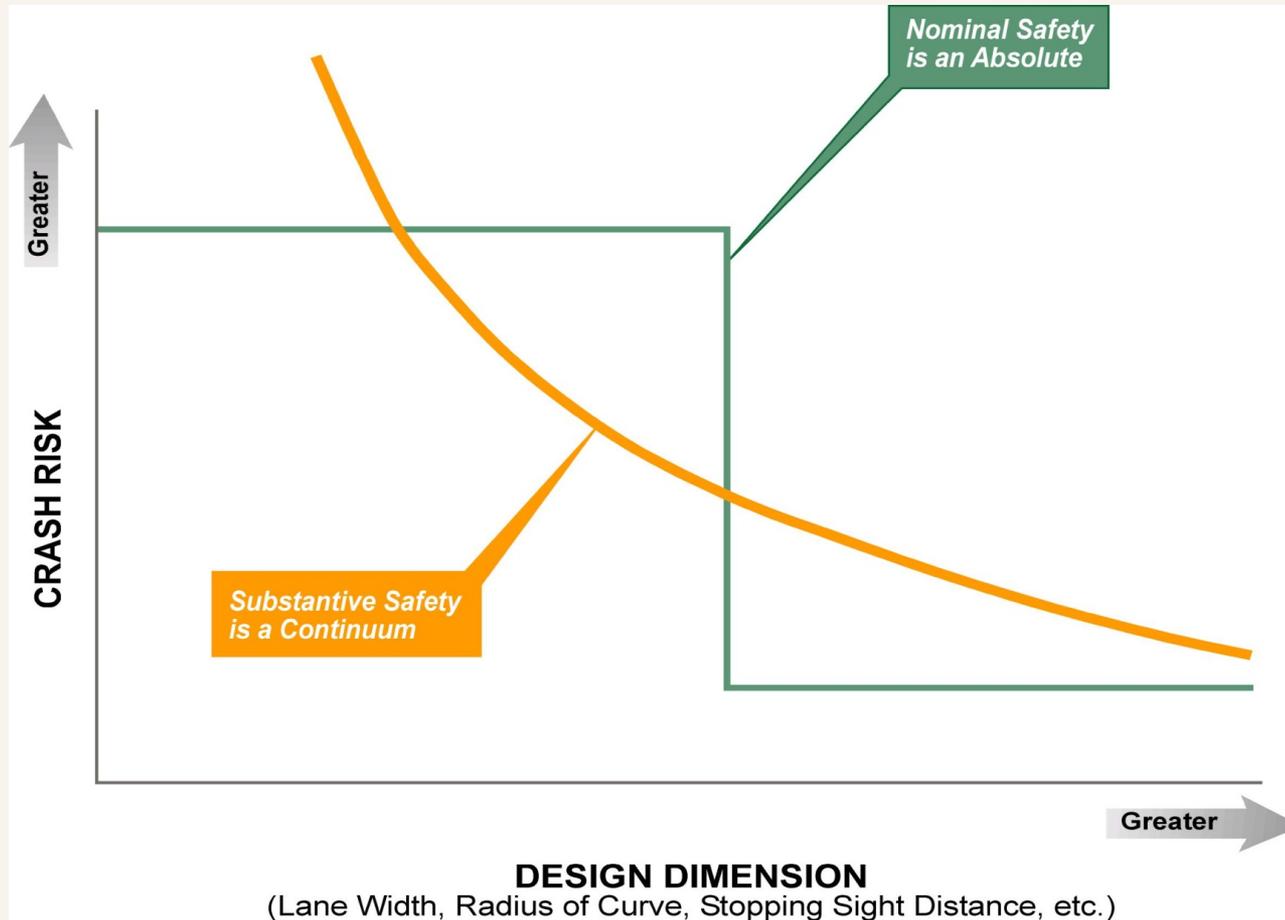
Helps agencies **quantify** the **safety impacts** of transportation decisions, similar to the way agencies quantify:

- environmental impacts
- traffic operations
- pavement life
- construction costs



HSM Analysis

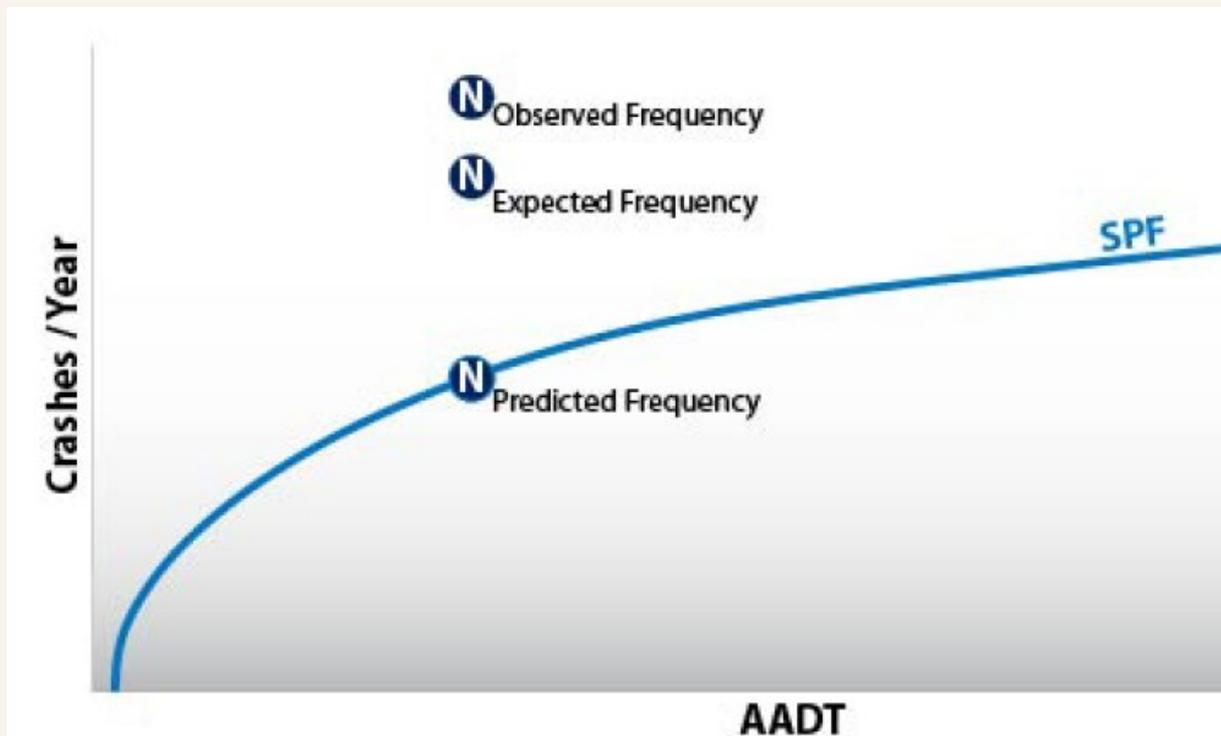
Data-driven technical approach to safety analysis



HSM Tools

Primary tools:

- Interactive Highway Safety Design Model (IHSDM)
- Enhanced Interchange Safety Analysis Tool (ISATe) spreadsheets



HSM Implementation Guidance

Support Transportation Safety and Health, and assist in Caltrans' Toward Zero Death goal

Adopt the HSM as a guideline for project safety analysis

Determine the right projects at the right location at the right time

Ensure successful HSM Implementation statewide

HSM Implementation

1. Caltrans secured National Highway Institute (NHI) contract to delivery HSM training
 - FHWA Resource Center provided training to Caltrans engineers from 2015-2020
 - 3-days training session
2. Implementation guidance and application guidelines
Caltrans internal memo dated August 12, 2019
 - Highway Safety Manual shall apply to state highway projects that meet the minimum criteria specified in the guidelines and have a PA/ED date after June 30, 2020

HSM Applications to Projects

Minimum requirement for HSM application:

1. Projects that change access on the Interstate System

2. Safety Improvement Projects:

Design variations that consider the safety improvement strategies that uses:

a. Non-standard travel and/or shoulder widths; and/or

b. Geometric curve radius upgrades

3. All other projects:

Design variations that propose

a. Non-standard travel and/or shoulder widths; and/or

b. Non-standard geometric curve radius

HSM Applications to Projects

Roles and Responsibilities:

PE/Design staff:

- Collaborate with Traffic Operations staff to build model in the HSM software tool
- Perform data-driven analysis using the appropriate HSM software tool
- PE is the responsible charge of design solution

Project Development Team:

- Determine the need and usefulness of HSM analysis for making performance-based decisions on design solutions in project alternatives
- Collectively evaluate and recommend the preferred alternative/solution using reasonable engineering judgement as prescribed in Chapter 8 of the Project Development Procedures Manual

HSM Applications to Projects

HSM Analysis:

1. Comparison between project alternatives
2. Comparison between different geometric design variations

Analysis:

Support justification for design decisions

Design Standards Decision Document

HSM Training Resource: NHI & FHWA

http://www.highwaysafetymanual.org/Pages/training_sub.aspx

Performance-Based Decision Making

Thank you

Questions?