

# Use of AASHTO Highway Safety Manual

New Tools to Predict Crashes and Evaluate Alternatives

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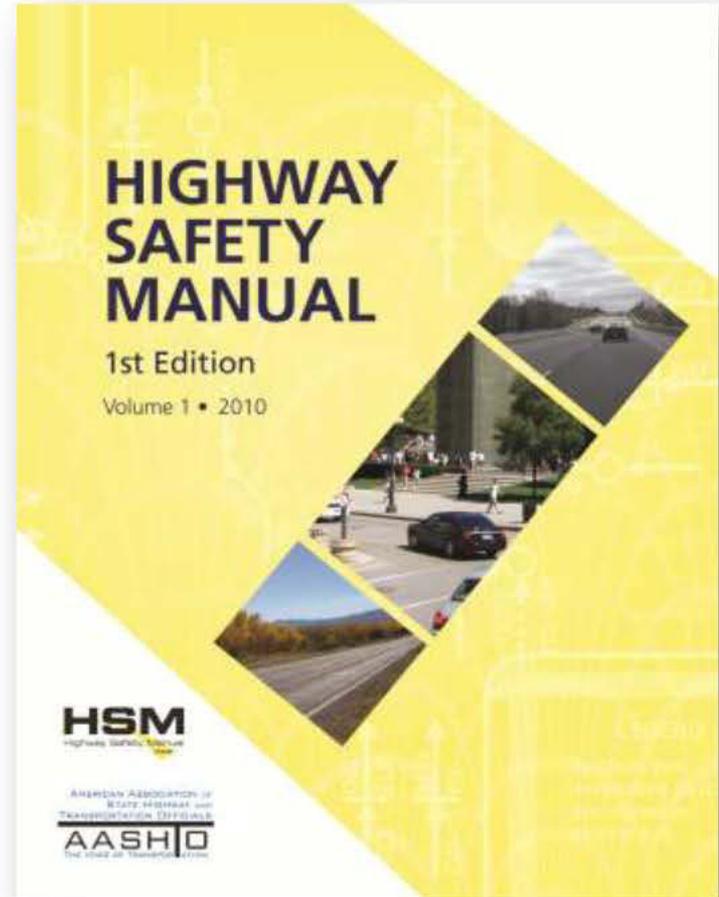
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# AASHTO Highway Safety Manual

Quantify effect of decisions  
on crashes

Accountability/  
Performance Measurement



# Highway Safety Manual

What is its purpose?

The purpose of the Highway Safety Manual (HSM) is to provide the best factual information and proven analysis tools for crash frequency prediction. The HSM will facilitate integrating quantitative crash frequency and severity performance measures into roadway planning, design, operations, and maintenance decisions. The primary focus of the HSM is the increased application of analytical tools for assessing the safety impacts of transportation project and program decisions.

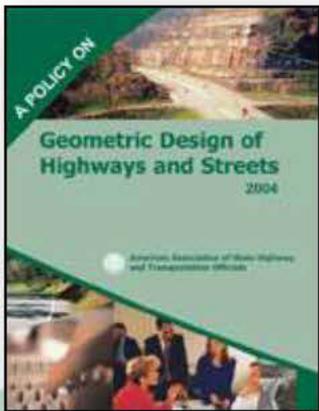
What are its uses?

- Identify sites with the most potential for crash frequency or severity reduction.
- Identify factors contributing to crashes and associated potential countermeasures to address these issues.
- Evaluate the crash reduction benefits of implemented treatments.
- Conduct economic appraisals of improvements to prioritize projects.
- Calculate the effect of various design alternatives on crash frequency and severity.
- Estimate potential crash frequency and severity on highway networks, and the potential effects of transportation decisions on crashes.

# The HSM Helps Change How We Think About SAFETY

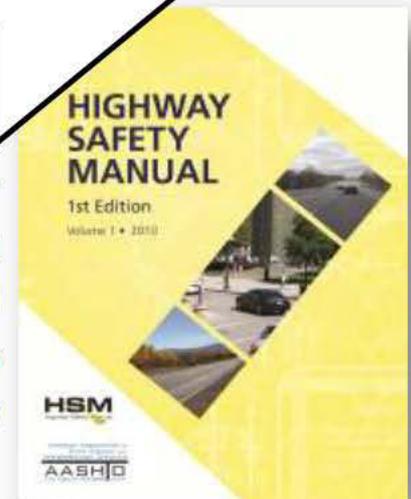
*Nominal  
Safety*

*Substantive  
Safety*



Examined in reference to compliance with standards, warrants, guidelines and sanctioned design procedures

The expected or actual crash frequency and severity for a highway or roadway



## Part A

Introduction  
Human Factors  
Fundamentals

## Part D

Crash Modification  
Factors (CMFs)



## Part B

Roadway Safety  
Management  
Process

## Part C

Predictive Method

# Tools

## FHWA CMF Clearinghouse



## TRB Human Factors Guidelines



## SafetyAnalyst



<placeholder graphic>

## IHSDM



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## Spreadsheets



# SafetyAnalyst

The Network Screening Tool identifies sites with potential for safety improvements.

The Diagnosis Tool is used to diagnose the nature of safety problems at specific sites.

The Countermeasure Selection Tool assists users in the selection of countermeasures to reduce accident frequency and severity at specific sites.

The Countermeasure Evaluation Tool provides the capability to conduct before-and-after evaluations of implemented safety improvements.

The Economic Appraisal Tool performs an economic appraisal of a specific countermeasure or several alternative countermeasures for a specific site.

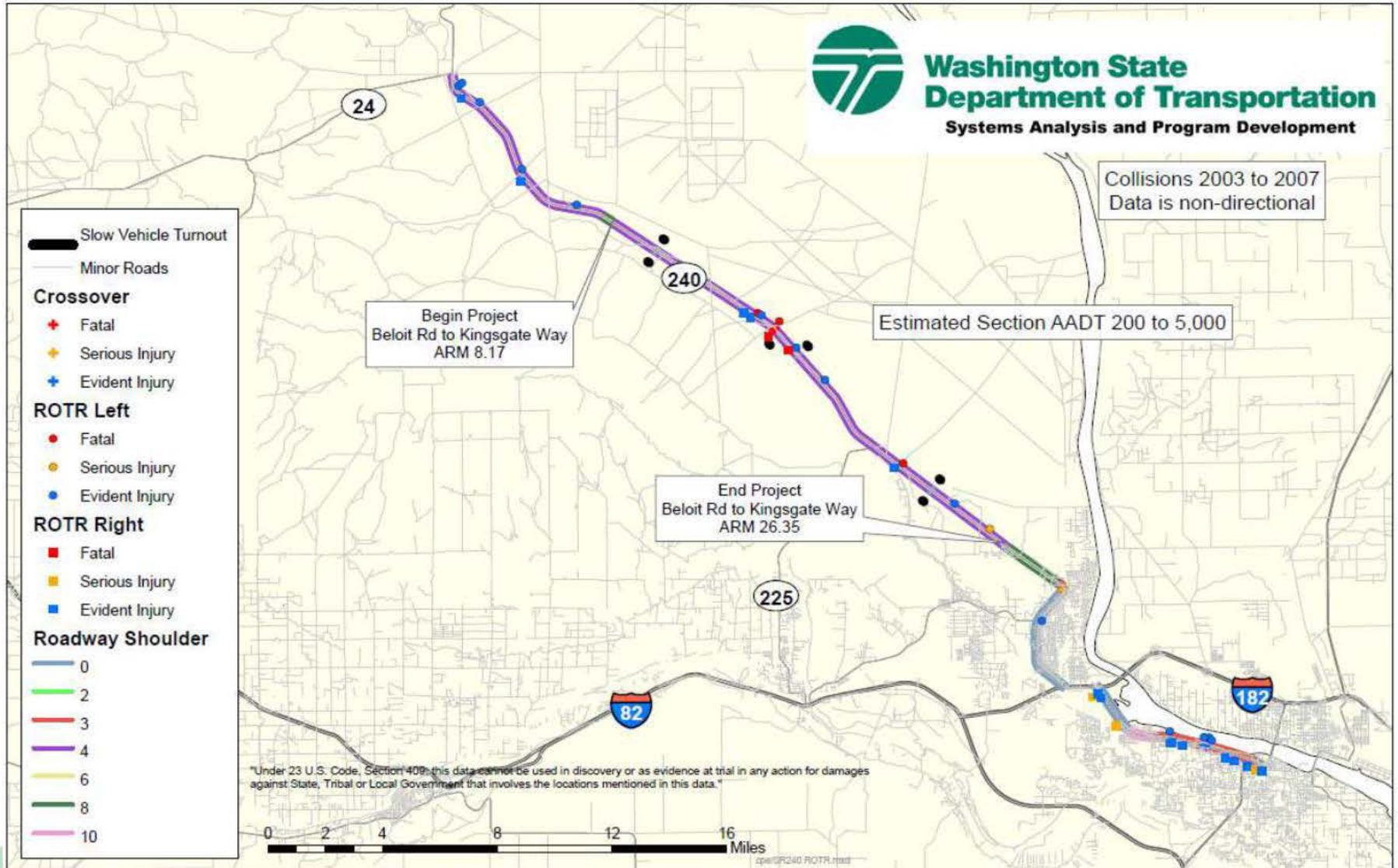
The Priority Ranking Tool provides a priority ranking of sites and proposed improvement projects based on the benefit and cost estimates determined by the economic appraisal tool.



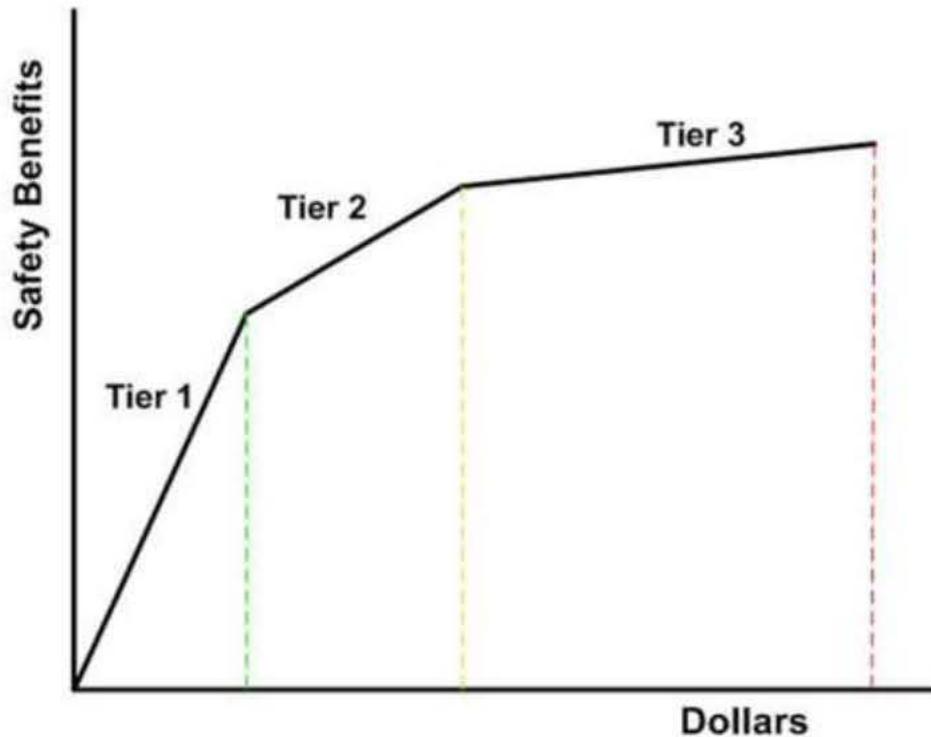
# Expected Benefits of SafetyAnalyst

Effectiveness of Decision Making: SafetyAnalyst automates state-of-the-art statistical approaches described in the *Highway Safety Manual (Part B)* to improve the identification and programming of site-specific highway safety improvements. In some cases, SafetyAnalyst provides improved procedures for some functions that highway agencies already perform in automated fashion. In addition, SafetyAnalyst automates procedures that are now performed manually by highway agencies.

# Corridor Analysis for Investment Decision Making



# Alternative Evaluation



- Consider options or countermeasures, an expensive, moderate and low cost solution (asset modification) to achieve reduction in fatal and serious crashes
- Complete a root cause analysis (evaluation)
- Solutions need not be infrastructure related (eg the 4 Es) we add one more E (evaluation)
- Tier 3 assumes that the solution will generate benefits over time (20 years typical)
- Due to random nature of crashes, they may or may not occur
- Some locations have a higher likelihood such as interstate/high volume roadways
- Tier 3 solutions generally come at a high cost

# SR 161 Corridor Analysis

Designed to full standards.  
\$7.5million,

- Horizontal Re-alignment
- Left Turn Channelization
- Localized improvements 0.67 miles

Used SafetyAnalyst to evaluate the  
safety needs in the corridor.  
\$3.0 million,

- Corridor Wide improvements 9 miles
- Tiered Solutions, (Chevron's, Traffic Arrows, Illumination and Barrier)

# Questions?

For additional information regarding SafetyAnalyst,  
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