

# Highway Safety Manual

October 3, 2012

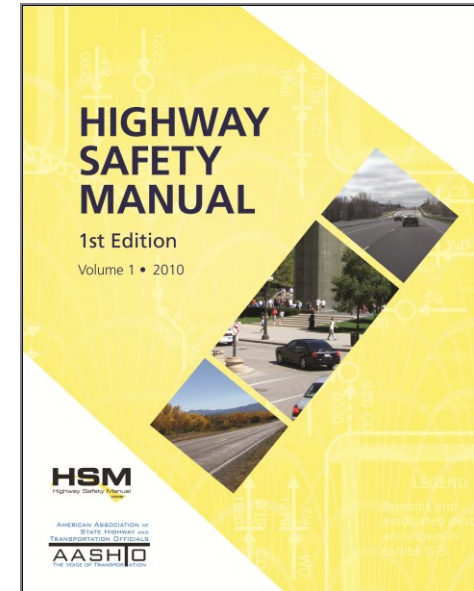
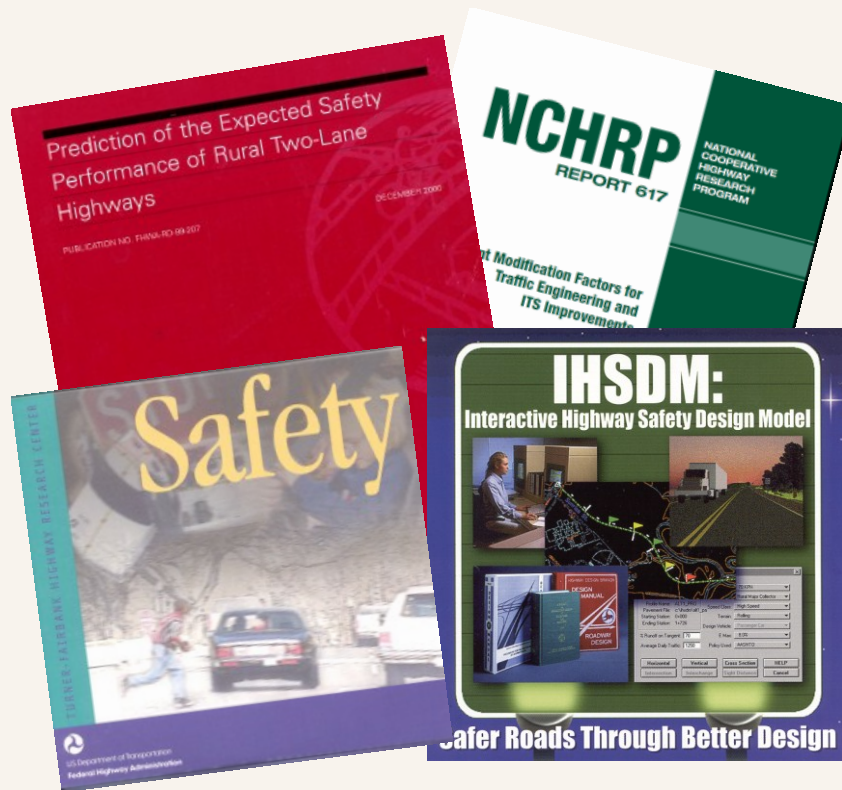
Chris Kinsey, P.E. – Traffic Engineering Division

Ryan Brumfield - FHWA



# What is the HSM?

## Contains Best Science & Research



- Synthesis of previous research
- New research commissioned by AASHTO and FHWA

# Purpose of the HSM

- Assist transportation agencies in their effort to integrate safety into their decision making processes
- A resource document that is used nationwide to help transportation professionals conduct safety analysis in a technically sound and consistent manner
- A tool that can be used to support states' progress toward federal, state, and local safety goals to reduce crashes

# OUTLINE of the HSM

## Part A

Introduction  
Human Factors  
Fundamentals

## Part D

Crash Modification  
Factors (CMFs)



## Part B

Roadway Safety  
Management  
Process

## Part C

Predictive Method

# HSM Content and Structure



## Part A - Introduction, Human Factors, and Fundamentals

Chapter 1 – Introduction and Overview  
Chapter 2 – Human Factors  
Chapter 3 - Fundamentals

## Part B - Roadway Safety Management Process

Chapter 4 – Network Screening  
Chapter 5 – Diagnosis  
Chapter 6 – Select Countermeasures  
Chapter 7 – Economic Appraisal  
Chapter 8 – Prioritize Projects  
Chapter 9 – Safety Effectiveness Evaluation

## Part C - Predictive Method

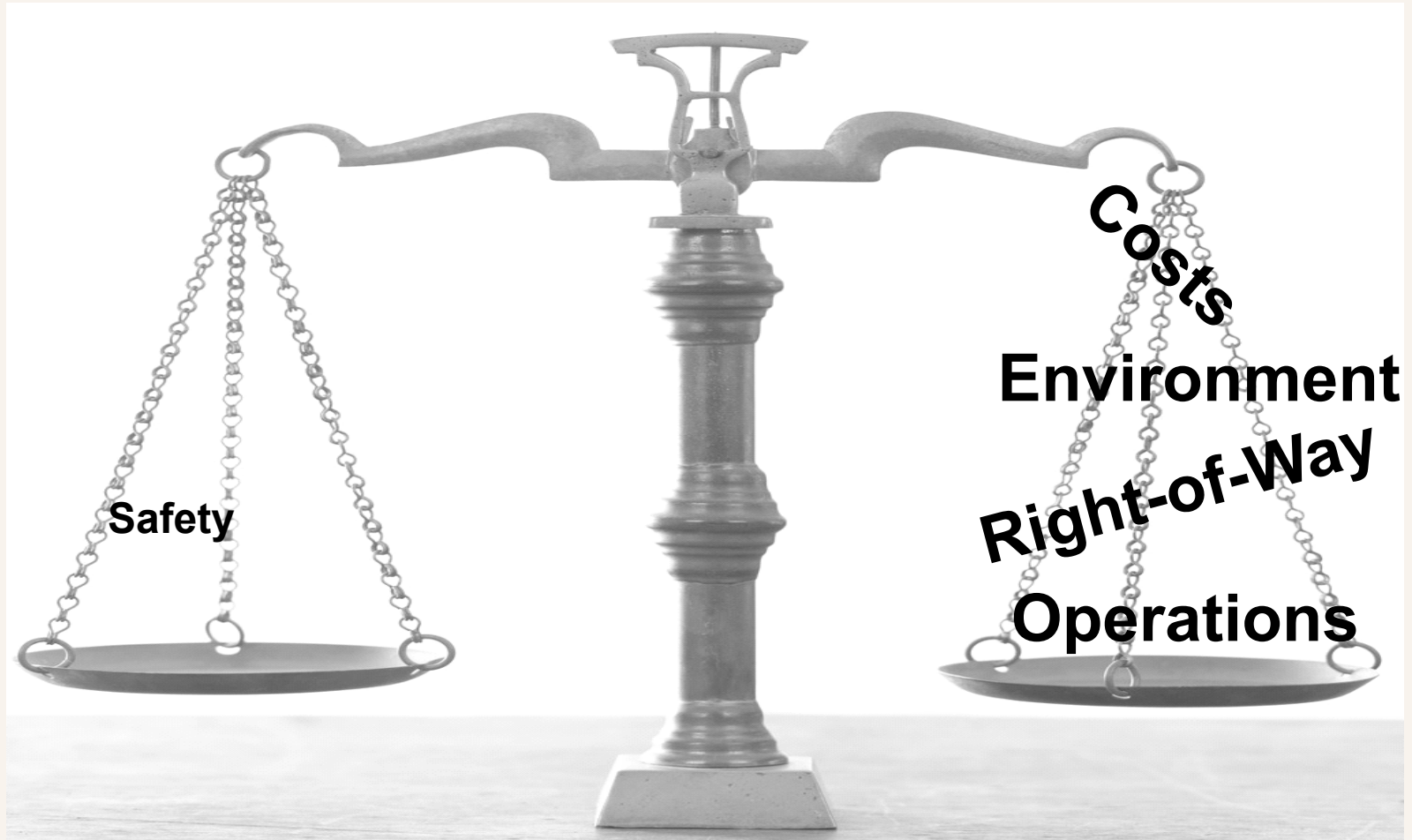
Chapter 10 – Rural Two-Lane Roads  
Chapter 11 – Rural Multilane Highways  
Chapter 12 – Urban and Suburban Arterials

## Part D - Crash Modification Factors

Chapter 13 – Roadway Segments  
Chapter 14 – Intersections  
Chapter 15 – Interchanges  
Chapter 16 – Special Facilities  
Chapter 17 – Road Networks

# Why should we use the HSM?

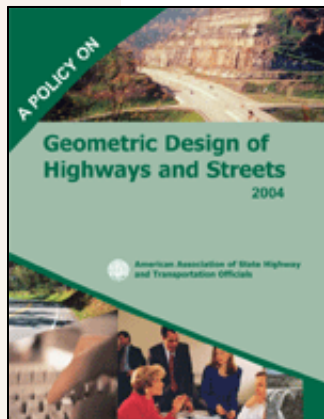
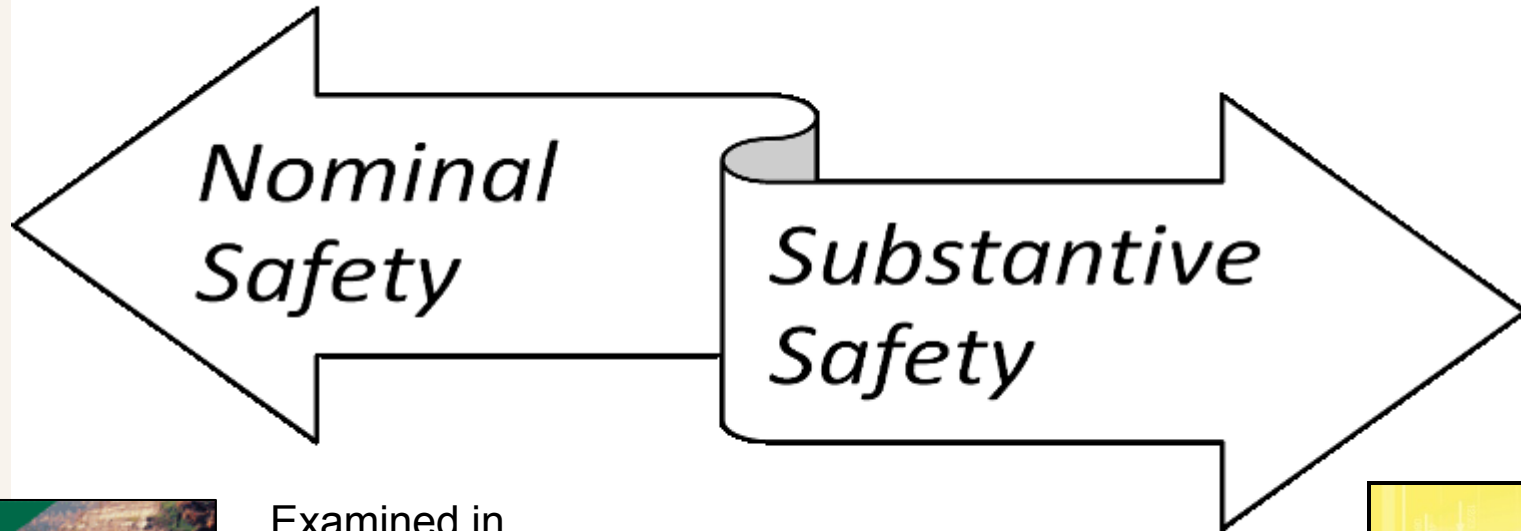
Quantifying safety facilitates tradeoff analysis...





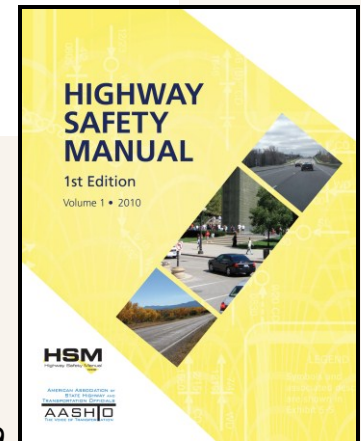
# Why should we use the HSM?

HSM methods complement design guidelines...



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

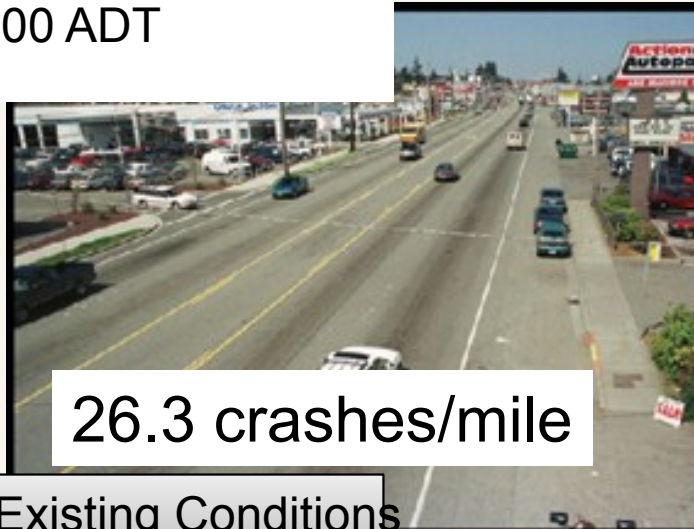


*\*Ezra Hauer, ITE Traffic Safety Toolbox Introduction, 1999*

# SUBSTANTIVE SAFETY MAY VARY

## Even when meet NOMINAL Geometric Requirements

At 20,000 ADT





# Benefits of Using the HSM

Better methods improve the “bottom line”



- Better safety analysis tools to support decision making

- More safety cost-effective investments

- More lives saved and injuries avoided per dollar invested

# HSM Implementation

## Current method:

- Safety Study initializes a project with proposed countermeasures.
- Pull the Crash Data for the location.
- CMF Clearinghouse to obtain the CMF's for the recommendations from the study.
- Crash Reduction Calculations by hand to obtain the number of preventable crashes.
- Number of Preventable Crashes to calculate the B/C ratio

# HSM Implementation

## ERP:

- Safety Management System (SMS) will incorporate the HSM into the ERP system.
  - Crash Data
  - CMF's will be preloaded into the SMS from the CMF Clearinghouse along with the cost estimates.
  - Currently Calibrating WV's own CMF's
  - Benefit Cost Analysis will be included in the SMS
  - Project Prioritization

# HSM Implementation

## Future method:

- Safety Study initializes a project with proposed countermeasures.
- Within ERP's Safety Management System
  - Run Crash Data
  - Use the preloaded CMF's to calculate the preventable crashes.
  - Use the Benefit Cost Analysis tool to justify the project or to prioritize.

# Why Do We Need the HSM?

## Fatalities:

- 2010 – 315
- 2011 – 338
- Through August of this year we have had 252 Fatalities.
- On pace for 358+ fatalities this year.



# Crash Database Update

- MPO Data – Expected release date of October 12th
- Database for Traffic Engineering is expected to be completed by January 1<sup>st</sup>
- Database access for the rest of the users will be in late Jan-Feb

## Contact Information

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