



New Analytical Tools for Safety Management of Urban and Suburban Arterials

Douglas W. Harwood
Midwest Research Institute
Kansas City, MO

Key Developments

- New and better organized information on countermeasure effectiveness
- Better tools to identify problems and formulate solutions
- Better tools to quantify the safety performance of arterials

New and Better Organized Information on Countermeasure Effectiveness



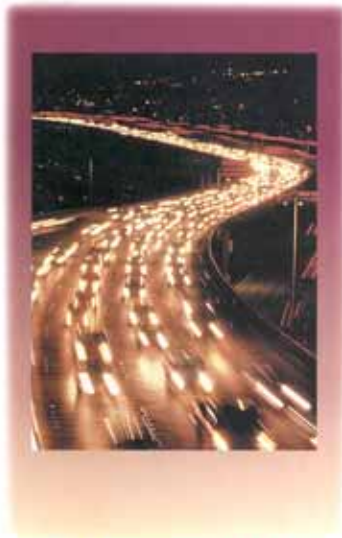
Access Management Manual

A major step forward.....

TRB's Access Management Manual

AASHTO Strategic Highway Safety Plan

AASHTO Strategic Highway Safety Plan

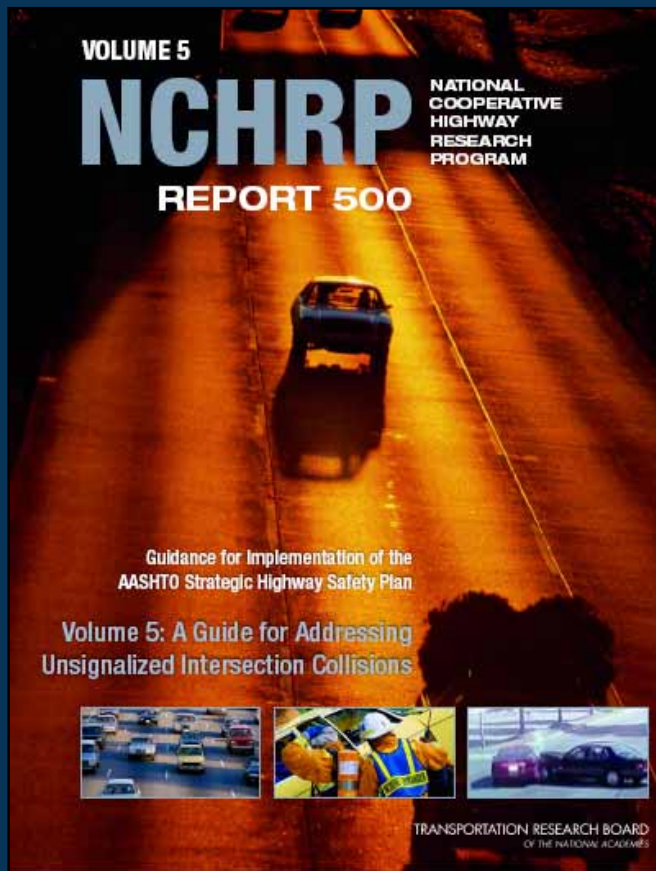


A Comprehensive Plan to
Substantially Reduce
Vehicle-Related Fatalities and
Injuries on the Nation's Highways

GOAL:

- Reduce fatality rate from 1.5 to 1.0 deaths per 100 MVMT and over 9,000 lives saved annually by 2008

NCHRP Report 500 Implementation Guides



- Printed guides – published by TRB
- Web site – safety.transportation.org/plan.aspx



NCHRP Report 500 Implementation Guides

ALREADY PUBLISHED

- Aggressive Driving
- Unlicensed Drivers/
Suspended and
Revoked Licenses
- Trees in Hazardous
Locations
- **Unsignalized
Intersections**
- Head-on Accidents
- Run-off-road
Accidents

SUMMER 2004

- Older Drivers
- Safety Belts
- Heavy Trucks
- **Pedestrians**
- Horizontal Curves
- Utility Poles
- **Signalized
Intersections**



NCHRP Report 500 Implementation Guides

SPRING 2005

- Motorcyclists
- Work Zones
- Rural EMS
- Distracted/Fatigued Drivers
- Alcohol

SPRING 2006

- Bicycles
- Younger Drivers
- Head-on Crashes on Freeways
- Data Needs, Sources, and Analysis



Better Tools to Identify Problems and Formulate Solutions

Needs for Improved Software Tools

- Current computer algorithms for network screening to identify potential problem locations use 1960s and 1970s approaches
- Collision diagram software is not always directly integrated with traffic accident records systems
- Collision diagrams typically focus on intersections, but not roadway segments between intersections

Needs for Improved Software Tools

- Identification of accident patterns from collision diagrams is typically a manual process
- Countermeasure selection is typically a manual process
- Economic analysis is generally not integrated with traffic accident records systems

Needs for Improved Software Tools

- Effectiveness evaluation of implemented countermeasures:
 - not performed routinely
 - use outdated statistical procedures
 - require manual or off-line analysis



FHWA *SafetyAnalyst* Software Tools

- Network screening to identify sites with promise for safety improvement
- Diagnosis to identify accident patterns
- Countermeasure selection
- Economic analysis
- Priority ranking
- Post-implementation evaluation of safety effectiveness



FHWA *SafetyAnalyst* Software Tools

- Further information

www.safetyanalyst.org

Better Tools to Quantify the Safety Performance of Arterials

- Will present procedures to make quantitative safety estimates:
 - safety performance of specific roadways and intersections
 - anticipated safety effects of proposed improvement projects
- Analogous to how the HCM is used for traffic operational estimates
- First edition -- 2008



TRB Highway Safety Manual

- Part I – Introduction
- Part II – Safety Knowledge
- Part III – Prediction Methodologies
 - rural two-lane highways
 - rural multilane highways
 - urban/suburban arterials
- Part IV – Safety Management
- Part V – Safety Effectiveness Evaluation

Completed Research

- NCHRP Project 17-18(4)
 - scoping study
 - developed overall work plan for HSM development
 - developed detailed outline
 - developed prototype chapter on rural two-lane highways

Ongoing Research

- NCHRP Project 17-26
 - developing safety prediction methodology for urban and suburban arterials
- NCHRP Project 17-29
 - developing safety prediction methodology for rural multilane highways
- NCHRP Project 17-27
 - developing HSM Part I – Introduction
 - developing HSM Part II -- Knowledge



Safety Prediction Methodology for Urban and Suburban Arterials

- Types of roadway segments considered:
 - two-lane undivided
 - four-lane undivided
 - four- and six-lane divided
 - three- and five-lane with center TWLTL

Safety Prediction Methodology for Urban and Suburban Arterials

- Types of intersections considered:
 - three-leg with minor-road STOP control
 - three-leg signalized
 - four-leg with minor-road STOP control
 - four-leg signalized

Safety Prediction Methodology for Urban and Suburban Arterials

- Safety predictions will be made separately for each:
 - roadway segment
 - intersection
- Within roadway segments, safety predictions may be made separately for:
 - individual driveways
 - individual median openings

Safety Prediction Methodology for Urban and Suburban Arterials

- Overall safety predictions for a extended section or project:
 - sum safety performance for individual design elements
- Empirical Bayes procedures to compensate for regression to the mean



Highway Safety Manual

- Further information:

www.highwaysafetymanual.org