

NCHRP 20-68A “US Domestic Scan Program”

DOMESTIC SCAN 16-01

LEADING PRACTICES IN THE USE OF
THE HIGHWAY SAFETY MANUAL FOR
PLANNING, DESIGN, AND OPERATIONS

NCHRP 20-68A “US Domestic Scan Program”

DOMESTIC SCAN 16-01

LEADING PRACTICES IN THE USE OF
THE HIGHWAY SAFETY MANUAL FOR
PLANNING, DESIGN, AND OPERATIONS

Leading Practices in the Use of the Highway Safety Manual for Planning, Design and Operations

Scan conducted as a part of NCHRP Project 20-68A, the U.S. Domestic Scan program

- Program requested by American Association of State Highway and Transportation Officials (AASHTO)
- Funding provided through National Cooperative Highway Research Program (NCHRP)

NCHRP 20-68A

U. S. Domestic Scan Program

- Program is multi-year project conducting 3-4 scans per year
- Each scan selected by AASHTO and NCHRP 20-68A Project Panel
- Each scan addresses a single technical topic of broad interest to many state departments of transportation and other agencies
- Purpose of each scan and Project 20-68A is to accelerate beneficial innovation by:
 - Facilitating information sharing and technology exchange among states and other transportation agencies
 - Identifying actionable items of common interest

Objectives of Domestic Scan 16-01

- A. Evaluate processes, job aids/tools, workforce training, and manner in which states have institutionalized the HSM as part of performance-based processes and asset management in planning, design, and operations
- B. Learn from practices of leading transportation agencies
- C. Disseminate information to other transportation agencies to help them reduce the number of traffic fatalities and serious injuries that occur on the nation's highways and make informed decisions to reduce project and operating costs

Scan Team

John C. Milton, Ph.D., P.E. – AASHTO Chair

Director Transportation Safety, Quality, & Enterprise Risk
Washington State Department of Transportation

Michael Vaughn, P.E.

Highway Safety Improvement Program
Division of Traffic Operations
Kentucky Transportation Cabinet

Samuel Sturtz

Transportation Planner
Office of Systems Planning
Iowa Department of Transportation

Jerry Roche, P.E.

Office of Safety – Data & Analysis Tools Team
Federal Highway Administration, USDOT

Dave Duncan

Transportation Manager 1, Region 4
Strategic Transportation Investments Division
Tennessee Department of Transportation

Dennis Emidy, P.E.

HSIP Engineer
Bureau of Planning
Maine Department of Transportation

Darren J. Tobic, Ph.D. — SME

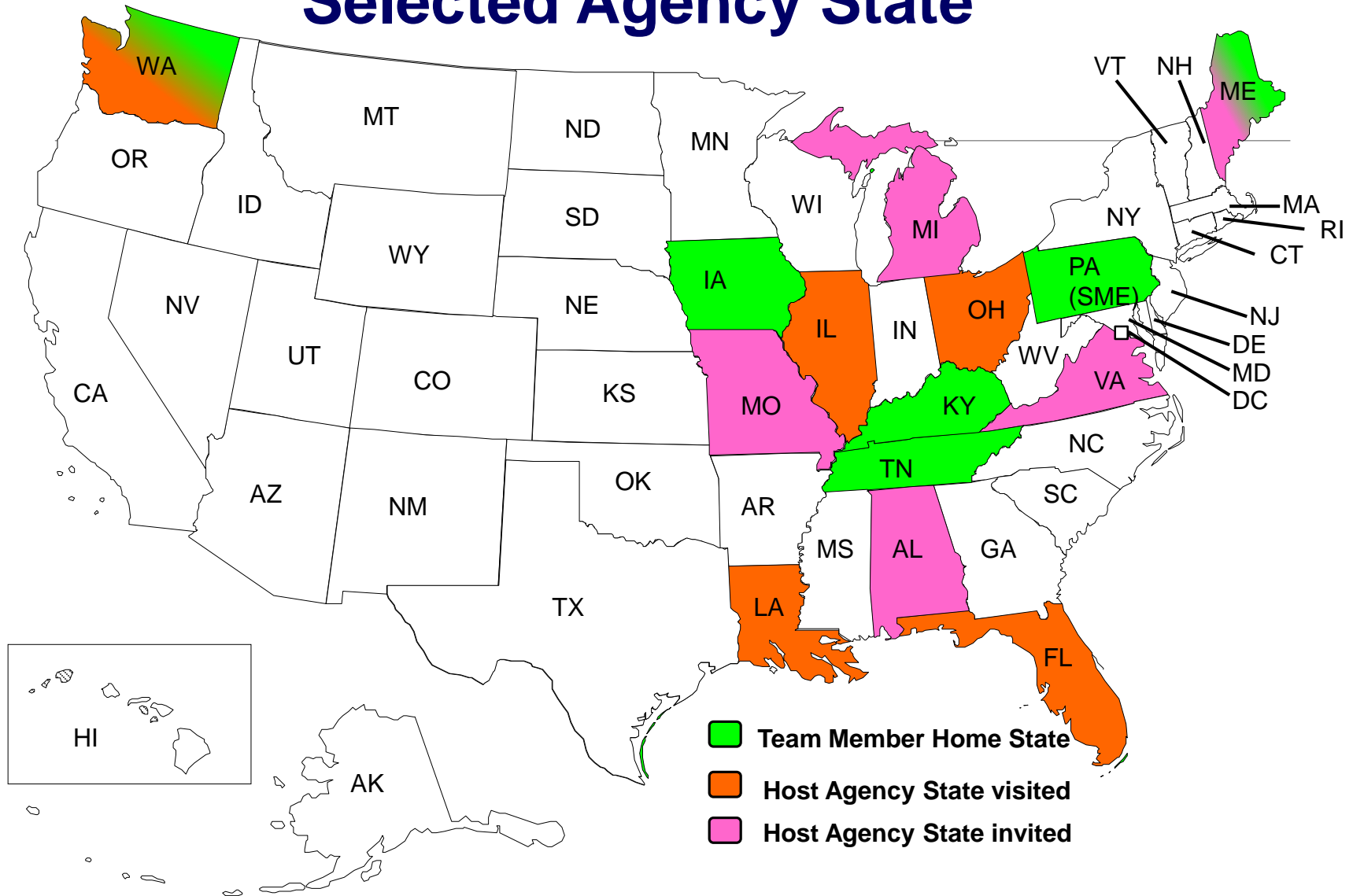
Principal Traffic Engineer
MRIGlobal

Acknowledgement:

Harry Capers, P.E., (P.I. of NCHRP Project 20-68A)
Vice President – Arora and Associates, P.C.

Michael Wright, P.E., P.P., P.M.P (Scan Coordinator)
Senior Vice President – Arora and Associates, P.C.

Scan 16-01 Team Members Home State And Selected Agency State



Outcomes of Scan 16-01

- Scan results will be documented in a report focusing on business processes, job tools/aids, workforce and training, and ways in which state DOTs implemented the HSM in planning, design, and operations as part of a performance-based approach.
- Audience is all state DOTs
 - Local transportation agencies, metropolitan planning organizations (MPOs), FHWA, and AASHTO will also benefit
- Report will cover lessons learned and key components of success
- Dissemination and implementation plan to be developed to further disseminate information learned from domestic scan, beyond simply providing published report

Key Areas of Interest

1. Status / Policy
2. Training
3. Technical Functions
4. Data
5. Cultural
6. Information Dissemination
7. Achieving Performance

Summary of Key Findings

Status / Policy

Triggers that accelerated use and implementation of quantitative safety analyses within lead states

- Involvement of lead states within AASHTO and TRB activities at national level
- Adoption and pursuit of Toward Zero Deaths (TZD) vision
- HSM Champion considered executive-level training to be critical for gaining upper management support for HSM implementation
- Lead states took incremental steps toward implementing HSM

Status / Policy

Triggers that accelerated use and implementation of quantitative safety analyses within lead states

- Champion took lead within agency to incorporate HSM methods within programs and departments. Several lead states also developed HSM implementation teams and plans to guide HSM implementation within their agency.
- Executive Orders – A signed, written, and published directive from Secretary that manages operations of DOT
- Lead states developed executive orders, policies and procedures, and guidance documents that led to institutionalization of HSM methods within their agencies
- Implement in to policy and procedures and through HSM implementation, cultural shift occurred within DOT

Training

Training was essential. It occurred at all levels and was right-sized.

- Identified by discipline and focused on need
- Provided at central and regional/district offices

Technical Functions

- Lead states provided guidance on recommended level of safety analysis
- Lead states developed tools that are ease to use, understandable, and/or made use of existing tools
- Several lead states developed their own HSM User's Guide

Technical Functions

- Lead states first calibrated SPFs
 - Implement HSM methods sooner than if they developed state specific SPFs
- Lead states supplemented their traditional approach to improving high-crash locations with systemic approach to safety improvements
- Lead states helped local agencies develop local road safety plans

Technical Functions

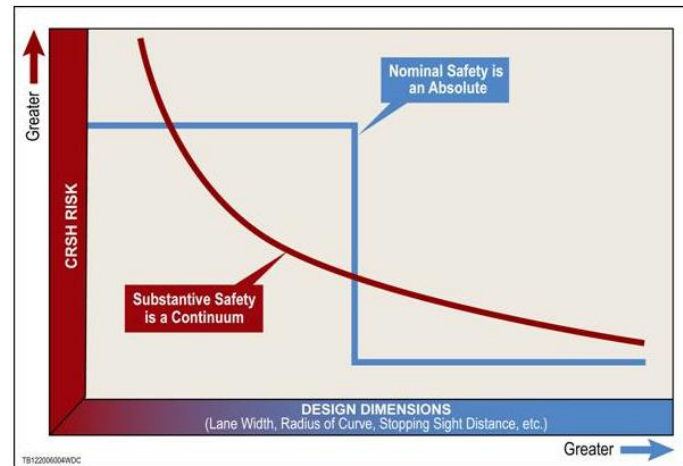
- HSM helps support engineering judgement and planning and programming decisions
- HSM methods are evolving
 - Need to integrate new research

Data

- Lead states developed short-term and long-term vision for use of their data
- Recurring theme was lack of available and/or reliable data

Cultural

- Cultural shift required for agencies to institutionalize implementation of HSM
- Understand difference between nominal and substantive safety



Source: NCHRP Report 480 (TRB, 2002)

- Recognize limitation of using crash rate as primary measure of safety performance

Cultural

- Cultural shift required Champions at central and regional/district offices. Key roles of Champion in facilitating HSM implementation included:
 - **Advocacy** – Actively sought support for HSM implementation by communicating that use of HSM procedures is essential
 - **Removing Roadblocks** – Effectively removed roadblocks such as funding, resource allocation, and resistance to change
 - **Explanation** – Spoke to importance of HSM to groups and individuals at events
 - **Appreciation** – Recognized district and consultant personnel who implemented HSM methods on projects

Cultural

- Additional ways cultural shift within an agency was achieved:
 - Established executive orders and policy directives
 - Implemented Kotter's 8-step process for leading change
 1. Create a sense of urgency
 2. Build a guiding coalition
 3. Form a strategic vision and initiatives
 4. Enlist a volunteer army
 5. Enable action by removing barriers
 6. Generate short-term wins
 7. Sustain acceleration
 8. Institute change
 - Established HSM Implementation Team
 - Made safety analyses and procedures simple and accessible

Cultural

- As cultural shift occurred, staff realized improving safety performance is everyone's responsibility
 - Safety is more than HSIP
 - Safety is more than safety program
 - Safety funds are shared with other programs and projects

Information Dissemination

- To effectively implement HSM required good internal and external information dissemination
 - Internally
 - Externally
 - Internal and external
 - Visual presentations helped communicate safety-related information
 - HSM helped agencies respond to perceived safety concerns from public, elected officials, media, etc.

Information Dissemination

- Where agencies have liability concerns, it results from not properly following processes/procedures or not documenting
 - Sections 23 USC 409 and 148(h)(4) provide greater ability to disseminate safety data publicly

Achieving Performance

How do you define acceptable performance in achieving HSM goals, objectives, and targets?

- Framework has been established within agency to implement HSM methods
 - HSM has been integrated into policies, procedures, and guidelines
 - Objectives and goals for performance measures are tied to systemic and strategic approaches
 - Staff understand limitations and applications of HSM methods
 - HSM is used early in planning and project development
 - Staff are equipped with appropriate tools to perform their jobs

Further Actions

Status / Policy

- Agencies should become more involved with AASHTO and TRB activities at national level
- Agencies should put structure in place that includes Champions at central and regional offices and develop an HSM implementation team and plan
- Agencies should develop executive orders, policies and procedures, and guidance documents to facilitate use of HSM methods
 - Recognizing implications of using the term “safety” in planning, programming, and project development
 - Aligning purpose and needs statement with safety evaluation, analysis, and diagnosis
 - Putting in place agreements with stakeholder oversight agencies (e.g., stewardship agreement)

Training

Develop a robust HSM training program that:

- Identifies various levels of HSM training and who needs training
- Identifies tools to be used and instructs users on how to properly use them
- Identifies where roadway, traffic volume, and crash data are stored, and how users can extract data for use in HSM analyses
- Trains users on how to interpret/evaluate HSM analysis results
- Uses variety of training methods
- Is continuous and regularly updated to address gaps within planning, programming, and project development
- Uses in-house staff to lead or assist in delivery of training

Technical Function

- Agencies should provide direction to staff on use of HSM methods in planning, programming, and project development and align HSM activities across functions
 - Provide direction on recommended level of safety analysis
- Agencies should put processes in place to better understand project scope, definition, and design approach
 - Safety performance quantification should start at earliest stage of planning, programming, and project development

Data

- Agencies should make use of available data to achieve early implementation
- Agencies should evaluate IT resources to achieve use of HSM tools
- Agencies should develop long-term vision for data and identify incremental steps for data collection, integration, and application of HSM methods
 - Safety data governance/business plan

Cultural

- Agencies should develop marketing material that describes benefits of using the HSM and how it can be used in various departments within an agency

Information Dissemination

- Agencies should develop an approach for communicating HSM results to internal and external audiences

Achieving Performance

- Agencies should set goals and objectives for HSM implementation and have a mechanism for tracking HSM implementation over time
- Agencies should have a mechanism for tracking safety performance outcomes over time
- Agencies should have a mechanism to modify agency policy, guidance, and procedures to address gaps, opportunities, and intended outcomes

Recommended Actions for AASHTO and FHWA

AASHTO

- Update HSM website on regular basis

FHWA

- Enhance CMF Clearinghouse search engine
- Provide guidance for reviewing HSM analyses/results

Gaps in HSM

- Crash prediction models
 - Roundabouts
 - Diverging diamond interchanges (DDIs)
 - Pedestrians and bicyclists
 - Systemic safety
- Human factors

Questions?