TRB
2023 MYM

FHWA Update

Matt Hinshaw, P.E.
FHWA Office of Safety

U.S. Department of Transportation
Federal Highway Administration

ZERO IS OUR GOAL
A SAFE SYSTEM IS HOW WE GET THERE

Topics Throughout the Week

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- HSM Pooled Fund Study Updates
- General FHWA DDSA updates
- Turner-Fairbank research updates
- IHSDM updates and potential impacts from HSM2
- Resource Center training updates
- Safe Streets and Roads for All (SS4A)
- “Improving Road Safety for All Users…” Request for Information (discussion on Tuesday afternoon)

HSM Pooled Fund Study Updates

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HSM1 Pooled Fund

- **Working on 3 tasks (updates next)**
- **Developing ideas for remaining funds**
  - Potential peer exchange

HSM2 Pooled Fund

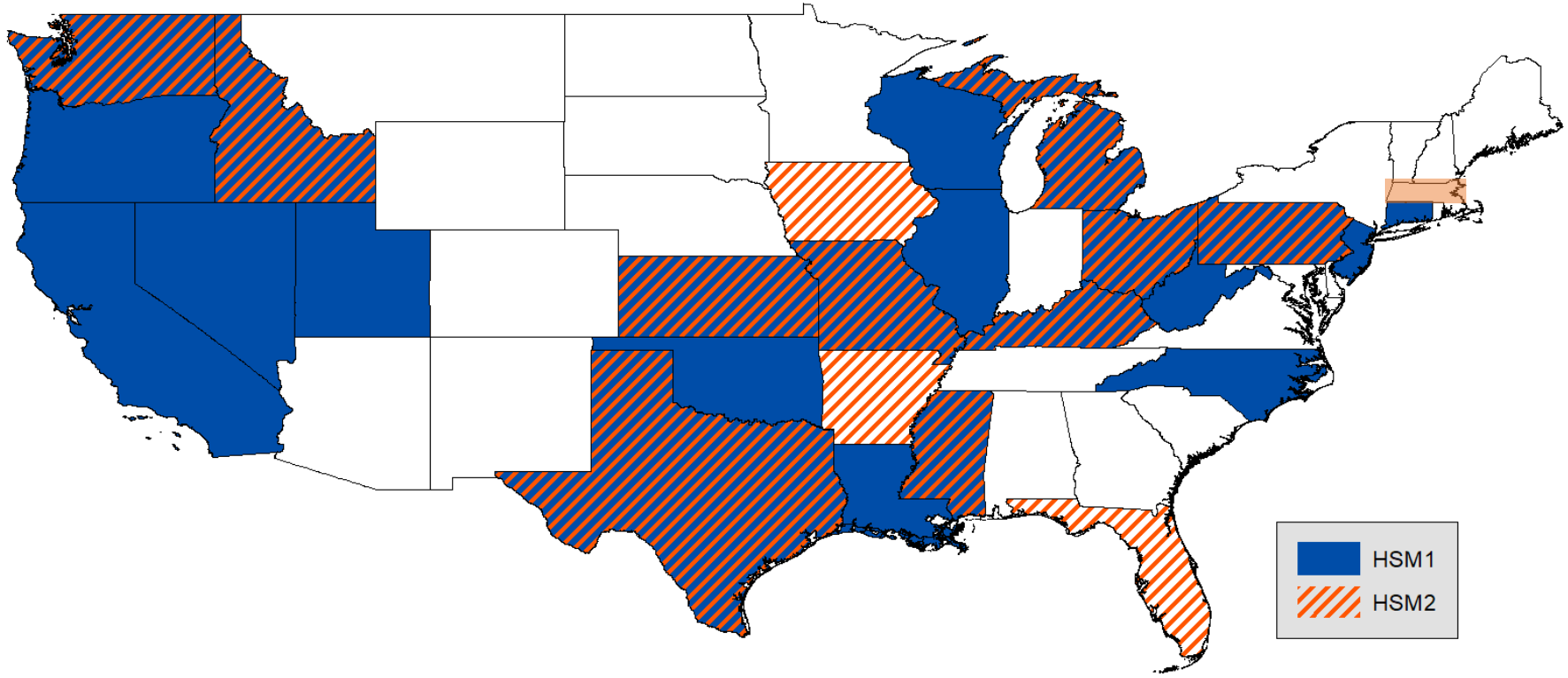
- **Solicitation closed in April**
- **Commitments reached**
  - $500,000 requested
  - $1,088,000 received from 15 states
- **Currently transitioning to active study**
- **https://www.pooledfund.org/Details/Study/748**

HSM Pooled Fund Study Updates

HSM2 Pooled Fund Study Objectives

Accelerate implementation of HSM2 and related analytical tools to assess current and future safety performance of existing roadways and alternative designs, and help practitioners make more informed decisions, better targeted investments, and reduce fatalities and serious injuries on the nation's roadways. This includes activities before and after publication of HSM2 (anticipated 2025).

Participating States



Note: Alaska and Hawaii have not participated.

Source: FHWA

HSM Pooled Fund Study Updates

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Advancing Application of Data-Driven Safety Analysis Task Order: May Quarterly Meeting Update

Task Order Objectives

Project Objectives

1. Explore the combination of predictive methods with and without EB adjustment for alternatives analysis (Task 2)
2. Develop an implementation approach for NCHRP 17-62 (Task 3)
3. Develop a communication guide for explaining HSM safety analysis to non-safety professionals (Task 4)

Task 2 Update: Explore Validity of Combining Predictive Methods

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Conducted literature and State practices review

- How can we appropriately include historic crash data for a location when one or more alternatives result in a change in facility type?
- What is the appropriate traffic volume to use during the study period for each alternative?
- What role does calibration play and how can we use HSM models when we don’t have a calibration factor?

Task 2 Update: Explore Validity of Combining Predictive Methods

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Solicited case study examples and sample data

- NCDOT example focused on no predictive method available
- WisDOT example focused on change in facility type
- HSM User Guide example focused on traffic volume and application of EB method

Task 2 Update: Explore Validity of Combining Predictive Methods

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Project team submitted draft memo highlighting key issues and recommended alternative analysis approach

Based on MassDOT Safety Alternatives Analysis Guide approach

FHWA/PFS reviewing memo

Project team will revise and present to HSM Implementation Pooled Fund

Task 3 Update: Develop an Implementation Approach for NCHRP 17-62 Models

HSM1 Part C methods arrive at number of crashes (N) by severity using two steps

- Predict N (sometimes, by higher-level crash type – e.g., single-vehicle, multi-vehicle)
- Disaggregate N into counts by specific severities using proportions or severity distribution functions (SDFs)

NCHRP 17-62 focused on models for specific crash types and severities

- Resulted in numerous models – perhaps too many
- No verification of whether direct application results in improvement
- Concerns about over- or under-prediction when broken into so many models

Task 3 Update: Develop an Implementation Approach for NCHRP 17-62 Models

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Original objectives of this pooled-fund project

- Examine NCHRP 17-62 models to determine suitability and if they offer an improvement over HSM first edition
- Develop an implementation approach and report for prediction models for crash types and severities from NCHRP 17-62

Met with HSM2 Development Team

- Some selected results of NCHRP 17-62 have been incorporated into draft HSM2 chapters
- Total, KABC, and KAB models for rural two-lane and rural multilane chapters
- Urban arterials in progress
- Based on production team's review

Task 3 Update: Develop an Implementation Approach for NCHRP 17-62 Models

Updates

- NCHRP 17-85 completed and may supersede NCHRP 17-62
- Complicated relationship among NCHRP studies focusing on specific crash types and crash severities
- Specific crash type and severity models show promise beyond the Part C predictive method and may have applications in network screening, systemic project selection, and project programming
  - E.g., models focused on crash types leading to most fatalities and serious injuries

Task 3 Update: Develop an Implementation Approach for NCHRP 17-62 Models

Recommendation for Task 3 Guide

- Review projects completed since the HSM first edition
- Summarize methods used in HSM for crash type and severity as well as recommendations from completed research
- Lay-out key findings and develop recommendations on implementation approaches
  - Describe practical reasons for interest in more specific crash type and severity models
    - Include potential advantages and challenges
  - Comparison of methods for crash type/severity models
  - Identify Potential applications beyond HSM Part C
  - Provide project team recommendations on applications

Task 3 Update: Develop an Implementation Approach for NCHRP 17-62 Models

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Questions to HSM Pooled Fund Study States

- Have you tried implementing any of these products?
- Do you have examples of success or difficulty?
- Have you developed crash type/severity SPFs?
- Are there any projects with crash type/severity implications you think we should include beyond the following?
  - NCHRP 17-54: Consideration of Roadside Features in the HSM
  - NCHRP 17-58: Prediction Models for Six-Lane and One-Way Arterials
  - NCHRP 17-62: Improved Prediction Models for Crash Types and Severities
  - NCHRP 17-68: Intersection Crash Predictions for the HSM
  - NCHRP 17-70: Development of Roundabout Crash Prediction Models
  - NCHRP 17-73: Systemic Pedestrian Safety Analysis
  - NCRHP 17-77: Guide for Quantitative Approaches to Systemic Safety Analysis
  - NCHRP 17-81: Proposed Macro-Level Safety Planning Analysis Chapter
  - NCHRP 17-84: Pedestrian and Bicycle SPFs for the HSM
  - NCHRP 17-85: Development and Application of Crash Severity Models for HSM
  - NCHRP 17-92: Developing SPFs for Rural Two-Lane Incorporating Speed
  - NCHRP 17-93: Updating SPFs for Data Driven Safety Analysis

Task 4: Develop a Communication Guide for explaining HSM safety analysis to non-safety professionals

Communication Guide and Handout

- Designed to help technical staff communicate complex safety analysis concepts to non-technical audiences
- Delivered annotated outline of comm guide
- Delivered draft of comm guide text
- Next step: Approval, layout, design companion handout

PFS Project Idea Repository

- Last meeting
  - Updated Part C Reference Guide for Predictive Methods – update: FHWA Geometric Design Lab tentatively plans to update when appropriate
  - Incorporating Safe System Approach into HSM
  - Evaluating impact of “adoption” of the HSM among the states
  - HSM Screening Tool that can be used to determine if the HSM can be used on a project-level, and for what purpose.
    - Note, older report funded by PFS but perhaps still relevant to this topic: Scale and Scope of Safety Assessment Methods in the Project Development Process
  - Assess state DOT’s safety analysis guides/manuals – recommend holding until any next steps from the RFI are taken

PFS Project Idea Repository

- SPF Clearinghouse
  - Potential to resurrect this concept initiated by the PFS around 2014
  - Brought up for consideration by FHWA GDL staff
  - Current resource by private entity: http://spfclearinghouse.org/
  - Will include some informational slides in the meeting minutes distribution

General DDSA Updates

Vulnerable Road User (VRU) Safety Assessment Webinar – State Examples

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Apr 03, 2023 (see recording link below)

This FHWA-hosted webinar highlights examples of potential Vulnerable Road User (VRU) Safety Assessment activities from three State agencies around the country. Texas, Iowa, and North Carolina covered topics including the VRU Safety Assessment's relationship to existing safety plans, safety analysis methods, analysis tools, and consultation efforts. There was also a Q&A session between attendees and the presenters.

Panelists

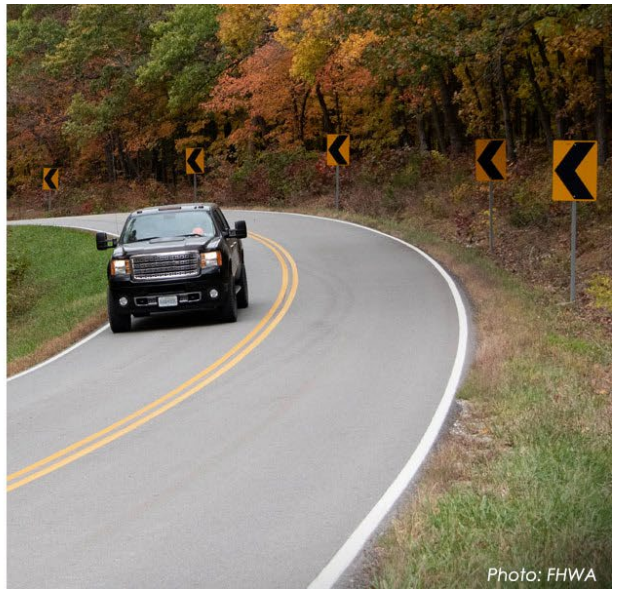
- Tamara Redmon, FHWA
- Leticia Estavillo, Texas DOT
- Carl Seifert, Jacobs, Contractor for Texas DOT
- Sam Sturtz, Iowa DOT
- Brian Mayhew, North Carolina DOT

Webinar Resources

- Video Recording (MP4)

EDC7

- **Nighttime Visibility for Safety**
  - Initiative underway with states' baseline and goals set
  - Innovation Website
  - NEW: 2023 update to the FHWA Lighting Handbook
- **Next Generation TIM: Technology for Saving Lives**



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DDSA How-To Guides

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Completed:

Traffic Impact Analyses

Intersection Control Evaluation

Road Diets

Under Development:

- Incorporating DDSA into Interstate Access Requests

Source: FHWA

DDSA How-To Guides

Under Development: Incorporating DDSA into Interstate Access Requests (IARs)

Purpose:

1. Describes the role of data-driven safety analysis in IARs.
2. Presents different safety analysis methods/options and tools that are adaptable to a range of project contexts and characteristics.
3. Illustrates DDSA to support IARs through multiple case studies.

Systemic Safety Project Selection Tool

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- Update in progress, scheduled to be complete in 2023
- Updated methodologies and best practices, case studies
- Updates to systemic safety training
- Risk assessment framework and risk factor matrix

Source: FHWA

Systemic Safety Project Selection Tool

Some interest in a database for national risk factors.

Practitioners have expressed desire for a consortium of information on data such as risk factors (synthesis will be available) used for systemic safety analysis, methods to derive safety data, SPF and calibration factors, and other updated data needs to support HSM2 and other DDSA approaches.

Potential to explore a concept to provide a national clearinghouse of safety data for practitioners or update the CMF Clearinghouse to include additional data.

Source: FHWA

Local Road Safety Plan DIY Site

Source: FHWA

https://highways.dot.gov/safety/local-rural/local-road-safety-plans

Updated:

- More videos
- LRSP Template with added SS4A components
- Example Plan list (now table)

More updates in future!

Safety and NEPA Case Studies

Source: FHWA

- Case Studies and Noteworthy Practices Introductory Document
  - https://highways.dot.gov/safety/safety-and-nepa-case-studies-and-noteworthy-practices-introductory-document
- Colorado's I-25 South Gap
  - https://highways.dot.gov/safety/safety-and-nepa-case-studies-and-noteworthy-practices-colorados-i-25-south-gap
- Incorporating Safety in to Project Purpose and Need
  - https://highways.dot.gov/safety/safety-and-nepa-case-studies-and-noteworthy-practices-incorporating-safety-project-purpose
- Kentucky's Second Street Corridor (US 60) Complete Street and Road Diet Project
  - https://highways.dot.gov/safety/safety-and-nepa-case-studies-and-noteworthy-practices-kentuckys-second-street-corridor-us-60
- North Dakota's US 85 Expansion
  - https://highways.dot.gov/safety/safety-and-nepa-case-studies-and-noteworthy-practices-north-dakotas-us-85-expansion

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Caltrans usRAP Pilot Effort

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In support of the Caltrans Road Safety Action Plan, Task 1.3:

- **“Develop a statewide decision-making framework for proactively identifying, analyzing, and prioritizing roadway safety investment.”**
- **Caltrans seeks to “Pilot a state-highway safety rating system based on the safety assets and geometric features modeled on the usRAP system.”**

Caltrans Road Safety Action Plan

Caltrans usRAP Pilot Effort

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FHWA is providing technical assistance to support the pilot effort for Caltrans Districts 1 and 2, including:

- **usRAP Data Collection Training.**
- **Data Integration and Collection.**
- **usRAP Implementation (Optional).**

Technical Assistance is Available

FHWA has opportunities available to provide technical assistance for DDSA activities. This assistance can include at minimum:

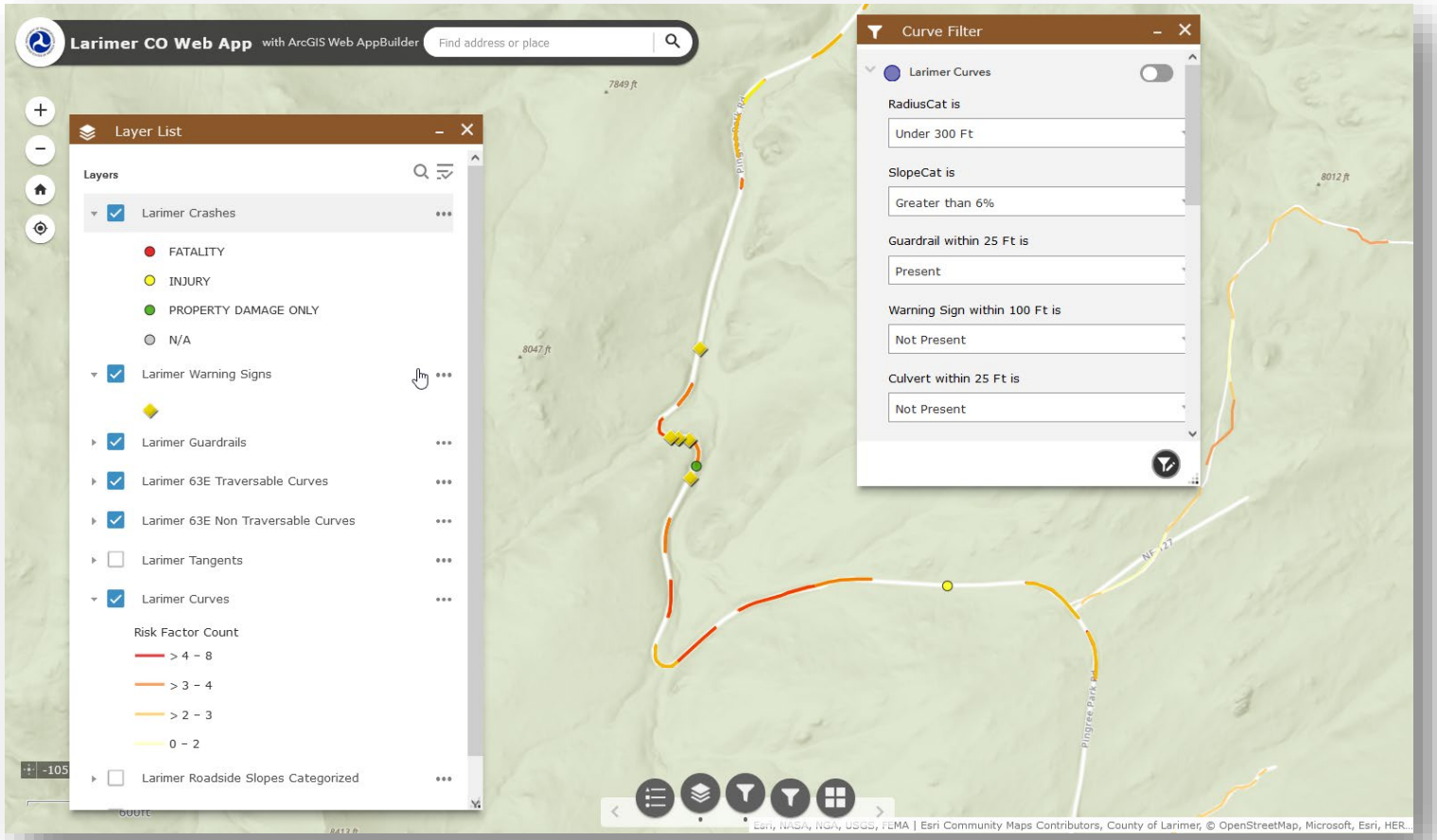
- Determining goodness of fit for a safety performance function,
- Systemic safety analysis including data summarization and crash tree development to identify focus crash type, facility type, and risk factors,
- Economic analysis of various countermeasures,
- Contacting agencies to ascertain information on their level of DDSA implementation,
- LRSP plan writing and editing support

For any state, local, regional, Tribal partner

Federal Lands Highway – GIS and Systemic Safety

A Practical Framework for Safety Analysis in GIS – Methods for Assessing Safety in Limited Data Environments

- Research project and case studies for agencies with limited existing data
- Use “open-source” data and GIS methods to derive risk factors



Source: FHWA

Federal Lands Highway – GIS and Systemic Safety

A Practical Framework for Safety Analysis in GIS – Methods for Assessing Safety in Limited Data Environments

- Several case studies with counties, MPOs, Tribes, FLMAs
- Potential for assisting rural agencies and SS4A
- Presentations at GIS-T, TRB Low Volume Roads conference, ITE Annual Meeting, Rural Road Safety Summit
- Contact: Matt Hinshaw

Source: FHWA

Turner-Fairbank research updates

Complete Streets – Safety Analysis (Turner-Fairbank)

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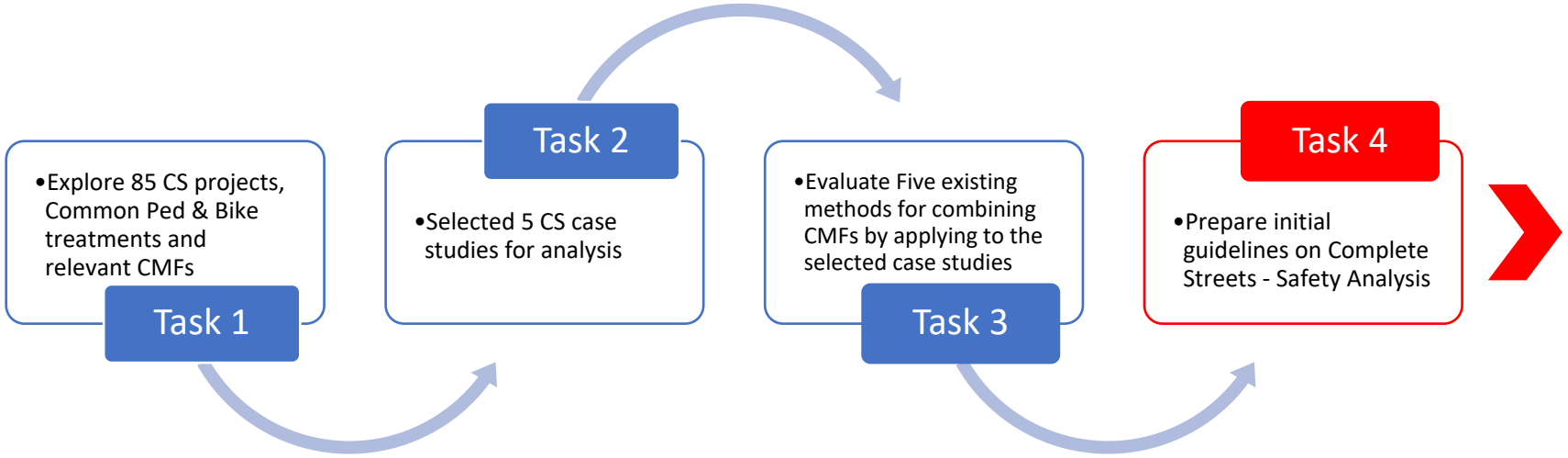
❖ Purpose

Provide practitioners and stakeholders with a primer that identifies and describe best practice in quantifying the safety performance effects of multiple safety treatments in CS projects

❖ Scope and Progress



Results & Findings

- Identified common combination of Ped&Bike treatments on CS projects.
- Identified 718 CMFs related to the CS treatments.
- Identified the CMF combining methods that perform best
- Identified existing limitations for applying CMFs based HSM methods.
- Proposed possible alternative methods applicable to CS projects.

❖ Webinar and Final Publication Date

August/September 2023

Separated Bicycle Lane Research

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- **Developing Crash Modification Factors for Separated Bicycle Lanes**
  - https://highways.dot.gov/research/publications/safety/FHWA-HRT-23-025
  - Karen Dixon's presentation earlier this week
  - CMFs in process of being added to Clearinghouse
  - **Considering updates to Proven Safety Countermeasures (Bicycle Lanes)**

IHSDM Updates and Potential Impacts from HSM2

IHSDM Update & Discussion

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Software

- Concluded software development in Sept. 2021 (IHSDM 2021; v. 17.0.0)
- Tech Support by FHWA Geometric Design Lab (GDL) will continue through at least September 2024, but essentially as long as agencies are still using the IHSDM software
- See "*FHWA's Future Plans for the Interactive Highway Safety Design Model (IHSDM)*": https://highways.dot.gov/sites/fhwa.dot.gov/files/FHWA-HRT-23-017.pdf

Training (FHWA-NHI-380100)

- Virtual training in a blended web-conference training format (self-paced modules + instructor-led modules via webinar)
- Est. course length is 14 hours
- Cost is $75
- LINK

Also, GDL plans to offer free training webinar(s) to walk users through how to use IHSDM to apply HSM2 models (including limitations).

IHSDM Flyer

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Available here

FHWA's Future Plans for the Interactive Highway Safety Design Model (IHSDM)

IHSDM

IHSDM Technical Support

The Federal Highway Administration (FHWA) has discontinued IHSDM software development. However, FHWA will continue to provide free technical support via Geometric Design Laboratory (GDL) staff through **at least** September 2024, but essentially as long as agencies are still using the IHSDM 2021 (version 17.0.0) software.

Based on the current schedule, it is likely that the American Association of State Highway and Transportation Officials (AASHTO) will not publish the *Highway Safety Manual (HSM)* second edition *(HSM2)* until at least 2024. Even after publication, agencies might need some time to transition from using *HSM* first edition *(HSM1)* methods/models to the new and/or recalibrated *HSM2* models (e.g., to calibrate the new *HSM2* models; to "vet" the new models for their use).[1] During that transition period (which will vary by agency), FHWA will continue to provide IHSDM/*HSM* support.

Since the *HSM2* will include models for some facility types and/or crash types that differ significantly from the *HSM1* form (e.g., new pedestrian and bicycle crash models), some parts of the IHSDM Crash Prediction Module (CPM) will become obsolete over time. At some point, the entire IHSDM CPM may become obsolete. Again, FHWA will provide IHSDM technical support to users until then.

FHWA's IHSDM-Related Activities Beyond the 2021 Release

Although FHWA will no longer carry out IHSDM software development, it will continue to provide the following:

- Free ***technical support*** via GDL staff through at least September 2024 (contact IHSDM technical support staff via email at IHSDM.Support@dot.gov or the Help Line at 202–493–3407). The FHWA Resource Center (RC) will also continue to provide IHSDM and *HSM* related technical assistance to agencies.
- ***Training*** sessions for IHSDM users via the FHWA RC (contact David Petrucci at david.petrucci@dot.gov) and the National Highway Institute (contact Thomas Elliott at thomas.elliott@dot.gov).
- ***IHSDM user group*** meetings and webinars, with a focus on agency applications and IHSDM case studies.
- Maintenance of the current FHWA ***IHSDM website*** (https://highways.dot.gov/research/safety/interactive-highway-safety-design-model/interactive-highway-safety-design-model-ihsdm-overview), which provides a means for users to download the IHSDM 2021 release and to obtain other information of interest.[9]

For More Information
Visit https://bit.ly/IHSDM-Overview.

U.S. Department of Transportation
Federal Highway Administration

Turner-Fairbank Highway Research Center

Source: FHWA

IHSDM Update & Discussion

HSM2 Implications for IHSDM

- **Freeways (Ch. 17) – workarounds required for:**
  - Change from bi-directional to unidirectional models
    - Changes could be applied in IHSDM via the IHSDM Administration Tool (Model Data Sets) by modifying the intercept (and other) coefficients of the SPFs. IHSDM data input would still need to be bi-directional, with the direction to be evaluated 'duplicated' in the other direction.
  - Changes to the freeway segmentation process (e.g., speed-change lane segments longer than 0.3 miles, and treatment of horizontal curves):
    - For IHSDM "location-based" data input (which automatically segments the highway), it is likely that segmentation process changes can be incorporated, but with additional effort required by the user.
- **Single-state calibration:**
  - IHSDM Administration Tool can be used to input new coefficients for models currently in IHSDM.

IHSDM Update & Discussion

HSM2 Implications for IHSDM (cont.)

- **New HSM2 models:**
  - Models developed under NCHRP projects 17-58 (6+ lanes and 1-way urban/suburban arterials), 17-68 (intersections not covered in HSM1) and 17-70 (roundabouts) were previously implemented in IHSDM. Any recent updates to SPF coefficients can be incorporated via IHSDM configuration files.
  - New (RAP-based) pedestrian and bicycle models (NCHRP 17-84) cannot be incorporated into IHSDM. Also, some changes will be needed to exclude 'old' pedestrian and bicycle models from IHSDM.
- **Part C Calibration:**
  - The IHSDM AdminTool includes a Calibration Utility to assist users in estimating and/or entering calibration factors. Users will still be able to enter/ estimate calibration factors for SPFs already in IHSDM, but not for the new ped and bike models. It is unlikely that the updated calibration procedure (future HSM2 Ch. 13) can be incorporated.

Resource Center training updates

U.S. Department of Transportation
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RESOURCE CENTER
Office of Innovation Implementation

FHWA Training Related to the Highway Safety Manual

AASHTO HSM Steering Committee

June 2023

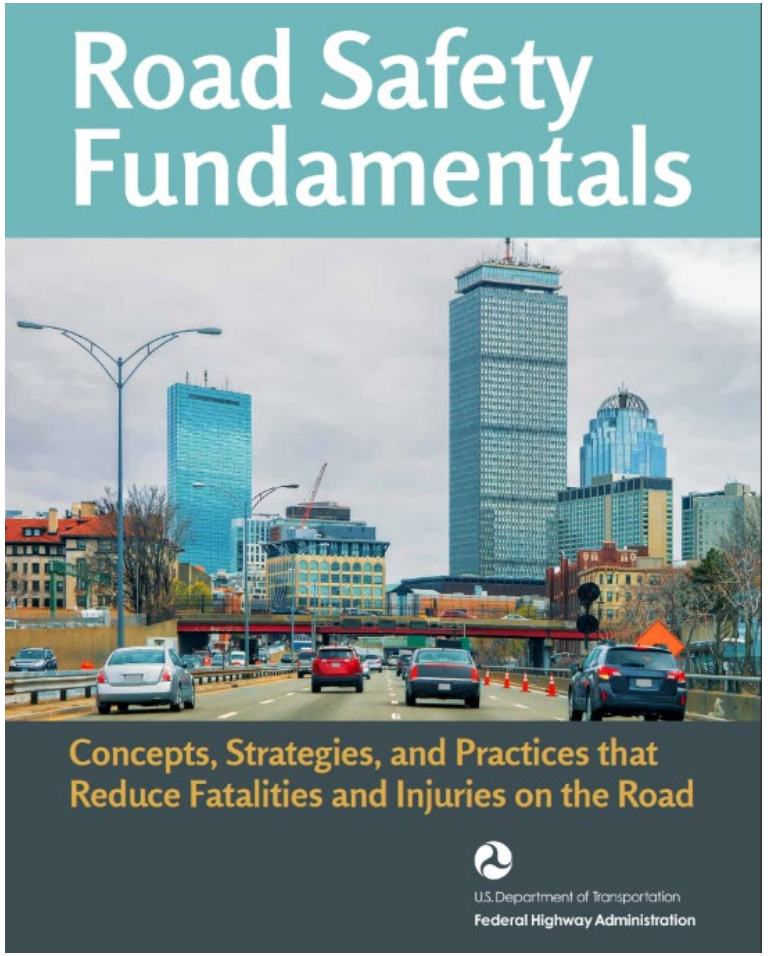
Summary of Courses

- Road Safety Fundamentals (NHI-380124A)
- Introduction to Data Driven Safety Analysis (DDSA) (NHI-380125)
- HSM Practitioner's Guide for Geometric Design Features (FHWA Resource Center)
- Systemic Safety User Guide Training* (FHWA HQ)

Road Safety Fundamentals

- Unit 1. Foundations of Road Safety
  - Chapter 1: Context of Road Safety
  - Chapter 2: Road Safety Through the Years
  - Chapter 3: Multidisciplinary Approaches
  - Chapter 4: Road Users

- Unit 2. Human Behavior and Road Safety
  - Chapter 5: Understanding Human Behavior
  - Chapter 6: Changing Human Behavior



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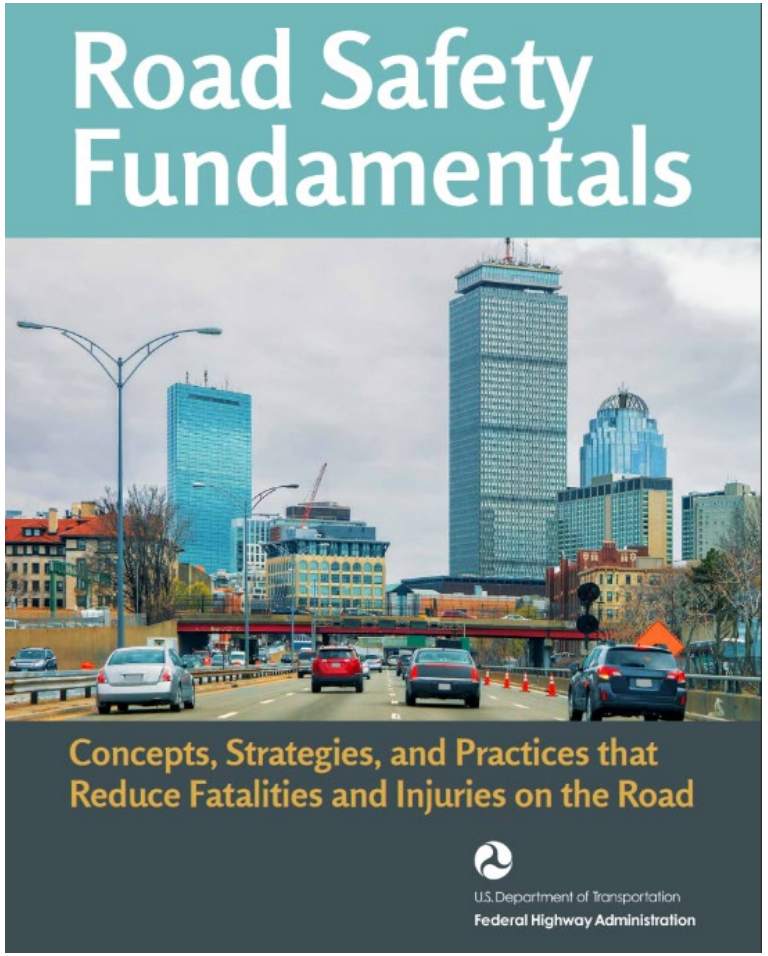
https://www.nhi.fhwa.dot.gov/course-search?tab=0&key=road%20fundamentals&sf=0&course_no=380124A

Road Safety Fundamentals

- Unit 3. Measuring Safety
  - Chapter 7: Importance of Safety Data
  - Chapter 8: Types of Safety Data
  - Chapter 9: Improving Safety Data Quality

- Unit 4. Solving Safety Problems
  - Chapter 10: Road Safety Management Process
  - Chapter 11: Site-Level Safety Management
  - Chapter 12: System-Level Safety Management



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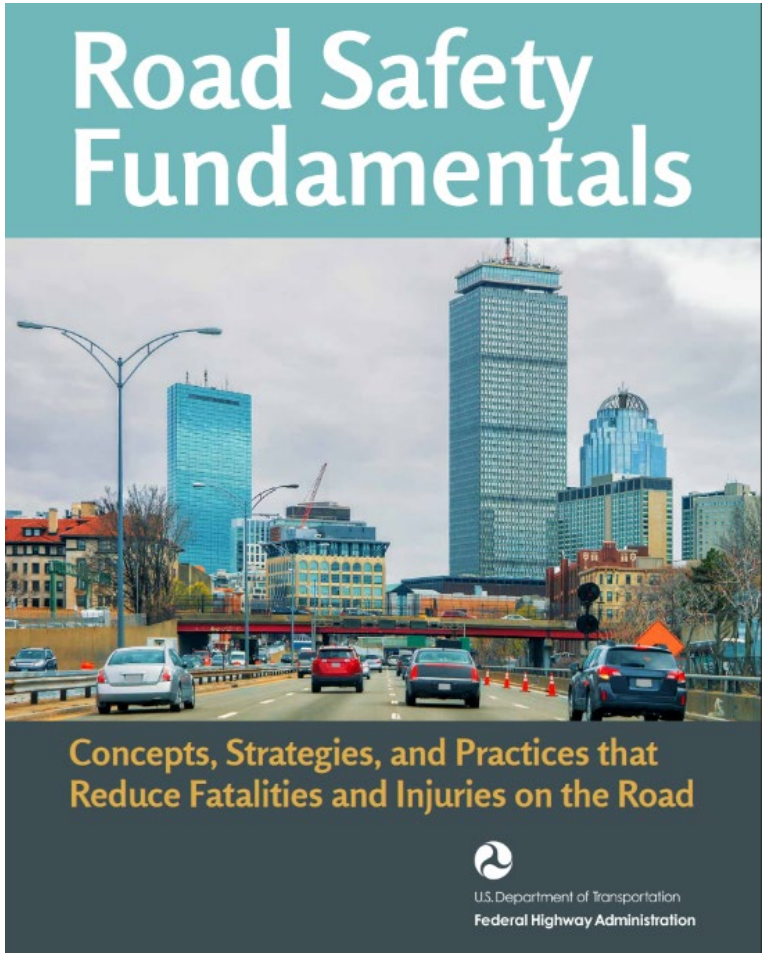
Road Safety Fundamentals

- Unit 5. Implementing Road Safety Efforts
  - Chapter 13: Who Does What
  - Chapter 14: Road Safety Research
  - Chapter 15: Strategic Communications
  - Chapter 16: Advancing Road Safety



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Introduction to DDSA

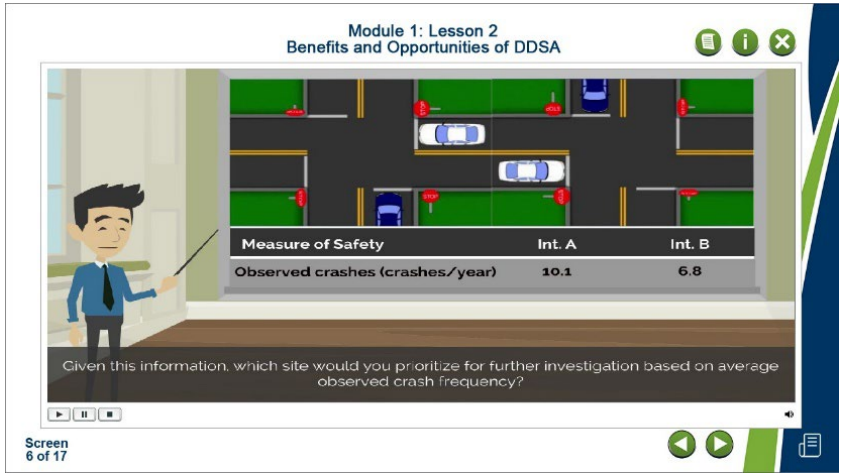
- Module 1: Foundations of Road Safety
  - Lesson 1: Context of Road Safety
  - Lesson 2: Road Safety Through the Years
  - Lesson 3: Multidisciplinary Approaches
  - Lesson 4: Road Users
- Module 2: Human Behavior and Road Safety
  - Lesson 5: Understanding Human Behavior
  - Lesson 6: Changing Human Behavior
- Module 3: Measuring Safety
  - Lesson 7: Importance of Safety Data
  - Lesson 8: Types of Safety Data
  - Lesson 9: Improving Safety Data Quality

https://www.nhi.fhwa.dot.gov/course-search?tab=0&key=highway%20safety%20manual&sf=0&course_no=380125

Introduction to DDSA

- Module 4: Solving Safety Problems
  - Lesson 10: Road Safety Management Process
  - Lesson 11: Site-Level Safety Management
  - Lesson 12: System-Level Safety Management

- Module 5: Implementing Road Safety Efforts
  - Lesson 13: Who Does What
  - Lesson 14: Road Safety Research
  - Lesson 15: Strategic Communications
  - Lesson 16: Advancing Road Safety



https://www.nhi.fhwa.dot.gov/course-search?tab=0&key=highway%20safety%20manual&sf=0&course_no=380125

HSM Practitioner's Guide for Geometric Design Features

- Introduction and Background

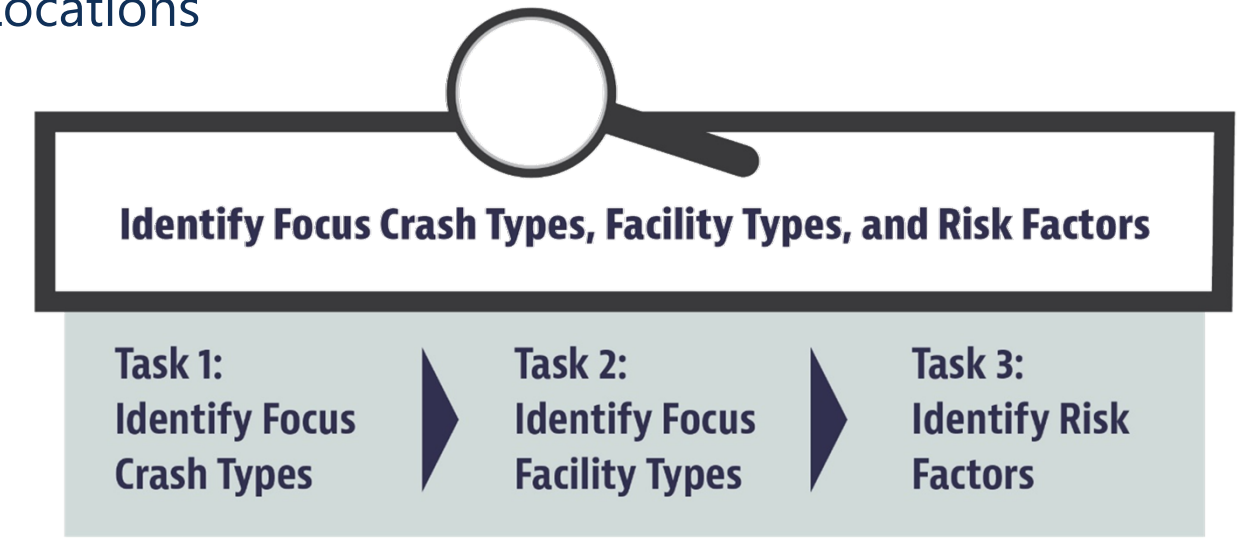
- Predicting Highway Safety for:
  - Two-lane Rural Highway Segments
  - Horizontal Curves On Rural Two-lane Highways
  - Rural Two-lane Intersections
  - Multilane Rural Undivided And Divided Highway Segments
  - Rural Multilane Highway Intersections
  - Multilane Urban Streets And Applying Crash Modification Factors
  - Multilane Urban Suburban Intersections

Systemic Safety User Guide Training

- Overview of Systemic Approach to Safety
  - Systemic Safety: Definition
  - Reasons for Systemic Approach
  - Example: Fatal Crash Locations
  - Systemic Approach
  - Systemic Safety Planning
  - Site-Specific vs. Systemic
  - Benefits of Systemic Projects
  - Systemic Safety Project Selection
  - A systemic illustration…

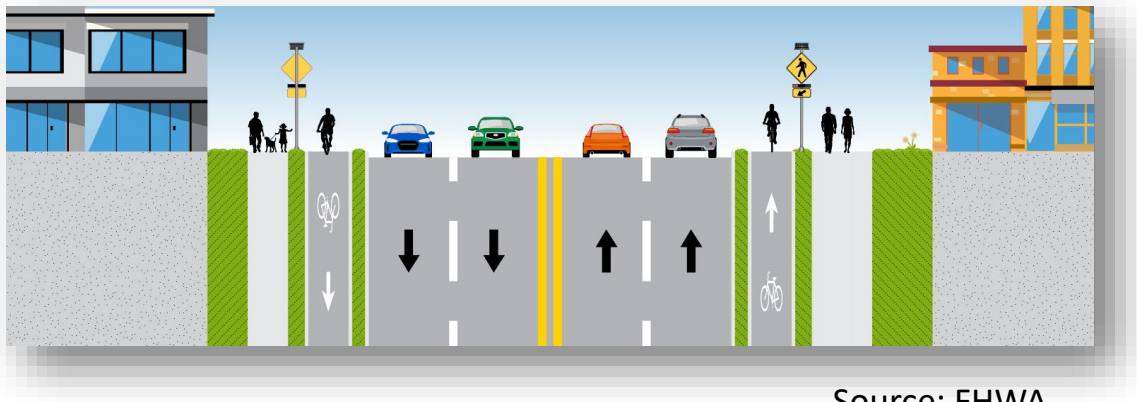
Systemic Safety User Guide Training

- Element 1: Systemic Safety Planning Process
  - Systemic Safety Planning Process
  - Step 1: Identify Focus Crash Types, Facility Types, and Risk Factors
  - Step 2: Screen and Prioritize Candidate Locations
  - Step 3: Select Countermeasures
  - Step 4: Prioritize Projects
- Task Case Studies
  - Minnesota: Ped Bike Safety Case Study
  - Thurston County, Washington
  - Ohio: Intersection and Curve Case Study



New Course – Planning & Designing Complete Streets

- Introduces participants to the means of incorporating Complete Streets into the planning process
- Blended web-based and instructor-led
- Subject to FHWA Resource Center availability (upon request)
  - May be added to NHI's course catalog in fall



Source: FHWA

“Improving Road Safety for All Users…” Request for Information (discussion)

ZERO IS OUR GOAL

A SAFE SYSTEM IS HOW WE GET THERE

U.S. Department of Transportation

Federal Highway Administration

Improving Road Safety for All Users on Federal-Aid Projects Request for Information (RFI)

Background

- National Roadway Safety Strategy and the Moving to a Complete Streets Design Model: A Report to Congress on Opportunities and Challenges include commitments and strategies to address national crisis of traffic fatalities and serious injuries
  - Adopt the Safe System Approach
  - Develop standards and guidance that promote safety for all users
  - Make Complete Streets the default approach
- Goal of Zero Fatalities and Serious Injuries
  - Prioritize safety in all Federal highway investments and projects

Funding and Regulations

- Highway Safety Improvement Program (HSIP) (23 U.S.C. 148) only 6% of Federal-Aid Highway Program
  - Specific requirements to address safety
  - HSIP alone will not achieve goal of zero fatalities
- Other Federal-aid formula funds can be used for safety improvements
  - No prescribed process for incorporating safety
- U.S.C. and CFR require consideration of safety
  - 23 U.S.C. 109 – provide facilities that are conducive to safety and consider the AASHTO *Highway Safety Manual* (HSM) when developing design criteria
  - 23 U.S.C. 134 and 135 – planning processes that provide for safety of all users
  - 23 CFR 625 – provide highest practical and feasible level of safety

Two Main Sections

- Design Standards for Highways (NHS System)
- Safety Performance Assessments

Request for Information (RFI)

- Request Comments on:
  - Whether changes to FHWA's Design Standards regulation or other FHWA regulations are needed to better serve all users;
  - How the safety performance of Federal-aid projects should be assessed; and,
  - How to include features that improve safety performance across Federal-aid projects.
- Twenty-seven questions in six topic areas:
  - Improving Road Safety for All Users;
  - Design Standards for the NHS;
  - **Safety Performance Assessment Applicability;**
  - **Conducting a Safety Performance Assessment;**
  - **Safety Performance Assessment Process Evaluation and Outcomes; and,**
  - **Safety Performance Assessment Implementation Considerations**

Post-RFI Actions

- Use information gathered to:
  - Consider future rulemaking options
  - Develop guidance or other resources (case studies, informational briefs, etc.) related to design standards or for safety performance assessments on Federal-aid projects
- Support BIL implementation across programs
- Inform Complete Streets initiative activities
  - Provide additional recommendations for addressing the five opportunity areas in the Complete Streets Report to Congress

Discussion

- For purposes of this RFI and as referenced throughout the questions, a safety performance assessment involves the application of analytical tools and techniques for quantifying the potential effects of transportation investment decisions in terms of crash frequency and severity, or a formal qualitative examination of safety performance such as an RSA.

Request for Information (RFI)

- Twenty-seven questions in six topic areas:
  - Improving Road Safety for All Users;
  - Design Standards for the NHS;
  - **Safety Performance Assessment Applicability;**
  - **Conducting a Safety Performance Assessment;**
  - **Safety Performance Assessment Process Evaluation and Outcomes; and,**
  - **Safety Performance Assessment Implementation Considerations**

Request for Information (RFI)

Agency Type	**Comments**
Advocacy	16
Concerned Citizen	50
Industry Organization	13
Local Agency	10
Regional Agency	8
State Department of Transportation	26
Other	2
Total	**125**

Safety Performance Assessment Applicability

- 13. For which current projects (i.e., by improvement type, funding program/level, facility type, etc.) are safety performance assessments or analyses conducted in your State?
- 14. To what extent is the safety performance assessed on non-HSIP funded projects?
- 15. What policies or procedures on conducting project-specific safety performance assessments and analyses does your agency have? Provide examples and citations to relevant laws, regulations, policies, procedures, or other materials where possible.

Conducting a Safety Performance Assessment

- **16. What methods, tools, and types of safety performance assessments are used to analyze project-specific safety performance? What are the minimum data and analysis requirements that should be considered on how to conduct a safety performance assessment?**
- 17. With whom do States engage (i.e., counties, cities, MPOs, rural planning organizations, and other political subdivisions) when assessing safety performance? How do States engage the public or use the safety performance assessment results to communicate to the public using inclusive and representative processes?
- 18. How are safety performance assessments integrated into the overall project development cycle? At which stage(s) of the project development process (e.g., planning and programming, environmental analysis, design, operations and maintenance) are project-specific safety performance assessments conducted? Are evaluations conducted after the project has been implemented? Responses may include examples of projects where safety performance assessments were conducted and how they informed the final project deliverables.
- 19. How is safety performance assessed or considered at the system level planning or early transportation project identification/prioritization stage? How is network screening used to inform project decisionmaking?

Safety Performance Assessment Process Evaluation and Outcomes

20. What indicators or measures have been used to determine the effectiveness of safety performance assessments?

21. To what extent is the safety performance assessment or analysis used to inform project decisionmaking? How is safety performance weighted in relation to factors such as environmental impact or traffic congestion? Are there requirements to include countermeasures or evaluation of alternative designs that are expected to improve safety performance? If yes, please provide examples of the requirements or projects where the safety performance assessment led to the implementation of countermeasures and strategies that improved safety performance.

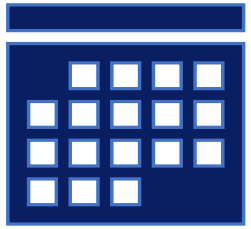
22. How is safety performance evaluated after the project is implemented? To what extent are countermeasures, alternative designs, or strategies to improve safety performance replicated on other projects, based on past project evaluations?

Discussion

- Is any research currently in the works that could be helpful for assessing scale and scope of safety assessments? What other research may be needed?
- What research is realistically possible in gauging the effectiveness of safety assessments in project development, including potential tools, methods, or approaches used for them, as it relates to outcomes (reduced fatal and serious injury crashes)?
- What guidance could be useful for practitioners?
- For state DOTs, what has worked well in regards to substance of safety assessments, timing during planning/project development, scale/scope of the assessment depending on scale/scope of the overall project?

Safe Streets and Roads for All (SS4A)

SS4A NOFO Is Still Open



Notice of Funding Opportunity is now **OPEN**

Apply by July 10, 2023, at 5:00 p.m. EDT **(no late applications will be accepted)**

Additional resources about SS4A and the NOFO can be found at https://www.transportation.gov/grants/SS4A

SS4A Overview: Eligibility

Eligible Recipients

- Metropolitan planning organization (MPOs)
- Political subdivision of a State
- Federally recognized Tribal government
- Multijurisdictional groups comprised of the above

Eligible Activities

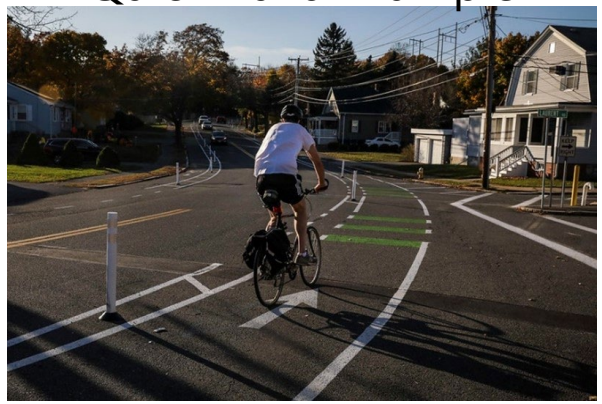
- Develop a Comprehensive Safety Action Plan
  - Develop or complete an Action Plan
  - Conduct supplemental planning
  - Carry out demonstration activities
- Planning, design, and development activities for **projects and strategies** identified in an Action Plan
- Implement projects and strategies identified in an Action Plan

Planning and Demonstration Activities

Action Plan

- Develop or complete a Comprehensive Safety Action Plan
- 8 components to an Action Plan

Quick Build Example



Source: Solomon Foundation

Supplemental Planning

- Topical safety plans
- Road safety audits
- Additional safety analysis and data collection
- Targeted equity assessments
- Follow-up stakeholder engagement

Demonstration Activities

- Feasibility studies using quick-build strategies
- Pilot programs for behavioral or operational activities
- Pilot programs for new technology
- Manual on Uniform Traffic Control Device (MUTCD) engineering studies

What's New: General

- Applications will be completed through Valid Eval
- "Planning and Demonstration" grants expanded on former "Action Plan" grants
- Updated definition of underserved communities
  - Any Tribal land;
  - Any territory; or
  - USDOT Equitable Transportation Community Explorer **or** Climate and Economic Justice Screening Tool
- Two anticipated award announcements:
  - October 2023: Initial Planning and Demonstration Grant Awards
  - December 2023: Implementation Grant Awards, and remaining Planning and Demonstration Grant Awards

What's New: Planning and Demonstration

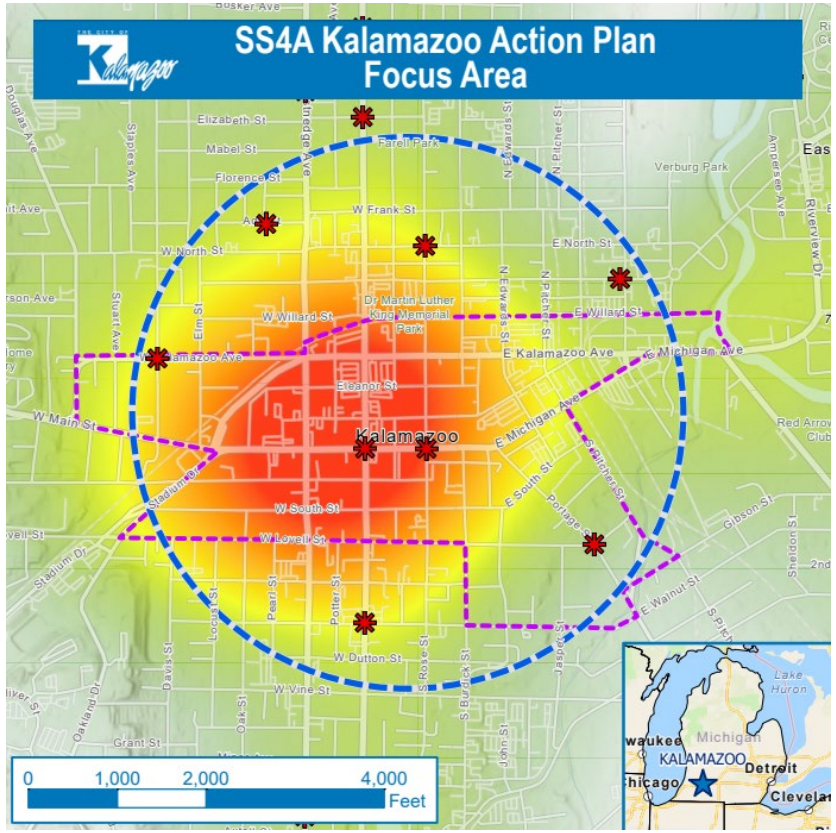
- Clarification of eligible activities, with new focus area on "demonstration activities" (NOFO Sections A and C)
- Expected award ranges now $100,000 to $10 million (Section B.3)
- Flexibility for longer period of performance (Section B.4)
- Revised selection criteria for additional safety context (Section E)
- **Those interested in developing an Action Plan are encouraged to include supplemental planning and demonstration activities**
- FY 2022 Action Plan Grant recipients may apply for supplemental planning and/or demonstration activities while completing a plan

Kalamazoo, Michigan: $750,000 Action Plan

The award will be used by the City of Kalamazoo to **build upon the existing safety action plan** through data analysis to improve safety, and **pilot testing** of countermeasures to determine local effectiveness.

Project Highlights:

- **Intersection analysis** of pedestrian safety and crashes
- Development of **sidewalk safety** and **bus stop safety** plans
- Key corridor **lighting study** and development of improvement plan
- Mini-Roundabout, two-way cycle track, and protected bike facilities **pilots**.



Source: Kalamazoo, MI

What's New: Implementation

- Expected award ranges now $2.5 million to $25 million (Section B.3)
- Encouraging applicants to also bundle supplemental planning and/or demonstration activities with their project and strategy requests
- Added selection criteria to evaluate supplemental planning and demonstration activities separate from projects and strategies (Section E)
- Discretion to make partial awards for supplemental planning and demonstration when applicants were unsuccessful in receiving a full award (Section E)
- Revised list of additional considerations for award selection:
  - % of funds to underserved communities (also in FY 2022 NOFO)
  - Rural areas
  - Supports awardee diversity
  - Federal funding requests under $10 million
  - Priority community in the Thriving Communities Network

SS4A Website

www.transportation.gov/grants/SS4A

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Other Research Ideas

- On integrating the Safe System Approach with HSIP
  - Opportunity was identified to “Assess Crash Severity Risk Using Level of Kinetic Energy Transfer and Speed” from 2020 report (pg. 51)
  - Desire to integrate kinetic energy models that could complement or supplement crash prediction models
  - Desire for additional capabilities (e.g. models, inputs) to assist network screening approaches
  - Potentially in scope of 17-116 (RFP out), but vague
  - Also coordinate with ACS10 (led RNS for two Safe System projects funded in FY23)

HSIS – Carol Tan

2023 Excellence in Highway Safety Data Award

.....encourages students to prepare for a career in highway safety by using high-quality data and prioritizing safety in research

— Winners to be announced in August 2023 at national ceremony —

— Stay tuned for 2024 competition, planned for kickoff in September 2023 —

https://www.hsisinfo.org/award.cfm

https://www.hsisinfo.org/pdf/2023_HSIS_DataContestFlier.pdf

FHWA Contacts

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Other General DDSA Updates (Not Covered During MYM)

Vulnerable Road User Safety Assessment

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- **Include pedestrians, bicyclists, and persons on personal conveyance**
- **Requires a data-driven process of fatal and serious injury crashes:**
  - Includes data such as location, roadway functional classification, design speed, speed limit and time of day;
  - Considers demographics of the locations of fatalities and serious injuries, including race, ethnicity, income and age; and
  - Based on the data, identifies areas as high-risk to vulnerable road users
- **Consultation including local agencies, local and regional planning organizations, and advocacy groups**
- **Results in a program of projects or strategies**
- **Required to be completed by all states by November 15, 2023, and updated with subsequent publication of a state's strategic highway safety plan**
- **FHWA Guidance**

Equity Data

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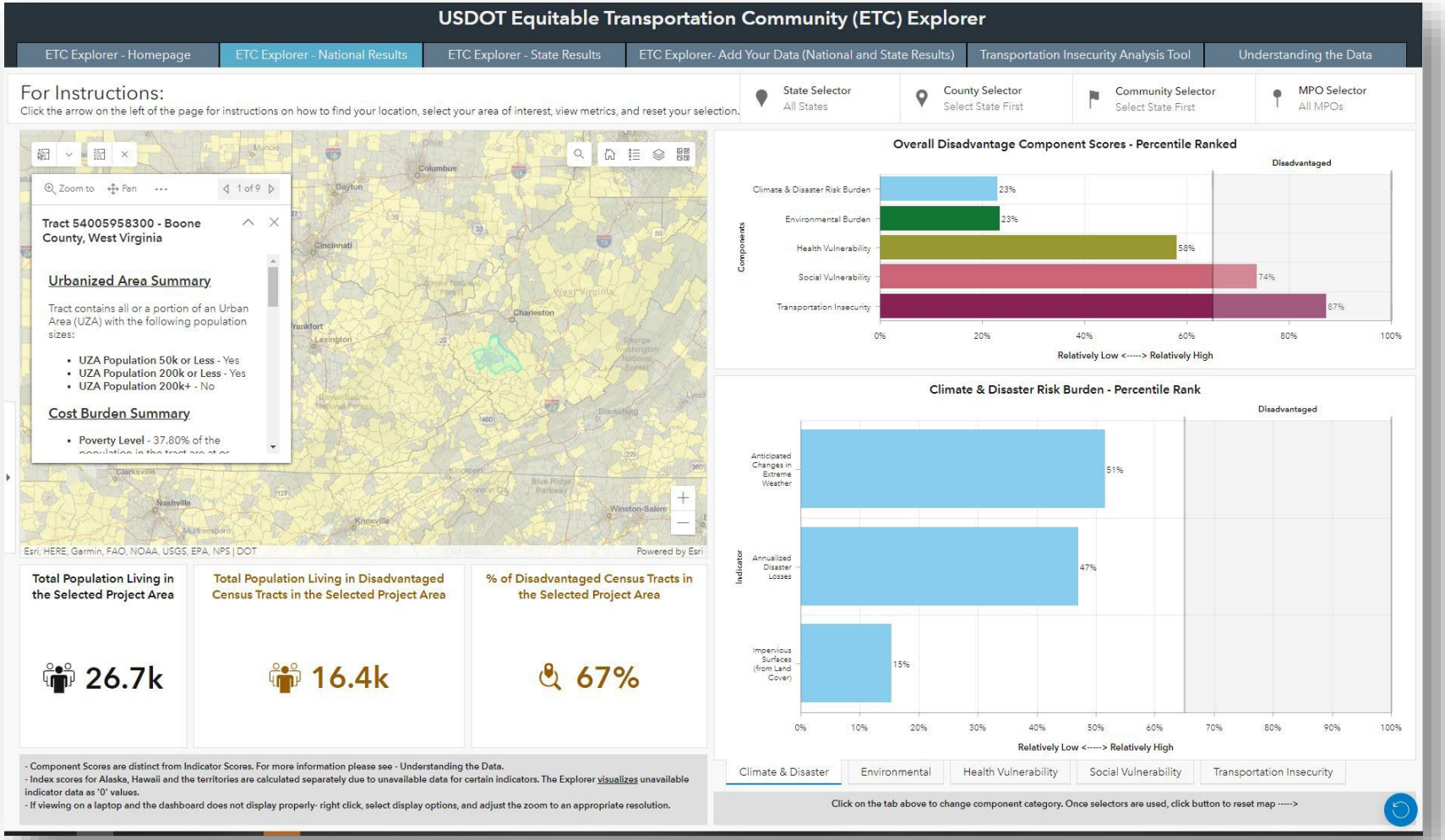
USDOT Justice40

- Updated USDOT Disadvantage Community Tool and Methodology
  - Equitable Transportation Community Explorer and Methodology



Source: USDOT

HSM PFS – Handouts and More Info Not Covered During MYM

HSM Implementation PF (22 States) – Derek Troyer/ Matt Hinshaw

1. To advance ongoing efforts by lead States to implement the HSM
2. To expand implementation to all states

- Funded over 10 products, including:
  - SPF Decision Guide: Calibration vs. Development
  - SPF Development Guide: Developing Jurisdiction-Specific SPFs
  - Scale and Scope of Safety Assessment Methods in the Project Development Process
  - State Policies and Procedures on Use of the HSM
  - Highway Safety Benefit-Cost Analysis Guide and Tool
  - Crash Costs for Highway Safety Analysis
  - Safety Performance for Intersection Control Evaluation (SPICE) Screening Tool and Guide
  - Safety Analysis Needs Assessment for TSMO Applications
  - Countermeasure Service Life Guide
  - Safety Data and Analysis Case Studies (ongoing)
  - Advancing Application of DDSA (ongoing)
    - Explore the validity of combining predictive methods
    - Develop an implementation approach for NCHRP 17-62
    - Develop a Communications Guide for explaining safety analysis to non-safety professionals

https://www.pooledfund.org/Details/Study/484

HSM2 Implementation PF – Derek Troyer/ Matt Hinshaw

- Accelerate implementation of HSM2 and related analytical tools to assess current and future safety performance of existing roadways and alternative designs, and help practitioners make more informed decisions, better target investments, and reduce fatalities and serious injuries on the nation's roadways.
- Includes activities before and after publication of HSM2
- This study will conduct research and develop products to enable States to accelerate their implementation of HSM2.
- A Technical Working Group consisting of one representative from each participating agency will help identify and prioritize the specific tasks and products.
- Requested commitment is $80,000 over five years ($16,000 per year)
- 100% SP&R waiver obtained
- FL, ID, IA, KS, KY, MO, MS, OH, PA, TX, WA have all made commitments

https://www.pooledfund.org/Details/Solicitation/1577

Safety Data and Analysis Case Studies

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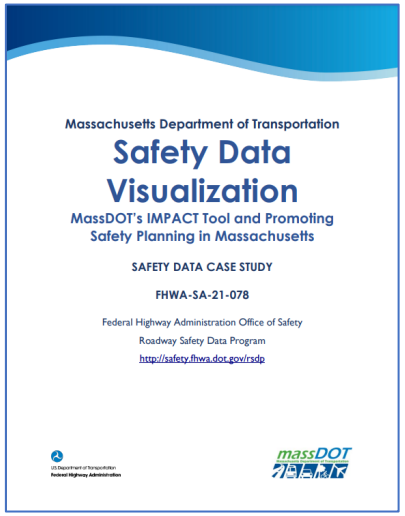


Source: FHWA

Partially Funded by the HSM Implementation Pooled Fund, TPF-5(255)

- 22 total case studies with 12 focused on HSM related applications
- Case Study Template provided by User Liaison Subcommittee ACS20(1)
- Various applications, methods, tools, and facility types
- HSM Implementation Pooled Fund Members ranked and prioritized potential case studies

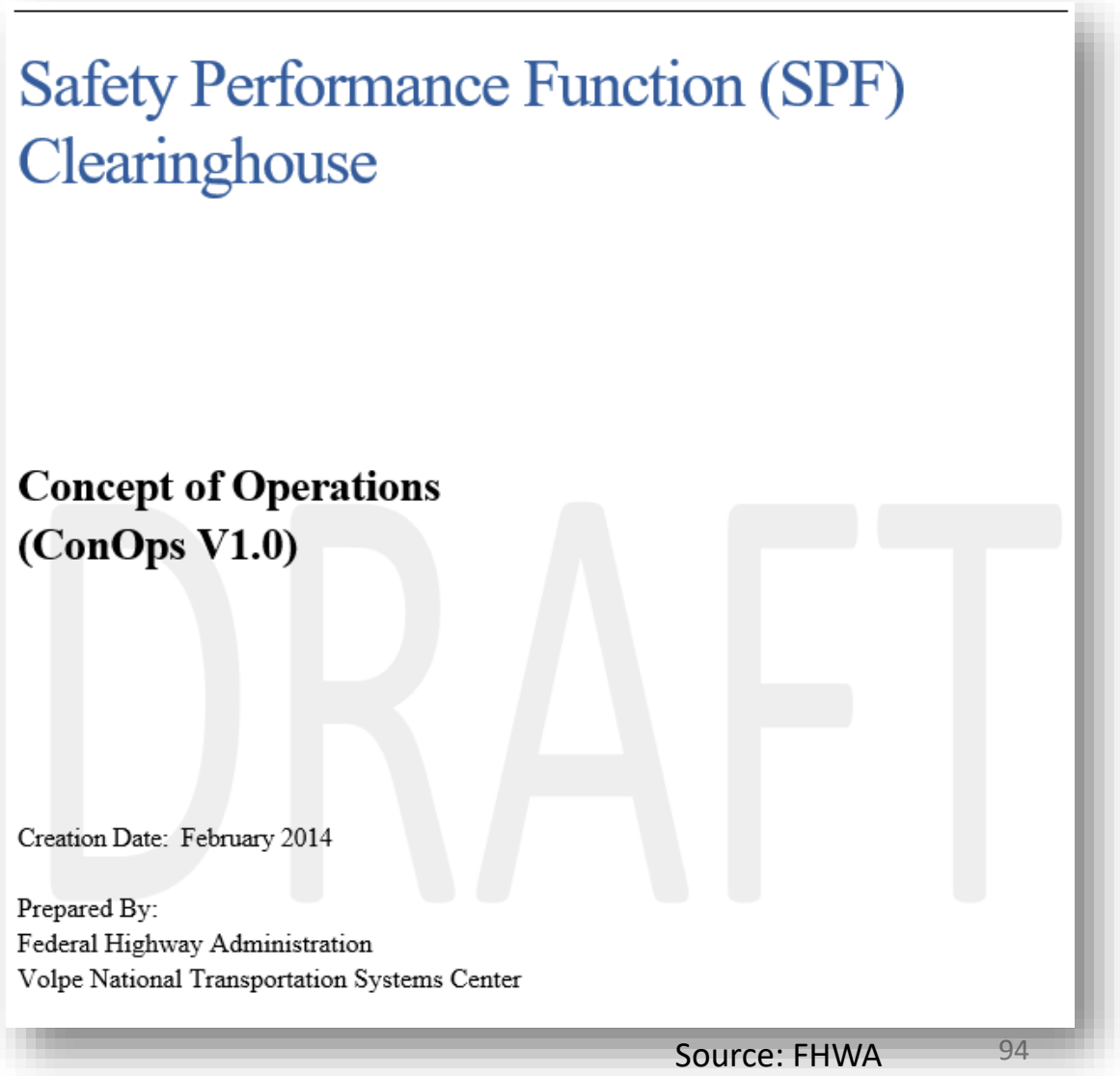
- AL: Roadway Redesign for Ped Safety
- AZ: Data Management on LRS
- CA: High Injury Network & Planning for Zero
- CT: Enterprise Data System & Processes
- FL: Safe Strides 2 Zero
- FL: MIRE Data Collection
- IN: IN SR37 Improvement
- KY: Network Screening Process
- LA: MPO Data Governance
- MA: Safety Data Visualization
- MI: I-94 Interchange Alternatives
- MN: I-35 Planning Study
- MO: Data Mgmt & Spatial Integration
- NY: Data Integration
- OH: Data Governance
- OH: Intersection Inventory
- SC: SC61 Rural Safety Project
- TX: I-37 Interstate Access Justification
- WFL: Road Safety & Traffic Assessment
- WI: SR75 Intersection Screening
- VT: Intersection MIRE Data

https://highways.dot.gov/safety/data-analysis-tools/rsdp/safety-data-case-studies

Idea of SPF Clearinghouse

Initiated by FHWA through HSM Implementation Pooled Fund February 2014: *Safety Performance Function (SPF) Clearinghouse (Concept of Operations (ConOps V1.0)*)

- The document (download here) provided scope, existing systems and processes, capability needs, system concept, operations and support description, and system overview.


Safety Performance Function (SPF) Clearinghouse

Concept of Operations (ConOps V1.0)

DRAFT

Creation Date: February 2014

Prepared By:
Federal Highway Administration
Volpe National Transportation Systems Center

Source: FHWA

Idea of SPF Clearinghouse (Cont.)

From *Safety Performance Function (SPF) Clearinghouse (Concept of Operations (ConOps V1.0)*:

"Many States are finding it challenging to develop and implement SPFs. This could be due to various components, and the lack of accurate, reliable analytics and data may be among one such components. Currently there are existing tools to support the implementation of SPFs, such as the Highway Safety Manual (HSM) and the Crash Modification Factor (CMF) Clearinghouse. The intention of the SPF Clearinghouse is to provide an additional level of statistical and policy support to state and local safety professionals beyond what is already available in the HSM and CMF Clearinghouse."

Idea of SPF Clearinghouse (Cont.)

http://spfclearinghouse.org is run by a private entity since 2015

- It is active but limited number of SPFs & information about them.

Idea of SPF Clearinghouse (Cont.)

Limitations of http://spfclearinghouse.org/

It includes a limited number of SPFs from a few US States (mostly from *SafetyAnalyst*). While the website is a useful resource for transportation professionals seeking information on SPFs, it is not comprehensive, and its effectiveness is limited by its small scope.

- Intersection: 15 SPFs
- Segment: 16 SPFs
- Ramp: 20 SPFs
- Roundabout: 1 SPF
- Total: **52 SPFs** (as of Feb. 2023)

Idea of SPF Clearinghouse (Cont.)

Limitations of http://spfclearinghouse.org/

One of the most significant limitations is the lack of standardization (i.e., a rating system). Without standardization, transportation professionals may encounter difficulties in comparing SPFs from different jurisdictions, leading to inconsistencies in their use and interpretation.

Another limitation is the lack of support and guidance for the development of new SPFs.

Unlike CMF Clearinghouse, there is currently no capability to download the existing list of available SPFs with their details.

Idea of SPF Clearinghouse (Cont.)

General benefits of a functioning SPF CH

A centralized SPF Clearinghouse could play a crucial role in improving the effective application of DDSA and the Safe System Approach:

- The availability of a central repository of SPFs (especially those targeting fatal and severe injury crashes) would provide transportation professionals with easy access to these tools, allowing for more efficient and effective roadway safety analysis and decision-making.
- Facilitate the standardization of SPF development and implementation, ensuring consistency in the application of these tools across various jurisdictions.

Idea of SPF Clearinghouse (Cont.)

Benefits of a functioning SPF CH for FHWA

FHWA would benefit significantly from a centralized SPF Clearinghouse. FHWA plays a key role in promoting and advancing DDSA and SSA, and a centralized SPF Clearinghouse would help FHWA achieve its objectives more effectively.

By providing a central repository of SPFs, FHWA would be able to promote the use of these tools more widely and ensure that they are being used appropriately.

Additionally, FHWA could use the SPF Clearinghouse to identify gaps in SPF development and implementation, and to develop strategies to address these gaps.

Idea of SPF Clearinghouse (Cont.)

Potential effects of a functioning SPF CH on future editions of HSM

HSM Part C could eventually be restructured so that it does not contain any SPFs/models at all, but rather guidance on first how to select an appropriate safety analysis approach; and then, when applicable, how to select and apply SPFs/models (e.g., from a future SPF Clearinghouse) – similar to the way HSM2 Part D will not include specific CMFs. Of course, this is very dependent on the development of a rating system for SPFs.

As with HSM2 Part D and the CMF Clearinghouse, this type of Part C restructuring has the advantage of providing access to SPFs/models "soon" after they are developed, rather than waiting for years to add a subset of new SPFs to the next edition of the HSM.

Idea of SPF Clearinghouse (Cont.)

Next steps:

Determine the current status of work initiated by FHWA through HSM Implementation Pooled Fund and also http://spfclearinghouse.org/.

Meet with involved parties.

Investigate potential continuation of outlined work under *Safety Performance Function (SPF) Clearinghouse, Concept of Operations (ConOps V1.0)* with potential collaboration with involved parties and the team behind the http://spfclearinghouse.org/ (if required).

Items Previously Shared at Annual Meeting

National Roadway Safety Strategy

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2023 MYM

Safe System Approach – Safer Roads, Safer Users, Safer Speeds

- Increase safety funding, aligned with the Safe System Approach
- Change law or policy at all levels of government, to make safety the preferred and easiest option in transportation planning, projected development, and operations
- Expand deployment of safety countermeasures
- Take actions supporting safety and equity
- Making technology deployments that align with the SSA
- Work with partners to achieve a truly systemic approach

Complete Streets

- Moving to a Complete Streets Design Model: A Report to Congress on Opportunities and Challenges notes five opportunity areas:

- **Improve data collection and analysis** to advance safety for all users;
- **Support rigorous safety assessment** during project development and design to help prioritize safety outcomes across all project types;
- **Accelerate adoption of standards and guidance** that promote safety and accessibility for all users and support innovation in design;
- **Reinforce the primacy of safety for all users** in the interpretation of design standards, guidelines, and project review processes; and,
- **Make Complete Streets FHWA's default approach** for funding and designing non-access-controlled roadways.

MIRE – Sarah Weissman Pascual

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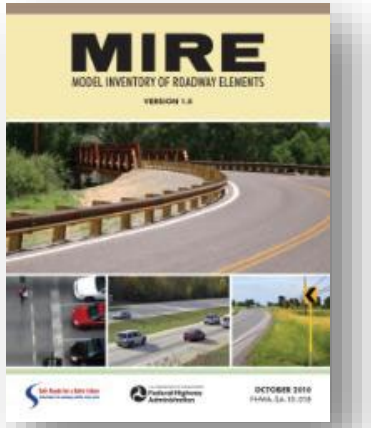
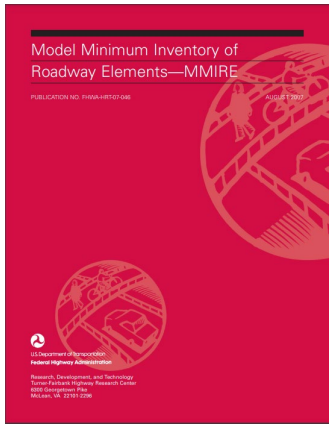
2007
MMIRE

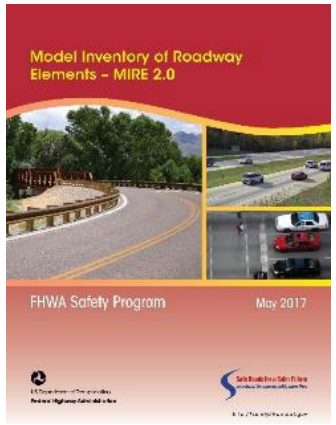


2017
MIRE 2.0

September 2026



2010
MIRE 1.0



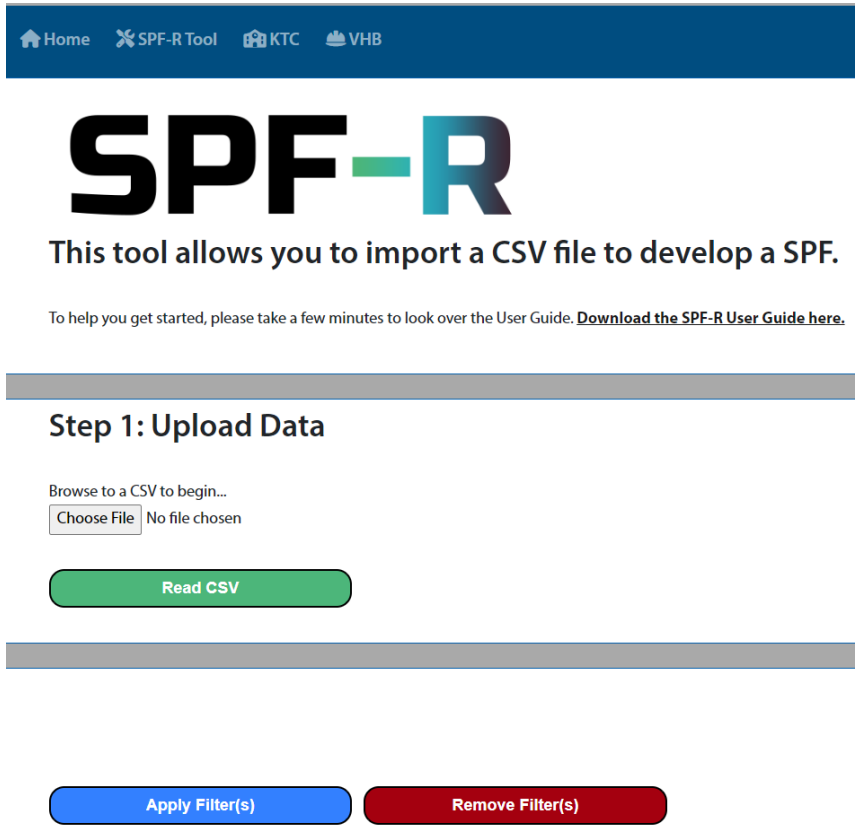
2023-2024
MIRE 2.1

Source: FHWA

SPF-R Online

Making Performance Function Development Easier and More Accessible

- Read about the updated tool in the [Winter 2023 issue of Safety Compass]
- SPF-R online is still free and open source, and in this current form is more accessible than before. It may be accessed by visiting https://spfr.uky.edu.

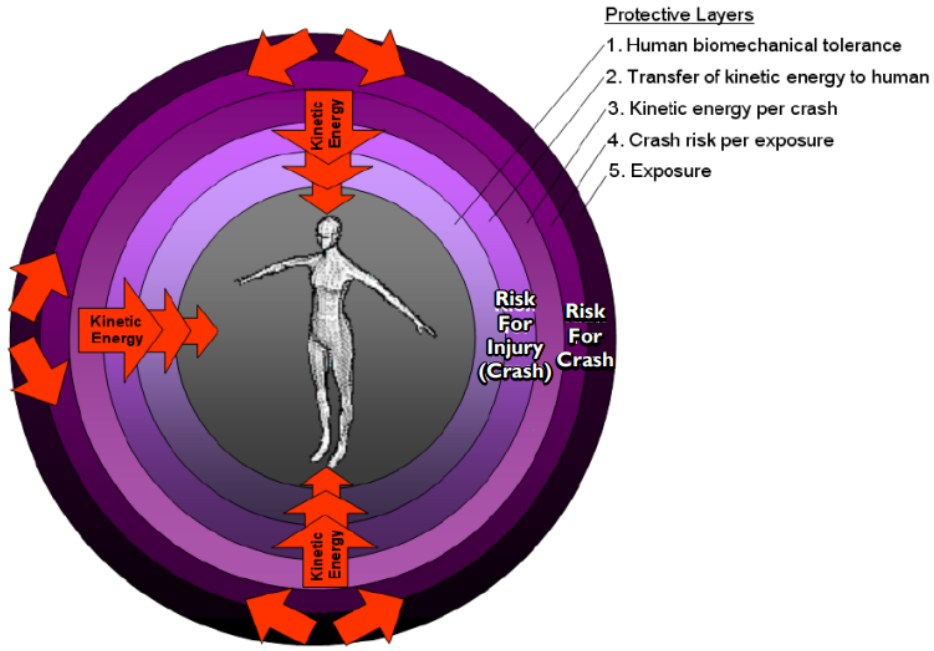


SPF-R web interface. (Source: KTC)

Safe System-based Framework for Intersections

TRB 2023 MYM

- Safe System Methodology for Intersections Tech Brief
- Safe System Methodology for Intersections Final Report



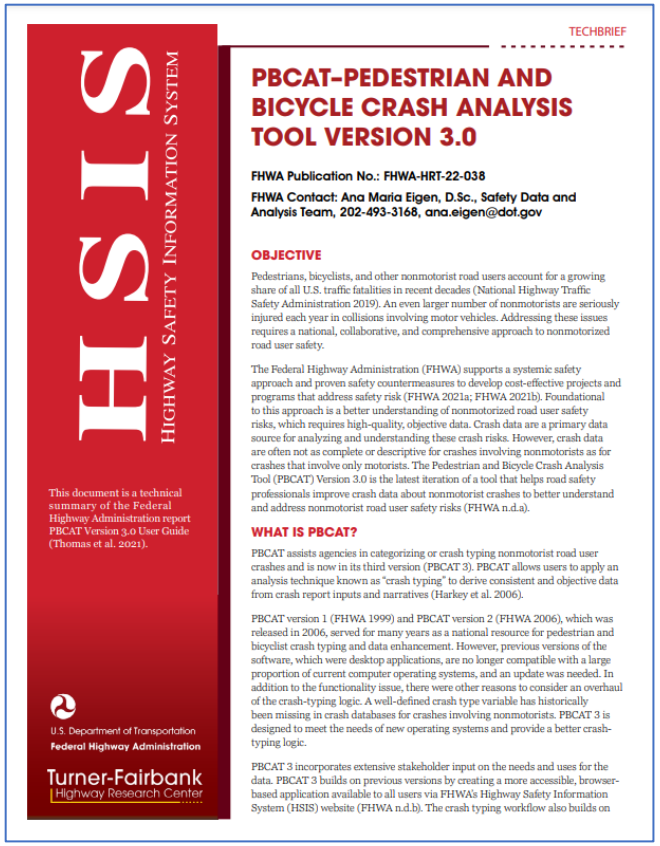
© Corben et al. 2010

Figure 1. Graphic. The five layers of protection in the KEMM.

Pedestrian and Bicycle Crash Analysis Tool

TRB 2023 MYM

Version 3 now available!



HSIS
HIGHWAY SAFETY INFORMATION SYSTEM

This document is a technical summary of the Federal Highway Administration report PBCAT Version 3.0 User Guide (Thomas et al. 2021).

U.S. Department of Transportation
Federal Highway Administration

Turner-Fairbank Highway Research Center

TECHBRIEF

PBCAT–PEDESTRIAN AND BICYCLE CRASH ANALYSIS TOOL VERSION 3.0

FHWA Publication No.: FHWA-HRT-22-038

FHWA Contact: Ana Maria Eigen, D.Sc., Safety Data and Analysis Team, 202-493-3168, ana.eigen@dot.gov

OBJECTIVE

Pedestrians, bicyclists, and other nonmotorist road users account for a growing share of all U.S. traffic fatalities in recent decades (National Highway Traffic Safety Administration 2019). An even larger number of nonmotorists are seriously injured each year in collisions involving motor vehicles. Addressing these issues requires a national, collaborative, and comprehensive approach to nonmotorized road user safety.

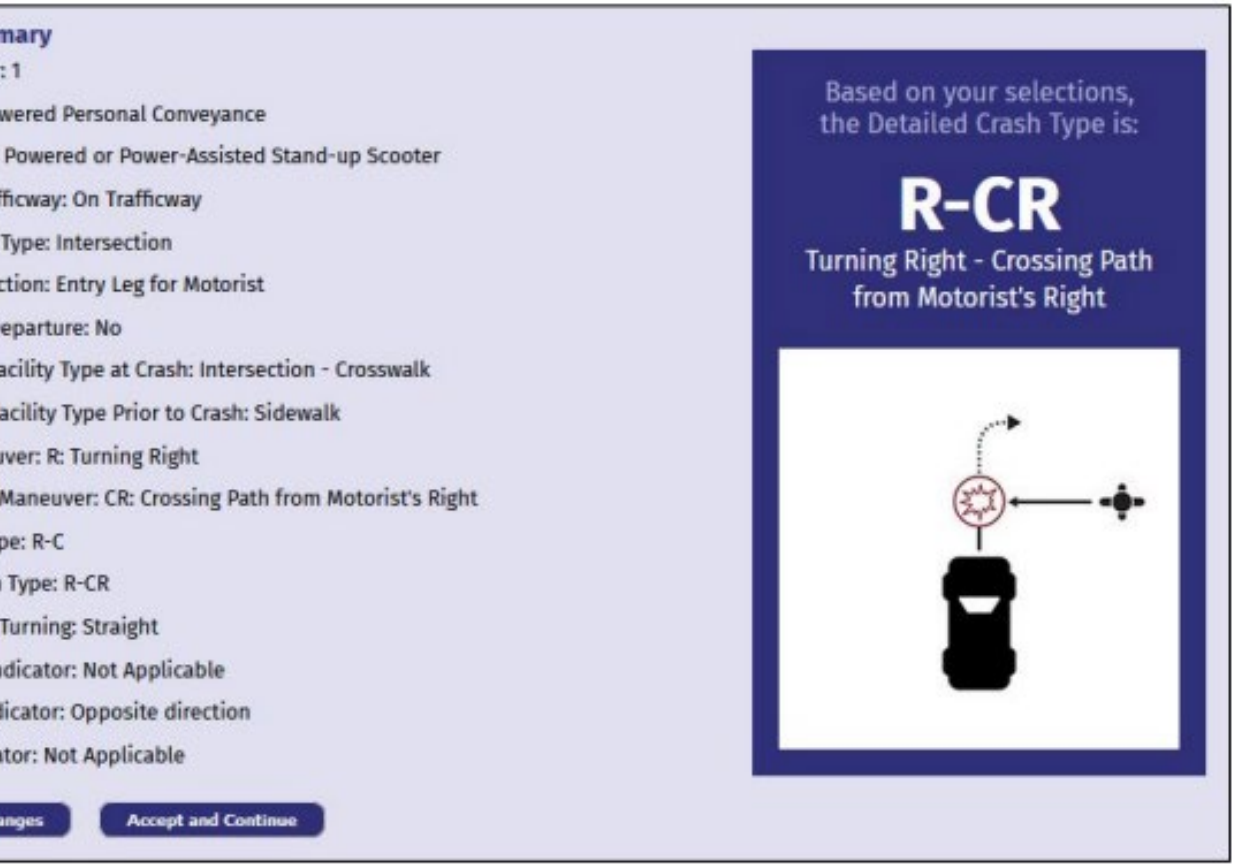
The Federal Highway Administration (FHWA) supports a systemic safety approach and proven safety countermeasures to develop cost-effective projects and programs that address safety risk (FHWA 2021a; FHWA 2021b). Foundational to this approach is a better understanding of nonmotorized road user safety risks, which requires high-quality, objective data. Crash data are a primary data source for analyzing and understanding these crash risks. However, crash data are often not as complete or descriptive for crashes involving nonmotorists as for crashes that involve only motorists. The Pedestrian and Bicycle Crash Analysis Tool (PBCAT) Version 3.0 is the latest iteration of a tool that helps road safety professionals improve crash data about nonmotorist crashes to better understand and address nonmotorist road user safety risks (FHWA n.d.a).

WHAT IS PBCAT?

PBCAT assists agencies in categorizing or crash typing nonmotorist road user crashes and is now in its third version (PBCAT 3). PBCAT allows users to apply an analysis technique known as "crash typing" to derive consistent and objective data from crash report inputs and narratives (Harkey et al. 2006).

PBCAT version 1 (FHWA 1999) and PBCAT version 2 (FHWA 2006), which was released in 2006, served for many years as a national resource for pedestrian and bicyclist crash typing and data enhancement. However, previous versions of the software, which were desktop applications, are no longer compatible with a large proportion of current computer operating systems, and an update was needed. In addition to the functionality issue, there were other reasons to consider an overhaul of the crash-typing logic. A well-defined crash type variable has historically been missing in crash databases for crashes involving nonmotorists. PBCAT 3 is designed to meet the needs of new operating systems and provide a better crash-typing logic.

PBCAT 3 incorporates extensive stakeholder input on the needs and uses for the data. PBCAT 3 builds on previous versions by creating a more accessible, browser-based application available to all users via FHWA's Highway Safety Information System (HSIS) website (FHWA n.d.b). The crash typing workflow also builds on



FHWA-HRT-22-038
Source: FHWA

[PBCAT Pedestrian and Bicycle Crash Analysis Tool Version 3.0 User Guide (dot.gov)](),

https://www.pbcat3.org/

my street

An evidence-based tool that helps the decision-maker "see" safety issues from the perspective of the pedestrian.

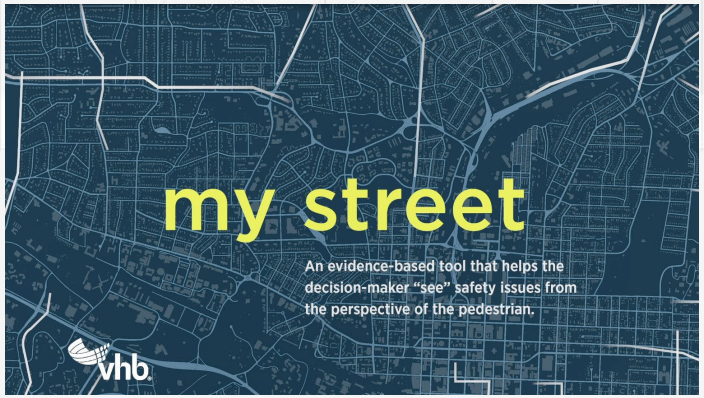
Results

Based on the data you provided, My Street created profiles of the roadway facility types where pedestrian crashes occurred most often. My Street identifies all corridors and segments that matched each of the facility type profiles where crash frequency and crash risk is highest. Explore this map and table to review sites in more detail.

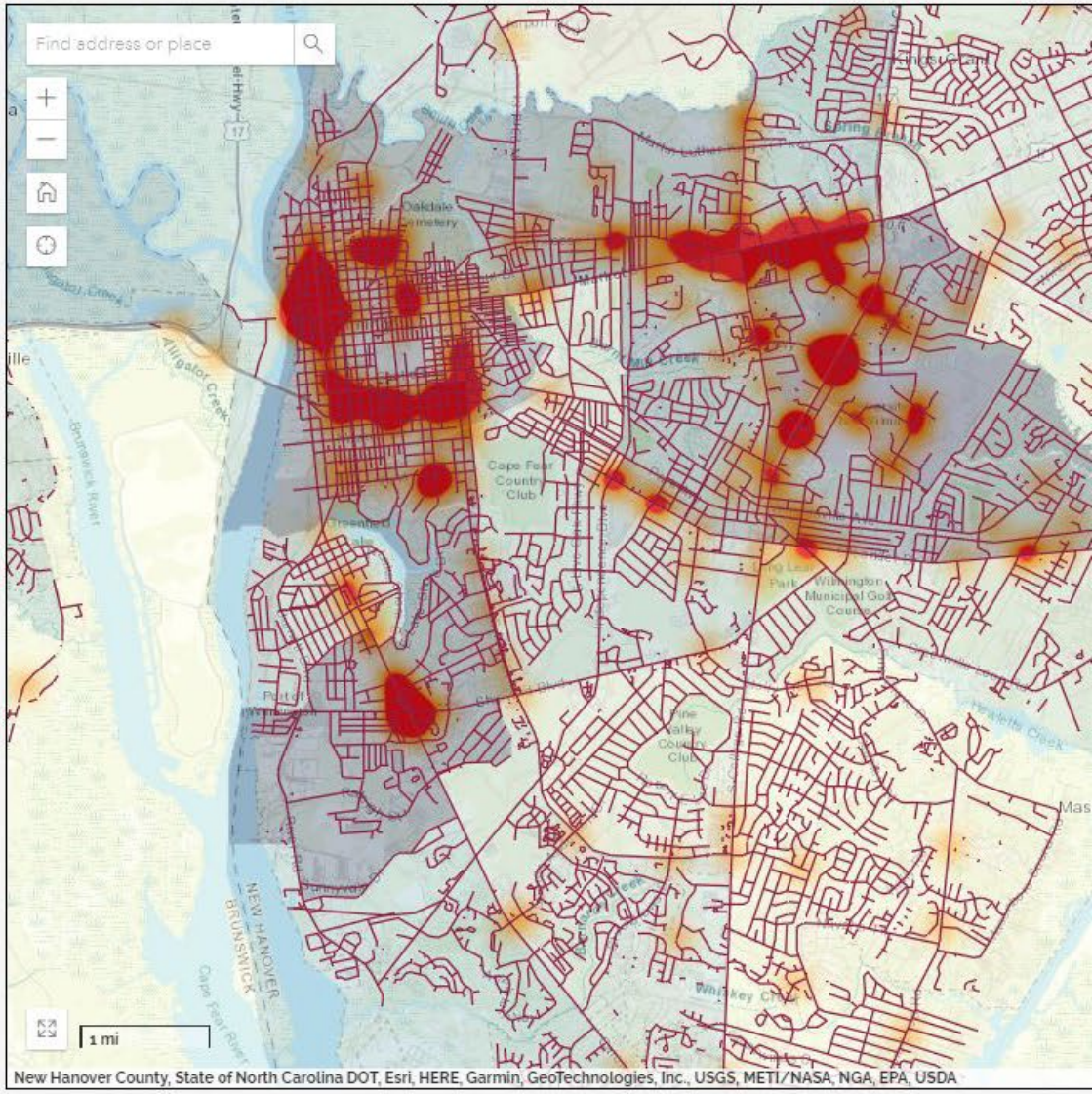
Systemic Analysis Results: Facility Types

Help

	Speed Limit	AADT	Lanes	Fatal	Serious Injuries	Other	Crash Count	Weighted Score
+	Over 40 mph	Over 15000	4+	16	0	95	111	15282.04
+	Under 40 mph	Under 9000	2	5	0	100	105	4845.95
+	Under 40 mph	Over 15000	4+	3	0	42	45	2889.57
+	Under 40 mph	9000-15000	2	2	0	12	14	1910.38
+	Over 40 mph	9000-15000	2	2	0	12	14	1910.38



Source: FHWA



Understand Unique Needs of Vulnerable Pedestrians

Source: FHWA

https://mystreetpedsafety.org

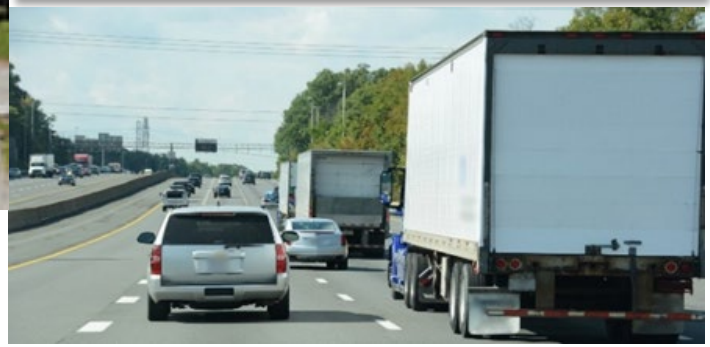
SHRP2 Naturalistic Driving Study PF (7 States) – Charles Fay

- Verification and Calibration of Microscopic Traffic Simulation Using Driver Behavior and Car-Following Metrics for Freeway Segments
- Incorporating the Impacts of Driver Distraction into Highway Design and Traffic Engineering
- Freeway Guide Sign Performance at Complex Interchanges: Reducing Information Overload
- Investigating How Multimodal Environments Affect Multitasking Driving Behaviors
- Validation of Performance-Based Design
- Developing Speed Crash Modification Factors (CMF) Using SHRP 2 RID Data

https://www.pooledfund.org/Details/Study/613

Human Factors Research Related to Vehicle Automation Safety – Brian Phillips

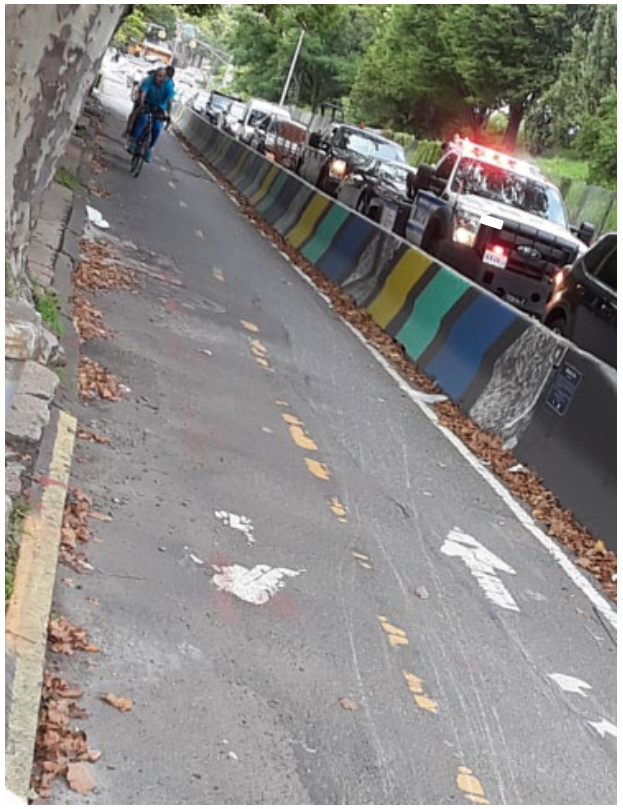
- Transportation Systems Management and Operations (TSMO).
- Adaptation to automation.
- Infrastructure.
- Truck platooning.
- Vulnerable road users.



All photos source: FHWA.

Vulnerable Road User Research Studies – Brian Phillips

Separated Bike Lane (SBL)



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Right Turn Radius

Original Photo: © 2019 Google. Modifications: FHWA.

Warning Sign with LED

Source: Modifications by FHWA.[1]

[1]FHWA. 2009. *Embedded LEDs in Signs.* Report No. FHWA-SA-09-006. Washington, DC: FHWA.

Evaluation of Low-Cost Safety Improvements PFS (41 states) – Carol Tan

Coming Soon!

- HRT-22-115: ***Development of Crash Modification Factors for Wrong-Way-Driving Countermeasures***
- HRT-22-112: ***Techbrief: Development of Crash Modification Factors for Wrong-Way-Driving Treatments***
- HRT-22-XXX: ***Compendium of Wrong-Way-Driving Treatments***
- HRT-23-020: ***Development of Crash Modification Factors for Bicycle Treatments at Intersections***
- HRT-23-031: ***Techbrief: Development of Crash Modification Factors for Bicycle Treatments at Intersections***

https://highways.dot.gov/research/safety/evaluations-low-cost-safety-improvements-pooled-fund-study/evaluations-low-cost-safety-improvements-pooled-fund-study-elcsi%E2%80%93pfs

Intersections – Wei Zhang

Coming Soon!

- HRT-22-XXX: ***Development of Crash Modification Factors for Mini Roundabouts***
- HRT-22-109: ***Techbrief: Development of Crash Modification Factors for Mini Roundabouts***

Expanding safety data – Yusuf Mohamedshah

TRB 2023 MYM

Transportation Research Informatics Platform (TRIP) Maturity and Use Cases:

1) Measuring and Monitoring Operational Performance of TSMO Strategies
2) Identifying Secondary Crash Occurrence and Contributing Factors.
3) Non-Recurring Congestion Monitoring and Analysis.
4) Pedestrian Activity and Safety

Development of two Realistic Artificial Datasets (RAD)

1. Multidisciplinary Initiative on Methods to Integrate and Create realistic artificial dataset (MIMIC)
   - MIMIC—Multidisciplinary Initiative on Methods to Integrate and Create Realistic Artificial Data
2. Development and Application of a Disaggregate Realistic Artificial Data Generator for Computationally Testing Safety Analysis Methods (DREDGE)