IHSDM 2018 –
New Enhancements
Support DDSA

EDC / DDSA Webinar
November 1, 2018
Agenda

- EDC / DDSA Overview
- IHSDM Overview
- What’s New in IHSDM 2018?
- IHSDM 2018 Demonstration
- Potential Future Enhancements
- IHSDM User Group
- IHSDM Training Opportunities
- Q & A
Data–Driven Safety Analysis

Using evidence-based tools to evaluate the current and future safety performance of roadways, allowing agencies to target investments with more confidence and reduce severe crashes on their system.
Data-Driven Safety Analysis

• These tools help agencies quantify the safety impacts of transportation decisions, similar to the way agencies quantify:
  – traffic growth
  – environmental impacts
  – traffic operations
  – pavement life
  – construction costs
DDSA can be applied throughout the Project Development Process


Planning  Alternatives Analysis  Design  Construction, Operations & Maintenance
• DDSA tools can predict the number and severity of crashes for each project alternative, allowing safety performance to be considered along with other project criteria.
Integrating Safety into NEPA Analysis

Safety Planning Process (Pre-NEPA)

- Scoping
  - Solicit input from safety stakeholders

- Purpose-and-Need
  - Include safety; link to safety planning processes

- Alternatives Analysis
  - Evaluate safety performance

- Affected Environment
  - Define the context

- Environmental Consequences
  - Evaluate safety impacts

- Mitigation
  - Propose mitigation to address safety impacts

Policy/Stakeholder Involvement

- Include safety stakeholders
- Provide safety analysis to the public

Source: FHWA

http://safety.fhwa.dot.gov/tsp/fhwasa1136/fhwasa1136.pdf
DDSA in the Design Process

- DDSA can be used to determine *optimal* design criteria, considering both safety and cost.
- DDSA helps justify flexibility in design
  - design exceptions
  - performance-based practical design
Performance-Based Practical Design

- An approach to decision-making that encourages *engineered solutions* rather than reliance on maximum values or limits found in design specifications

- Characteristics
  - grounded in performance management
  - exercises engineering judgment to address purpose and need
  - uses appropriate performance–analysis tools
  - considers both short- and long-term project and system goals
Version 14.0.0 (Sept 2018)
IHSDM Development Team

FHWA Geometric Design Lab (GDL) Manager
• Abdul Zineddin

GDL Staff (Genex Systems)
• Mike Dimaiuta
• Mohamad Banihashemi

IHSDM Software Developer
• Peter Holm (Peraton)

FHWA Resource Center
• Dave Petrucci
  FHWA Office of Safety
• Jerry Roche
IHSDM Evaluation Modules

- Crash Prediction Module
- Diagnostic Tools
  - Traffic Analysis Module
  - Intersection Review Module
  - Design Consistency Module
  - Driver/Vehicle Module
- Policy Review Module
DDSA using IHSDM

CPM output (crash frequencies / rates and severities) are used in DDSA
• As a tool to identify facilities with the greatest potential for safety improvement

• As a tool to assess design options:
  – Evaluate alternatives
  – Evaluate proposed design exceptions
  – Evaluate and refine preliminary geometry
IHSDM Applications that Support DDSA

- As an integral part of the Road Safety Audit (RSA) process
- As a tool to assess the safety “benefit” when conducting a B/C analysis (predict crashes before and after reconstructing or improving a facility)
## What’s New in v14.0.0?

<table>
<thead>
<tr>
<th>Release</th>
<th>Enhancement</th>
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<tbody>
<tr>
<td>2018 (14.0.0)</td>
<td>CPM Evaluation Report enhancements</td>
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<td></td>
<td>Site Set Export/Import</td>
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<tr>
<td>2017 Update</td>
<td>Economic Analyses Tool expanded to all facility types covered in HSM Part C</td>
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<td>(13.1.0)</td>
<td>Data entry options expanded to include input by mileposts (“location-based”)</td>
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</table>
• For Empirical–Bayes (E–B) analyses:
  – “Crash Frequencies by highway segment/intersection” now includes Expected, Predicted, and (Expected – Predicted)
    • for Total, FI, and PDO crashes
• Tables added for:
  – Predicted Crash Frequencies by Year
  – Expected Crash Frequencies by Year \textit{(for EB)}
  – Comparing Predicted and Expected Crashes for the Evaluation Period \textit{(for EB)}
"CSV Export Site Data" and "CSV Import Site Data" options were added for Site Sets.

Data from a CSV file created via the new CSV Export Site Data option can be imported into Calibration Data via Import Site Data (in the Admintool) – and vice versa.
IHSDM Economic Analyses Tool

Purpose

- To allow IHSDM users to do economic analyses within IHSDM, using Crash Prediction Module (CPM) evaluation results (i.e., crash frequencies and severities)
The EA Tool now applies to all facility types currently covered by the CPM:

- Rural 2–Lane Highways
- Rural Multilane Highways
- Urban/Suburban Arterials (including arterials with 5 or fewer lanes, 6+ lanes and 1–way arterials)
- Freeway Segments and interchange components (ramps, C–D roads, and ramp terminals)
“Location-Based” Data Entry & Reporting Options

- Station/Location Notation is set through Edit > Preferences
- The setting is “global” (i.e., not Project / Highway / Evaluation–specific)
- Changing the Station/Location Notation instantaneously changes all displays in all Projects, including:
  - Data entry (e.g., Highway Editor)
  - Output / reporting (e.g., Evaluation Reports)
- The Station/Location Notation display does not change the underlying data
Edit > Preferences > Reporting/Data Display Tab

- Now includes options for Mileposts:
  - MP/KP: X.ZZ
  - Mi/Km: X.ZZZZZZZ
• CPM Evaluation Report Enhancements
• Mileposts: Data Entry & Output/Reporting
• Economic Analyses (EA) Tool
• Site Set Export/Import
Potential Future Enhancements
(2018 Update & 2019 Release)

• CPM:
  • Begin to implement HSM2 predictive methods for Roundabouts (NCHRP 17–70)
  • Capability to add user-defined CMFs (external to HSM Part C) to CPM evaluation
  • Enhance reporting capabilities for Site Sets
• Application Programming Interface (API) development
IHSDM User Group
Structure

• IHSDM User Group:
  – Big group (hundreds…)
  – IHSDM end-users or decision-makers who are “champions” of IHSDM

• IHSDM Steering Committee:
  – Small group
  – Greatest opportunity (and responsibility) to provide direct input to FHWA
IHSDM User Group

Purpose

• Foster communication between IHSDM users, by providing a forum for users to share their experiences with the software.

• Provide FHWA with a formal mechanism for obtaining input from IHSDM users. Input will help FHWA establish priorities for future IHSDM software development.

• Provide a forum for discussions/presentations on specific IHSDM–related topics.
IHSDM User Group

- Established summer 2018
- Kick–off web meeting held August 15
- Next meeting to be held this fall
- Sharepoint Site under development
- IHSDM Steering Committee formed
IHSDM User Group
Sharepoint Site

IHSDM User Group ➤ Team Discussion ➤ Subject

Use the Team Discussion list to hold newsgroup-style discussions on topics relevant to your team.

- Applications and Case Studies
- Crash Prediction Module (CPM)
- Data
- Documentation/Help/Tutorial
- Economic Analyses Tool
- IHSDM User Group meetings
- Institutionalization of IHSDM/HSM in Agencies
- Integration of IHSDM with Other Tools
- Other IHSDM Modules (non-CPM)
- Output/Reporting
- System Administration Tool (AdminTool)
- Training
- Use of IHSDM in Universities

Add new discussion
• Download: [http://www.ihsdm.org](http://www.ihsdm.org)

• Technical support:
  – [IHSDM.Support@dot.gov](mailto:IHSDM.Support@dot.gov)
  – (202)-493-3407
IHSDM Training

Through FHWA Resource Center (via EDC–4 or NHI) – contact Dave Petrucci at david.Petrucci@dot.gov or 202–823–2260:

- Visit [NHI](#) or [EDC](#)
- “IHSDM“ (2–day on–site)
- “Safety Analysis of Freeways and Interchanges” (2–day on–site)
For more information on DDSA…

- Fact Sheets and Case Studies
- Infographics
- Videos
- Webinars
- Informational Guides
- Training Workshops
- Technical Assistance