Roadway Inventory Data for EMS Response – the MIRE Development

Jack Stickel

Alaska Department of Transportation & Public Facilities
Safety Data – It’s More Than Just Crash Data

Good inventory safety data is the key to sound decisions on the design and operations of roadways

- Roadway characteristics
- Operations (volumes, classifications, WIM, turning movements)
- Roadside features
- Driver history and exposure (age)
- Agency assets
Minimum Inventory of Roadway Elements - MIRE

“A listing of roadway and traffic inventory elements that are critical for use in current and future”:

- Local and state safety programs
- Safety tools
- National safety and inventory systems
- Safety research and evaluation
MIRE Inventory Safety Data

Involving

- Highway Safety Improvement Programs
- Safe community programs
- Emergency medical response analysis (golden hour)
- Injury prevention programs (seat belts, pedestrian, bicycle)
- Trauma response (including GIS)
- Epidemiology
Minimum Inventory of Roadway Elements - MIRE

**Program Offices**
- FHWA Office of Safety Research and Development
- FHWA Office of Safety

**Project Team**
- HSRC – UNC Highway Safety Research Center
- VHB Consultants (BMI-SG)
MIRE Background

- Scanning Trip – AASHTO, FHWA, NCHRP safety scan to Netherlands, Germany, Australia (2003)


  - Build upon the recommendations from the international safety scan
  - Expand the strategies for improving safety data and information systems
  - Provide specific action items to implement these strategies
Whitepaper Strategy Areas

- Increase support for both safety programs and safety information systems (the data) from top-level administrators in federal, state, and local transportation agencies.

- Improve safety data by defining “good inventory data” and institutionalizing continual improvement towards established performance measures.

- Improve safety data by making it easier to collect, store, and use.

- Improve safety data by increasing the use of critical safety analysis tools which themselves require good data.

- Improve and protect safety data by storage and linkage with critical non-safety data.
Strategy 2 Recommendations

*Improve safety data by defining good inventory data and institutionalizing continual improvement toward established performance measures*

- Develop definitions of good safety data
- Develop performance measures to capture the current status of these elements in an agency’s safety database.
- Increase the emphasis on safety inventory data in FHWA and NHTSA traffic records assessments
- Insure that good data are incorporated into efforts related to developing XML schemes.
MIRE Development - Review

- Inventory elements in existing highway inventory systems and potential gaps (curvature, intersections)

- Model Minimum Uniform Crash Criteria (MMUCC) – de-facto standard for crash data variables used by states and local jurisdictions when improving their crash data systems

- Current and proposed inventory elements in other national databases that provide good current work, but inadequate for future needs
  - HPMS – Highway Performance Monitoring System
  - TSIMS – Transportation Safety Information Management System
MIRE Development - Review

• Inventory elements needed in existing and proposed tools
  – IHDSM – Interactive Highway Design Safety Model
  – AASHTO’s Data and Analysis Guide
  – Highway Safety Manual
  – SafetyAnalyst –
  – PBCAT – Pedestrian and Bicycle Crash Analysis Tool

• Other critical variables that may be collectable with future technology such as pedestrian and bicycle exposure data
MIRE Development: SAFETEA-LU

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users

- Section 2006(e) State Traffic Information System Improvements

- USDOT Secretary will define **model data elements** for safety analysis and safety grants

- Great fit with SAFETEA-LU to meet the **model data elements** in the new safety information system grants
MIRE Development

- MIRE Workshop @ 32\textsuperscript{nd} International Traffic Records Forum (3 Aug) - engage safety and inventory community
  - DOT data collection managers
  - State and local data users
  - Roadway safety researchers

- Draft recommendation based on workshop feedback

- Final report of MIRE data elements – Nov 2006
MIRE Development – MIRE Matrix

- Straw man data categories and data elements

- Critical safety data inventory elements
  - Needed by State and local agencies to conduct internal analysis
  - Required by existing safety analysis tools and resources
  - Envisioned to be needed by future tools and analyses

- Four key sources for MIRE matrix elements

- MIRE data elements prioritized (1st, 2nd) with current state data collection status
MIRE Development – MIRE Matrix

• Proposed data elements based on:
  – HPMS universe and sample sections
  – IHSDM - *Interactive Highway Safety Design Module (FHWA)*
  – Safety Analyst – FHWA safety management tools
  – TSIMS – *Traffic Safety Information Management System (AASHTO)*
MIRE Development – MIRE Matrix

• Also considered:
  – *Highway Safety Information System (FHWA)*
  – Roadway research efforts
  – Highway Safety Manual
  – Non-traditional safety areas: roundabouts, pedestrian, & bicycle
MIRE Matrix - Data Categories

- Location/linkage variables
- Roadway classification
- Segment – cross section surface descriptors
- Lane descriptors
- Shoulder descriptors
- Lane descriptors
- Median descriptors
- Roadside descriptors
MIRE Matrix - Data Categories

- Segment alignment
- Segment traffic operations control
- At grade intersection descriptors (general)
- At grade intersection descriptors (each approach)
- Interchange and ramp descriptors
- Other junction descriptors
- Traffic data
MIRE Matrix - Lane Descriptor Data Elements

- Number of lanes
- Average lane width
- Climbing/passing lane
- Left/right lane turn lane
- Marked bicycle lanes
- TWLTL (two-way left turn lane) presence
- Number of peak hour lanes
MIRE Matrix - Traffic Data Elements

- Average annual daily traffic (current & future)
- Hourly traffic volumes
- Percentage truck
- High occupancy vehicle (HOV) lanes
- Pedestrian count/exposure
- Bicycle count/exposure
- Directional factor
- Percent trucks (average & peak)
MIRE Development
MIRE Workshop Objectives

• Get feedback on adequacy of the proposed MIRE and priority of data elements

• Solicit suggestions for:
  – Additional / fewer data elements
  – Ease of collecting data elements
  – Changes in methodology that may be required to collect data

• Determine how best to proceed toward developing a draft MIRE implementation plan
MIRE Development
MIRE Workshop Results

• Consensus that MIRE will follow the MMUCC development process

• Data dictionary/codes to be developed beyond the current FHWA MIRE contract

• Changes to both MIRE data categories and data elements within the categories

• FHWA Pooled Fund – Digital Highway Measurement System potentially can be an integral part of an agencies strategic safety program that includes MIRE
Conclusion

- Anticipated that MIRE will become a companion to MMUCC (Minimum Model Uniform Crash Criteria)

- Voluntary, but envision MIRE will become a de-facto standard as well for states and local jurisdictions in improving crash data systems

- Adopted model elements will be used by states applying for SAFETEA-LU grants to certify they have adopted SAFETEA-LU model data elements or are working toward adopting them

- MIRE data elements could be collected through HPMS – HPMS Reassessment may define these synergies
Interested Party

Jack Stickel

(907) 465-6998

jack_stickel@dot.state.ak.us
Contacts

Carol Tan
FHWA Safety Research & Analysis
(202) 493-3315
Carol.Tan@fhwa.dot.gov

Robert Pollack
FHWA Office of Safety
(202) 366-5019
Robert.Pollack@fhwa.dot.gov