Network-level Winter Weather Safety Assessment

Database Development

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Objectives

- Investigate state of the practice

- Conduct network level assessment of winter weather-related crashes

- Develop work plan
Develop Analysis Network

- Establish one-mile segmentation for rural, state-maintained roadways
- Classify segments
  - Freeway
  - Expressway
  - Two-lane
Methodology

Identify & Integrate Crashes

- Extract appropriate crashes for winters of 1995/6 to 2008/9 (~186K)

- Classify crashes as
  - Winter weather-related
  - Not winter weather-related

- Assign crashes to roadway network
Methodology

Compute Crash-based Metrics

- Density
- Proportion
- Injury Severity
- Sample Composite Ranking
  - 1/3 density, 1/3 proportion, 1/3 severity

- Analysis Periods
  - Winters 1995/6 to 2008/9 (14 winters)
  - Winters 2001/2 to 2008/9 (8 winters)
Categorize Metrics

- Categories
  - Lowest 40% of system mileage (1)
  - Next 25% of system mileage (2)
  - Next 20% of system mileage (3)
  - Next 10% of system mileage (4)
  - Highest 5% of system mileage (5)
Presentation

- 24 maps
  - 4 metrics
  - 2 analysis periods
  - 3 road types

- Formats
  - GIS-based hard copy & digital maps
  - Keyhole Markup Language (KML) Maps
    - Google Maps, Google Earth
Google Maps: Freeways

www.cte.iastate.edu/zach/Freeway_Density_1995to2009_v3.kmz

Google Maps

Iowa State University
Institute for Transportation
Google Earth: Freeways

Legend - Severity

Winter Weather Crashes

- 0 - 1 (42.37%)
- 2 - 14 (23.34%)
- 15 - 104 (19.36%)
- 105 - 214 (9.85%)
- >214 (5.09%)
Google Earth: Expressways
Google Earth: Two-lane
Site Specific Analyses

• In-depth crash analysis
• Data integration
  – Weather
  – Roadway, roadside characteristics
  – Iowa DOT derived indices – speed, salt, labor
  – Field staff experience, actions, strategies
• Mitigation strategy evaluation
Winter Weather-related Crashes

- 32 crashes (1/01-4/09)
- 80% Westbound
- 60% Dark Conditions

Length: 0.8 miles
AADT: 35,000
Future Efforts

Site Screening & Investigation

• Comprehensive, systematic

• Based on computed, crash-based metrics

• Site review, mitigation strategy evaluation
Questions

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