Statewide Network Screening for Safety Improvements

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Outline

- Define Safety
- Safety Assessment
- Crash Rates
- Strategic Highway Safety Plan
- New Approaches to Assessing Safety
- Project Purpose and Needs
Definition of Safety

Everything we do is safety

Program specific

Project specific

Motor Vehicle Crashes
  Prevention
  Reduction
Definition of Safety

预防

识别与事故相关的项目
- 曲线
- 交叉口
- 道路段

风险管理

事故 = 不安全

无事故 = 安全
Definition of Safety

- Preventive
  - Identify items that are correlated to crashes
    - Curves
    - Intersections
    - Segments of roads
- Risk Management
  - Crashes = unsafe
  - No crashes = safe
Definition of Safety

Reduction

Apply treatments to locations with a known crash issue, focusing on incremental improvements to reduce crashes or risks associated with crashes.

- Bias to high severity crashes and crash types
  - Fatal and serious injury
  - Angle Crashes
  - Run of Road, Head On Crashes

- Secondary bias to large number of crashes
Safety Assessment

- Traffic Office “Green Sheets”
  - Crash Rates for comparable
    - Intersections
    - Segments of road
    - Statewide and District Averages

- Crash rates have shortcomings
  - Volume is a predictor of crashes (Highway Safety Manual)
  - Crash rates force a linear relationship
Linear Relationship

Number of Minnesotans Employed and Annual VMT
Linear Relationship?

![Graph showing Minnesota VMT and Traffic Fatalities](image)
What Crash Rates Don’t Tell You

What is the problem?
- Crash rate at an intersection exceeds average

What are we trying to fix?
- Angle Crashes?
- Rear End Crashes?
- Pedestrian Crashes?

Determine the safety need
Safety Assessment

- Top 200 Segments/Top 150 Intersections
- Ranked by crash costs
  - Per intersection
  - Per mile
- Costs assigned by severity of crashes
  - Fatal crash - $830,000  ($7,100,000)
  - Severe Injury - $415,000
  - Moderate Injury - $137,000
  - Possible Injury - $91,000
  - Property Damage Only - $12,000
AASHTO developed 22 emphasis areas for traffic crashes:

- Drivers
- Special users (Bike, Pedestrians, …)
- Vehicles (Trucks, motorcycles, passenger cars)
- Highway (intersections, lane departure, work zones, …)
- Emergency Medical Services
- System Management
4 E’s to Safety

- Engineering
- Education
- Enforcement
- Emergency Services
New Assessments

- Examine crash densities for emphasis areas
  - Lane Departure crashes
  - Intersection crashes
  - Alcohol related crashes
  - Seat Belt crashes
  - ... density emphasis areas
New Assessments

Examine crash distribution
- Crashes will happen, is it what we expect?

Bench mark against a normal crash distribution
- Overrepresentation of severe crash types
- Example: Traffic signals
  - Expect a reduction in right angle crashes
  - Expect an increase in rear end crashes
Methodology Application

- Interregional Corridors
  - 4 measures
    - Crash Density
    - Severe Crash Density
    - Severe Crash Type Density
      - Head On
      - Run Off Road
      - Angle Crashes
    - Driver Behavior Density
      - Alcohol related crashes
      - Unbelted Crashes
      - Speed related crashes
Purpose and Need?

- Crash rate does not identify safety deficiencies
- New assessments can provide objective basis for “safety”
- Stand alone safety needs are not usually substantial
  - 2008 highest crash cost location - $2 million annual cost
  - 60% costs are PDO crashes, 40% of costs are injury crashes
- Correlation between capacity and safety
Summary

- Crash Rates are part of the picture
- Need to examine where safety breakdown is occurring
- Things can be unsafe with a low crash rate
- Things can be safe with a high crash rate
- Leverage data to help make your case for safety improvements