

Data-Driven Safety Training

Rural Multilane Safety Analysis

Part 1 RML HSM

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Outline

1 Introduction to RML HSM

2 Input data

3 Centertown US-50 sample exercise

4 Centertown US-50 sample solution

Rural Multilane Highways Scope

- HSM includes both divided and undivided
- Multilane undivided
 - uncommon in Missouri
 - not calibrated
 - not covered in this workshop
- Workshop covers only 4 lane rural multilane divided
 - RML – rural multilane

Safety Prediction Structure

- crashes (N) = SPF x CMFs x C
- SPF (Safety Performance Function) prediction based on level of exposure: traffic and segment length
- CMFs (Crash Modification Factors) based on other facility characteristics, e.g. lane width, shoulder width
- C (Calibration Factor) calibrates the national model to our Missouri conditions

Rural Multilane SPF

$$N = \exp(a + b \times \ln[AADT] + \ln[L])$$

- L = length of roadway segment (mi);
- $AADT$ = AADT volume of roadway segment (veh/day);
- a, b = regression coefficients
- This is the base model
 - tweak by using CMFs

Observed Number of Crashes

- Crash assignment to segment
 - based on geometric design, traffic control, operational characteristics
 - remove intersection-related crashes if present on segment
 - MoDOT physical intersection criterion – if crash occurred within 132 ft of intersection

Area Type

- Classification of areas depends on the roadway characteristics, surrounding population, and land use
- FHWA/HSM/MoDOT - urban areas as regions with population greater than 5,000 people
 - if fewer, then rural
 - metropolitan, urbanized, or suburban refer to urban subcategories, not used in HSM

Segment Length

- Total length of homogeneous segment
 - no significant change in travelway, cross-section geometry and speed limit
 - min 0.1 mi
- Has no intersections or contain interchange facilities

Left/Right Lane Width

- Left/right lane widths for each direction
- Average lane widths if lane widths differ in each direction



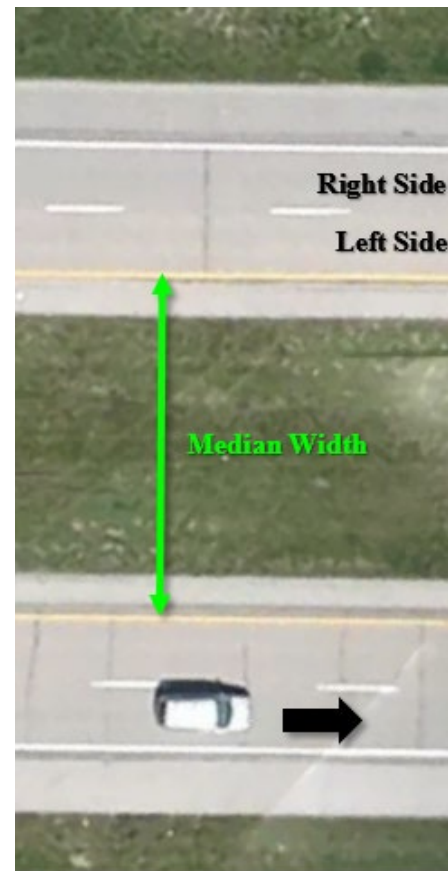
Left/Right Side Paved Shoulder Width

- Right – from outside travelway white striping to edge of shoulder
 - Left – from yellow striping to end of inside shoulder, unused
- Average lane widths if lane widths differ in each direction



Effective Median Width

- Measured between the inside edges of travelway in opposing direction of travel
 - inside shoulder and turning lanes are included, if present



Lighting and Automated Enforcement

- Lighting – yes/no presence of road lighting along the segment
- Automated speed enforcement – yes/no

Base Conditions for RML Segments

Description	Base Condition
Lane Width	12 ft
Right Paved Shoulder Width	8 ft
Median Width	30 ft
Lighting	None
Automated Speed Enforcement	None