Evaluation of Rural Freeway Work Zone Simulation Software

Li Zhang, Ph.D., P.E.

Jizhan Gou, Graduate Assistant

Mississippi State University

Xiang Fei, Ph.D.

Virginia Department of Transportation

Shiwei He, Ph. D.

Wangtu Xu

Beijing Jiantong University

Objectives

- Evaluation Simulation Software in MUTCD Terms
  - **CHAPTER 6C. TEMPORARY TRAFFIC CONTROL ELEMENTS**
  - **CHAPTER 6F. TEMPORARY TRAFFIC CONTROL ZONE DEVICES**
  - **CHAPTER 6G. TYPE OF TEMPORARY TRAFFIC CONTROL ZONE ACTIVITIES**
- Summary of MUTCD Terms
  - Work Zone Elements
  - Temporary Traffic Operations Models
  - Temporary Traffic Control Devices
  - Typical Applications

Approaches

- Conceptual
- User’s Manual Review
- Example Studies
- Result Comparison

Initial Findings: Conclusions

- Current software needs significant enhancement in order to model rural freeway with work zone

Work Zone Elements

- Elements
  - Advance warning area
  - Transition area
  - Activity area
  - Termination area
- No Software that Explicitly Models Those Components Founded

Temporary Traffic Operations Models (1)

- Diversion/Detour
  - Automatic (e.g. VISSIM, DYNASMART)
    - Driver User Equilibrium
    - User Specified: % of diversion
  - Workaround (e.g. CORSIM)
    - Turning % Based
  - Macro
    - Quickzone: Detour Capacity is Used

Temporary Traffic Operations Models (2)

- One-lane, Two Way
  - Workaround
    - Actuated Control Logic: CORSIM, VISSIM
  - Macro
    - Quickzone: Deterministic Queue
  - Other?
    - DYNASMART?

Temporary Traffic Control Devices

- 110 in Total by MUTCD
- Software models only a few of them
- Workaround:
  - Capacity/Speed/Driver Behavior Changes
  - Guidelines?

Typical Applications

- Work Outside of Shoulder
- Work on the Shoulder
- Work Within the Traveled Way of Two-Lane Highways
- Work Within the Traveled Way of Expressways and Freeways