OBSERVATIONAL STUDY AND INTERCEPT SURVEY APPROACH FOR MODELING PEDESTRIAN BEHAVIOR AT MIDBLOCK CROSSWALKS

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BACKGROUND

• Today’s urban transportation system involves complex interaction between various agents.
  • Motorists, Pedestrians, Bicyclists, Transit users
  • Challenge – Sharing the Right of Way Safely
  • 2010 NHTSA Pedestrian Safety Statistics:
    - 976 fatalities from failure to yield right of way
    - 34% of total ped. fatalities were age 55+
    - 70,000 injured, 20% age 14 and younger
  • Existing engineering analysis assumes full compliance from drivers in yielding for pedestrians at unsignalized crosswalks

METHODOLOGY

Objectives:

• Using statistical models:
  • Describe driver yielding behavior toward pedestrian(s)
  • Explain pedestrian(s) crossing decisions at midblock crosswalks

To address these objectives, observational studies and pedestrian intercept surveys are conducted at midblock locations with clearly marked crosswalks.

Candidate study sites characteristics:

• Raleigh (NC), Birmingham (AL), and Gainesville (FL)
• 6 On-campus and 4 Off-campus from each university
• Geometry: single- or multi-lane with/without turn lanes, single- or two-stage crossing
• Land use: education, public office, parking
• Peak hour activity for vehicles and pedestrians

Equipment used:

• Video camera and tripod
• Radar gun with tripod and display screen
• Laser speed gun

Model Development:

• Driver yielding behavior using logit model
• Critical gap analysis for pedestrians
• Pedestrian delay analysis

DATA COLLECTION

PEDESTRIAN INTERCEPT SURVEY

The observational study is supplemented with intercept surveys to enable analysis of pedestrian perception of vehicle, facility and driver characteristics. Researchers collect the information by conducting brief interviews of pedestrians that have completed their crossing at study locations.

Questions include:

• Frequency of crossing at that location,
• Eye contact with driver,
• Waiting time perception, and
• Aggressive driver perception.

Age, able-bodied (y/n), distraction, and crossing location were recorded by the interviewer after the survey was completed.

Pilot Study:

Pedestrian interviews were conducted at an on-campus and off-campus pilot data collection site in Alabama.

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IMPLICATIONS

The data gathered by the observational study and the intercept survey will feed into the development of comprehensive models for pedestrian-vehicle interaction at unsignalized crosswalks. The analytical models would be incorporated in algorithms ready to be implemented in microscopic traffic simulation tools to assure successful technology transfer.

PRELIMINARY FINDINGS

The pilot studies identified the following issues:

• Importance of clearly defining the variables so that the results from the three universities involved in the study can later be compared.
• Accurately measuring speed and distance of the approaching vehicle at the time the pedestrian steps into the crosswalk.
• Defining pedestrian behavior as assertive or passive
• Defining dynamic yielding when vehicle slows down and pedestrian crosses in front of moving vehicle.

Action: Questions and common misunderstandings were addressed in a data collection manual.

An issue that may be encountered for this project would be low pedestrian and/or vehicle volumes at the study sites.

Action: This will be addressed by supplementing staged crossings when the pedestrian activity is low and will be denoted on the data collection sheet.