



SPR RESEARCH PROGRAM SECOND-STAGE PROBLEM STATEMENT FY 2009-10

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I. PROBLEM NUMBER – IM-10-10

II. PROBLEM TITLE – Evaluation of Alternative Pedestrian Traffic Control Devices

III. RESEARCH PROBLEM STATEMENT

In 2007 there were 551 motor vehicle crashes in which 49 pedestrians were killed and 533 pedestrians were injured. The majority (314) of the pedestrian involved crashes occurred when pedestrians were crossing at an intersection or in a crosswalk and an additional 159 occurred while pedestrians were crossing the street, but not at an intersection. Of the drivers with errors, failure to yield to pedestrians was identified in 72% of the cases.

The Federal Highway Administration (FHWA) recently issued Interim Approval for Optional Use of Rectangular Rapid Flashing Beacons (RRFB) (IA-11) as a supplement to standard pedestrian crossing or school crossing signs at crosswalks at uncontrolled approaches. Evaluations performed in several Florida cities show compliance rates over 80 percent compared to rates in the 15 to 20 percent range for standard beacons. Florida's pedestrian law is a "yield" law whereas in Oregon drivers must stop for pedestrians so the results achieved here might differ. The City of Portland is planning to install RRFBs at a new mid-block marked crosswalk along 82nd Avenue, south of Francis Street.

Other pedestrian traffic control devices have been designed and some have been installed on an experimental basis in Oregon and elsewhere. One such device is the HAWK also referred to as a pedestrian hybrid signal in the proposed next edition of the federal Manual on Uniform Traffic Control Devices (MUTCD). The pedestrian hybrid signal implements a flashing yellow signal upon pedestrian activation which turns to a steady yellow after a few seconds and then turns to a steady red indication. The pedestrian is then given a standard walk symbol like all other signalized intersections to safely cross the roadway. Once the DON'T WALK symbol starts flashing the corresponding signal heads on the main roadway also start flashing red allowing vehicles to proceed after stopping if the pedestrian has cleared the area in front of the travel lane. Once the pedestrian phase has completed the signal rests in a dark mode for all vehicles and pedestrians until the next activation by a pedestrian. Proposed MUTCD amendments that are currently under review would allow jurisdictions to use of pedestrian hybrid signals, however the two installations in Portland vary from the proposed MUTCD guidelines.

The ODOT Traffic Operations Leadership Team (TOLT) and Oregon Traffic Control Devices Committee (OTCDC) are interested in evaluating the effectiveness of RRFB devices and other devices such as the pedestrian hybrid signal in improving motorist stop rates at several pedestrian crossings on both state highways and local streets.

IV. RESEARCH OBJECTIVES

- To review pedestrian motor vehicle crash information to identify locations where enhanced guidance could provide benefits to pedestrians.
- To evaluate the application of Rectangular Rapid Flashing Beacons (RRFBs), pedestrian hybrid signals, and more traditional warning beacons at selected locations in Oregon. Motorist response to various devices and accompanying signing will be evaluated as well as responses from pedestrians.
- To develop guidelines for the use of alternative traffic control devices designed to improve pedestrian crossing safety.

V. WORK TASKS AND DURATION

1. **Literature Review:** The literature review will focus on pedestrian crossing safety at non-signalized intersections and mid-block crossings. The literature review will include an in depth review of evaluations completed by various jurisdictions seeking interim FHWA approval on new devices in order to determine detailed results for various types of configurations of signing, signals, and pavement markings. Additionally emphasis will be given to identifying evaluations that may indicate driver response and reaction. An interim report will be prepared. **Estimated cost:** \$20,000

2. **Data Collection and Assessment:** The data collection effort will focus on in depth analysis of crash data and reports on pedestrian involved motor vehicle crashes to identify a subset of sites for further analysis and potential selection as a site for implementing and evaluating alternative pedestrian traffic control devices. Sites where recent enhancements have been made to pedestrian crossings or where improvements are planned will be included. **Estimated cost:** \$20,000

3. **Assess alternative pedestrian traffic control devices:** Select sites and pedestrian crossing enhancements to implement and evaluate. The research team will collect data on both pedestrian and driver response at each location. The use of a driver simulator to pre-test pedestrian crossing enhancements will be considered. A driver simulator could also be used to confirm results of field analysis. A one-year evaluation period is assumed in the scheduling and budgeting of this task. **Estimated cost:** \$50,000

4. **Recommendations:** The results of Task 3 and discussions with the TAC as well as presentations to the Traffic Operations Leadership Team (TOLT) and the Oregon Traffic Control Devices Committee (OTCDC) will be used to develop recommended guidelines for the use of alternative traffic devices designed to improve pedestrian crossing safety. **Estimated cost:** \$10,000

5. **Reports:** The research team will prepare draft and final reports compiling the results presented in interim reports as well as final recommendations. **Estimated cost:** \$10,000

6. **Project Coordination and Management:** ODOT staff time to coordinate TAC meetings, manage project, and prepare the final report for publication. **Estimated cost:** \$10,000

The project cost estimate is **\$120,000** with a **24-month** schedule.

V. IMPLEMENTATION

Guidelines developed through this project will be incorporated into the Traffic Manual and, as appropriate, be the basis for revisions to standard drawings. Through the process of analyzing pedestrian-related crash data it may be possible to identify a priority list of need pedestrian crossing improvements.

VII. POTENTIAL BENEFITS

As low-cost alternative countermeasures are identified, evaluated, proven effective, and implemented we can expect to see a reduction in pedestrian injuries and fatalities at uncontrolled intersections and mid-block crossings.

VIII. SUBMITTED BY

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