NEW COOPERATIVE RESEARCH PROGRAMS REPORT

Improving Pedestrian Safety at Unsignalized Crossings

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The effectiveness of the many varieties of pedestrian treatments at unsignalized crossings was the subject of a recent research project jointly sponsored by the Transit Cooperative Research Program (TCRP) and the National Cooperative Highway Research Program (NCHRP) and conducted by the Texas Transportation Institute of the Texas A&M University System. The objectives were to

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- Recommend engineering treatments to improve safety for pedestrians crossing at unsignalized locations—particularly intersections served by public transportation—and
- Examine the pedestrian signal warrant in the *Manual on Uniform Traffic Control Devices* (MUTCD) (*1*).

Unsignalized pedestrian crossing treatments in Boulder, Colorado (*above*); Redmond, Washington (*right*); and Salt Lake City, Utah (*above, right*).

After reviewing previous studies, examining all traffic control signal warrants, and conducting workshops to gather engineering judgments on proposed revisions, the research team recommended changes to the pedestrian signal warrant. The Signal Technical Committee of the National Committee on Uniform Traffic Control Devices (NCUTCD) reviewed the recommended revisions to the warrant, and the full NCUTCD endorsed the proposed changes in June 2006.

Quantitative Procedures

To provide more than a menu of possible treatments, the research team developed quantitative guidelines to help engineers and transit agencies determine the recommended treatments that would be appropriate for different street environments and traffic conditions. The Guidelines for Pedestrian Crossing Treatments—included in the research report, *Improving Pedestrian Safety at Unsignalized Crossings* (2)—are the results of the research evaluations. The appendices to the report include details about the field studies and other research efforts (3).

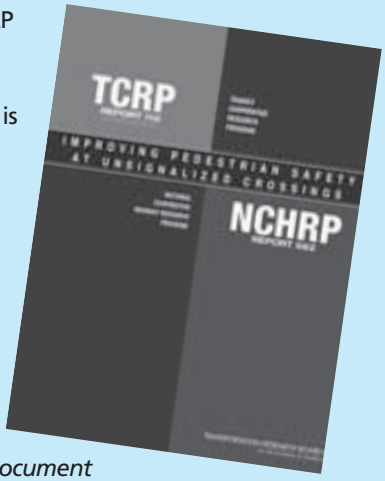
The quantitative procedures in the guidelines use key input variables—such as pedestrian volume, street crossing width, and traffic volume—to identify one of four possible crossing treatment categories:

- Marked crosswalk;
- Enhanced, high-visibility, or "active when present" traffic control device;
- Red signal or beacon device; and
- Conventional traffic control signal.

The guidelines include supporting information for each of the treatment categories, as well as examples of treatments. Worksheets are included with the guidelines to facilitate calculations.

The Transportation Achievement Award for Pedestrians cites the TCRP–NCHRP project for producing "a valuable tool to aid transportation professionals in selecting pedestrian treatments" and "a logical process" for making the selection.

TCRP Report 112–NCHRP Report 562, *Improving Pedestrian Safety at Unsignalized Crossings*, is available from the TRB Bookstore at http://www.trb.org/bookstore/ or can be downloaded at: http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_562.pdf. The appendices, *TCRP Web-Only Document 31/ NCHRP Web-Only Document 91*, can be downloaded at http://www4.trb.org/trb/onlinepubs.nsf/ web/tcrp_web_documents.



Supporting Information

In accomplishing the two main objectives of the study, the research team also developed useful supporting information on pedestrian walking speeds and on the yielding behavior of motorists. The NCUTCD has endorsed the recommended walking speeds for use in signal timing. The results from the study of motorist yielding showed that the crossing treatment, the number of lanes crossed, and the posted speed limit influence motorist compliance.

As a collaboration between TCRP and NCHRP, the project emphasized both roadway and transit considerations. The Institute of Transportation Engineers honored the project with the 2006 Transportation Achievement Award for Pedestrians. The award recognizes significant and outstanding transportation achievements that improve safety in transportation.

References

1. *Manual on Uniform Traffic Control Devices for Streets and Highways*. U.S. Department of Transportation, Federal Highway Administration, Washington, D.C., 2003. http://mutcd.fhwa.dot.gov/. Accessed June 2, 2005.
2. Fitzpatrick, K., S. Turner. M. Brewer, P. Carlson, N. Lalani, B. Ullman, N. Trout, E. S. Park, D. Lord, and J. Whitacre. *TCRP Report 112–NCHRP Report 562: Improving Pedestrian Safety at Unsignalized Crossings*. Transportation Research Board of the National Academies, Washington, D.C., 2006. http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_562.pdf.
3. Fitzpatrick, K., S. Turner. M. Brewer, P. Carlson, N. Lalani, B. Ullman, N. Trout, E. S. Park, D. Lord, and J. Whitacre. *TCRP Web-Only Document 31–NCHRP Web-Only Document 91: Improving Pedestrian Safety at Unsignalized Crossings: Appendices B to O*. Transportation Research Board of the National Academies, Washington, D.C., 2006. http://www4.trb.org/trb/onlinepubs.nsf/web/tcrp_web_documents.