

# Location of Pedestrian Grade Separations: A Priority Ranking System

---

Thomas Batz, John Powers, John Manrodt, and Richard Hollinger, Division of Research and Development, New Jersey Department of Transportation

Pedestrian grade separations provide a means of reducing conflicts between vehicular and pedestrian traffic, thus increasing the efficiency and safety of the transportation system. While some attempts have been made to use economic analysis to justify the construction of pedestrian facilities, a systematic approach has generally been lacking.

This paper proposes an approach that rates alternate sites and lists them in a priority order. This priority ranking system requires a minimum number of measurements and gives a uniform system for comparison of sites. Recommended locations are divided into two categories: (a) those at which pedestrian activity exists, e.g., where pedestrians are observed crossing at grade on the roadway, and (b) those at which pedestrian activity is not possible, e.g., a controlled-access roadway.

The factors included in the ranking system were chosen after aspects of existing and proposed locations for pedestrian grade separations were observed. The importance of each of these factors in relation to the others was subjectively determined and a weighting factor was used to give the desired relationships. We believe that this system presents a workable method of evaluating pertinent field data for locations at which pedestrian grade separation is under consideration.

The factors used to warrant the need for a pedestrian grade separation at a site where pedestrian activity exists are

1. The relationship between volumes of vehicular and pedestrian traffic, with a peak-hour average delay factor applied;
2. The amount of time a pedestrian needs to cross the roadway compared with the maximum time available to pedestrians during green and yellow signals at a signalized site, or the actual sight distance compared with the desirable sight distance at a nonsignalized site;
3. The number of school children;

4. The distance to the nearest alternate crossing, considering the type of protection there; and
5. A judgment value.

The factors used to warrant the need for a pedestrian grade separation at a site where pedestrian activity is not possible are

1. The generation of trips by pedestrians;
2. The distance to the nearest alternate crossing considering the type of protection there; and
3. A judgment value.

We have developed a procedure that explains how all field data should be collected to obtain consistent results. These field data can be processed either manually or by computer. The manual method uses prepared graphs and charts to determine a point score for each factor and a final point score that ranks the priority of each proposed location of the pedestrian overpass.

The second method uses three computer programs that were developed from the manual method as an easy and convenient way to process the data. The first program computes peak-hour pedestrian delay at signalized intersections from the field data, the second computes the priority ranking score for each location from the field and delay data, and the third formats and prints the scores by priority ranking and serves as a data file designed to accept additional scores and rerank the previous locations accordingly.

## ACKNOWLEDGMENT

This report was prepared in cooperation with the Federal Highway Administration. The opinions, findings, and conclusions expressed are those of the authors and not necessarily those of the FHWA.

Descriptions of the manual method, complete with a user's manual, and of the computer programs, with the actual listings, are included in the final report of this project, which can be obtained from the authors, Division of Research and Development, New Jersey Department of Transportation, 1035 Parkway Avenue, Trenton, New Jersey 08625.