The public has expressed concern about the inability of cities and the Texas Department of Transportation (TxDOT) to install traffic signals at locations not meeting the required traffic signal warrants. They are specifically concerned about locations where pedestrians cross the street, especially elderly and disabled pedestrians. A proposed warrant suggested by a citizens group was considered during the 76th Texas Legislative Session.

The current Minimum Pedestrian Volume Warrant is very rarely used to justify the installation of a traffic signal. This rare use may be partly due to the fact that a high number of pedestrians is required and locations with that type of pedestrian traffic typically will meet one of the other warrants.

It may also be partly due to the fact that the required data collection for the Minimum Pedestrian Volume Warrant is very time consuming.

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unwarranted traffic signal. The purpose of this project was two-fold. One objective was to consider pedestrian-related factors and, if appropriate, develop a revised pedestrian warrant or other traffic signal warrant(s) that are practical and easy to use.

A second objective of the project was to develop guidelines for providing a safe and effective pedestrian crossing where a traffic signal may not be warranted. The research team felt that these pedestrian crossing guidelines should outline the numerous design alternatives that are available to address pedestrian safety problems or public concerns at roadway crossings. It is not the intent of the guidelines to recommend a specific pedestrian crossing treatment exclusive of conditions, nor to recommend specific design dimensions. General criteria and design dimensions used elsewhere may be provided with some treatments, but engineering judgment should be used in applying these criteria and designs.

What We Did . . .
For the warranting criteria, researchers performed a literature review on the relevant material and met with the Signals Technical Committee (STC) of the National Committee on Uniform Traffic Control Devices in order to determine the origins of the current pedestrian warrant criteria. A team of engineers also visited five unsignalized locations where pedestrian issues have been a concern. The engineers provided their professional judgment in terms of the traffic control need at the various locations. The engineers reviewed numerous pedestrian planning and design references. Researchers also contacted and interviewed several pedestrian experts about preferred designs and practices for pedestrian crossings. The best practices from these references and experts were compiled into the Pedestrian Crossing Guidelines for Texas.

What We Found . . .
We learned that the current pedestrian warrant signal is the least used warrant to justify the installation of a signal. However, this limited use is not because of lack of effort. Many traffic engineers indicated that the minimum pedestrian volume thresholds are too high and make satisfying the current warrants very difficult. The literature review and STC presentation were inconclusive in terms of identifying the origins of these volumes, although they appear to be indirectly based on research recommendations. The literature review did reveal that the latest revision of the Pedestrian Warrant was the first in the Manual on Uniform Traffic Control Devices (MUTCD) history that did not include a combination of vehicle and pedestrian volumes.

The engineers who made the site assessment visits generally agreed with the current pedestrian warrant results. However, areas for improvement were noted: for instance, combining the vehicle and pedestrian counts on the minor-street approaches and using the current pedestrian warrant as an exclusive mid-block warrant. The engineers also emphasized the need for increased flexibility but with the discretion to decline a signal request when site-specific conditions justify it.

The research team found that many other city and state departments of transportation are faced with similar problems about providing safe pedestrian crossings along roadways with moderate to high traffic volumes. Several of these city and state agencies have developed pedestrian design guidelines or are in the process of developing guidelines for safer pedestrian crossings. The researchers found that there were several features associated with good pedestrian crossing design:

• The street crossing task is made simple and convenient for pedestrians.
• The crossing location and any waiting or crossing pedestrian(s) have excellent visibility.
• Motor vehicle speeds are slowed or controlled in the vicinity of the pedestrian crossing.
• Enforcement personnel use periodic enforcement (where and when necessary) to ensure that vehicle drivers yield the right-of-way to pedestrians.
• Pedestrians are encouraged to use designated crossing locations and to obey applicable state and local traffic laws.

The Researchers Recommend . . .
Three warrant recommendations were made as a result of this project. The recommendations are summarized below with the warrants that are affected for each recommendation. The research shows that results from warrant analyses with the revised warrants better match professional engineering judgment than the results of warrant analyses using the current warrants. The following warrant recommendations should not be used until they are officially adopted by TxDOT.

1. Include pedestrians and cyclists in the minor-street approach volumes for all warrants that currently consider only vehicles for the minor-street approach volumes (Warrants 1, 2, 9, 10, 11, and 12).

2. Include a 30 percent volume reduction factor in the warrants listed here based on the presence of certain types of pedestrian trip generators such as medical facilities, pedestrian transportation facilities, and activity centers serving pedestrians (Warrants 1, 2, 3, 9, 11, and 12).

3. Change the existing pedestrian warrant to a mid-block only pedestrian crossing warrant, remove language about pedestrian crossing speeds, and add a reduction factor for high-speed roadways or built-up areas (Warrant 3).

The Pedestrian Crossing Guidelines for Texas contains best practices for providing safe and effective pedestrian crossings.
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