Coordination of Signalized Crosswalk with Adjacent Intersections

BACKGROUND AND OBJECTIVES

A midblock crosswalk installed on roads with high pedestrian demand provides a safe passage for pedestrians. However, it may decrease vehicle flow performance on arterials with dense signalized intersections in an urban area. Therefore, adjacent traffic signals should be considered when installing a crosswalk. This study explores the impact of the installation of signalized single-stage and two-stage crosswalks on coordinated links and compares their relative effectiveness.

MEASURE OF EFFECTIVENESS

Delay is an important measure of effectiveness and is also important for safety. Hence, cycle length, green splits and offsets are determined simultaneously to minimize the expected average user delay. Average user delay consists of vehicle delay as well as pedestrian delay with equal weightage for both.

RESULTS AND DISCUSSION

- User delay includes pedestrian delay, therefore, higher delay is expected in case of a single stage crosswalk when compared with no crosswalk case.
- Two-stage crosswalks caused pretty low user delays at lower pedestrian demand levels.
- Average user delays for the no-crosswalk and the two-stage crosswalk cases were almost the same at lower vehicle volumes.

FUTURE WORKS

Further study that includes varying link lengths will provide more insight into the impact of signalized crosswalk installation on coordinated links. Further study should also include time consumed while traversing the refuge island and pedestrian interaction.