

DELDOT DESIGNING FIRST HAWK INSTALLATION ON SR 72

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Pedestrian mobility is a major factor in the design of our transportation system. Incorporating effective and safe pedestrian crossings can be a challenge due to geometric constraints, driver and pedestrian compliance, capacity concerns and other constraints. Providing marked crosswalks at uncontrolled locations has been one measure used in an attempt to facilitate crossings; however, there is some controversy regarding the safety of uncontrolled, marked crosswalks. Unprotected/uncontrolled pedestrian crossings often do not meet the required conditions of the pedestrian signal warrant for the installation of a conventional (full) traffic signal. Typically, these crossings are not in close proximity to existing traffic signals where pedestrians can safely cross but forcing pedestrians to walk a long distance out of their intended path to use a signalized intersection can be futile. In recent years, a number of treatments have been introduced in an effort to improve safety at pedestrian crossings. One of those treatments, recently added to the Manual on Uniform Traffic Control Devices (MUTCD) is called a pedestrian hybrid beacon, also termed the “HAWK” (**H**igh Intensity **A**ctivated Cross **W**alk). The State of Delaware is currently nearing completion on the design of the first DelDOT “HAWK” installation.

The first location to have a HAWK installed will be at SR 72 and Farm Lane near the University of Delaware Agricultural facility. This location was identified for several reasons including the relatively high pedestrian usage; the high traffic volumes (24,000 ADT) and speeds (45 MPH posted speed). However, the location has low side street traffic resulting in a traditional signal not being justified.

Prior to installation of the new device, DelDOT conducted research to address potential questions and concerns. The following is a summary DelDOT’s research.

Ineffectiveness of uncontrolled, marked crosswalks

According to the study “Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations” published by the FHWA, the presence of a marked crosswalk alone at an uncontrolled location did not have a significantly lower pedestrian crash rate than that of an unmarked crossing. Also, on multilane roads with traffic volumes greater than 12,000 vehicles per day, a marked crosswalk was associated with a higher pedestrian crash rate when compared to unmarked crossings. The study concluded that adding marked crosswalks alone (with no engineering, enforcement or education enhancement) would not be expected to reduce pedestrian crashes. The ineffectiveness of marked unsignalized crosswalks is likely as a result of improper use by pedestrians. Issues such as pedestrians misunderstanding the legal definition of a crosswalk, assuming that crosswalks are proof that they have the right to share the roadway and

assuming that since the crosswalk is marked it is safer are all potential reasons behind pedestrian crashes at uncontrolled, marked crosswalks.

Crosswalk Treatments Compliance

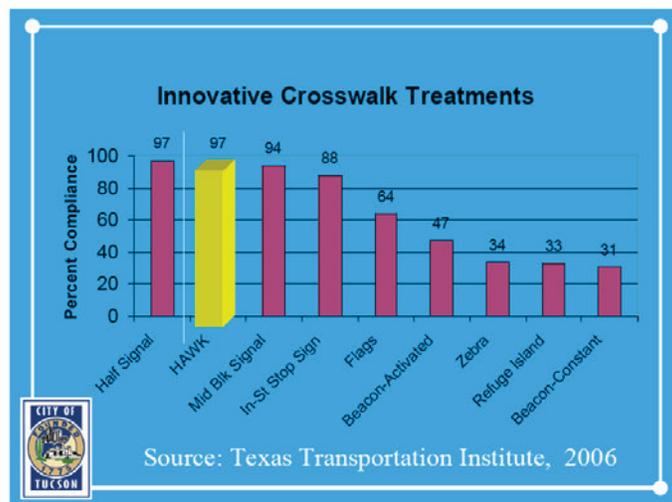
An ongoing concern with all pedestrian treatments is how drivers will react and if they will adhere to the actions that are intended when the device is designed. A series of studies have been completed on some of the most common pedestrian treatments to determine the compliance rates that can be expected.

Generic Red Beacons: Research results indicate that only devices with a red indication were effective at increasing yielding behavior at uncontrolled crosswalks on multi-lane roads to compliance rates more than 90%.

Amber Flashing Beacons: Studies have shown that overhead flashing beacons increased yielding immediately following installation from 8.5% to 42%, and in a long term follow up, yielding remained at approximately 50%.

Amber In-Roadway Lights: An alternative amber indication involves the use of in-roadway lights. A comprehensive study in California found that in-roadway lights increased daytime yielding from 28% to 53%.

Compliance Rates: NCHRP released a report titled “Improving Pedestrian Safety at Unsignalized Crossings” (NCHRP 562) whose main objectives were to recommend specific pedestrian treatments and provide recommendations for incorporation in the future versions of the MUTCD. The report summarized that mid-block signals, half signals and HAWK Signal beacons have the highest compliance of motorists yielding to pedestrians. All of these treatments use a red signal at some point in the cycle to advise motorists of their obligation.



The chart above is based on the results of a study performed by the Texas Transportation Institute on

different crosswalk treatments and their compliance in the city of Tucson, Arizona. From this study, it was concluded that the HAWK beacon was one of the most effective traffic control devices for pedestrian crossings with a 97% driver compliance rate. The study was updated in 2009 and in addition to the compliance rates, a 28% reduction in all crashes and a 58% reduction in pedestrian crashes were found at HAWK beacon locations.

Operation of Pedestrian Hybrid Beacons

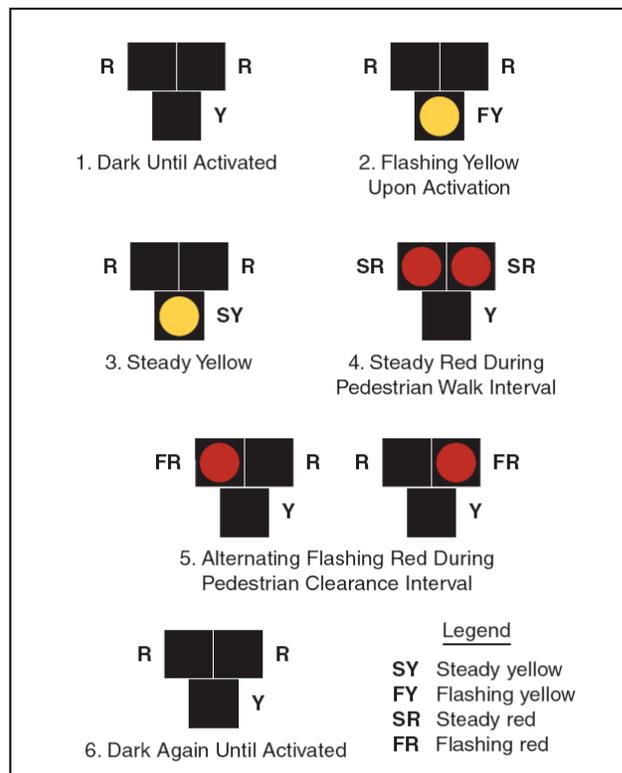
A Pedestrian Hybrid Beacon or HAWK is a traffic control device intended to warn and control traffic at pedestrian crossing locations. It consists of a Red-Yellow-Red signal format for motorists. The signals remain off until a pedestrian activates the system by pressing a button. First, a FLASHING YELLOW light warns motorists that a pedestrian is present. The signal then changes to SOLID YELLOW, alerting drivers to prepare to stop. The signal then turns SOLID RED and shows the pedestrian a "WALK" symbol. The signal then begins ALTERNATING FLASHING RED and the pedestrian is shown a flashing "DON'T WALK" with a countdown timer. Drivers are allowed to proceed during the flashing red after coming to a full stop and making sure there is no danger to pedestrians.

The traffic signal displays, at least two per direction, are mounted on signal poles or on mast arms located over the pedestrian crossing. A Crosswalk Stop on Red sign (R10-23) is also mounted adjacent to the beacon face on each approach and advance pedestrian warning signs (W11-2) may be placed in advance of the crossing.



Summary

According to Mark Luszczyk, DeIDOT's Assistant Chief Traffic Engineer: "The HAWK is expected to provide a reasonably safe pedestrian crossing, while disrupting vehicular traffic flow less than a normal traffic signal. This is accomplished by allowing vehicles to proceed, with caution, during the pedestrian clearance interval. Although the research has shown that drivers understand and generally obey the SOLID RED indication, public education will still be important in explaining the purpose and operations of this new traffic control device."



MUTCD Figure 4F-3. Sequence for a Pedestrian Hybrid Beacon



R10-23
Source: 2009 MUTCD