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RESEARCH PROJECT TITLE

Evaluating the Effectiveness of the City of Des Moines LED and RRFB Pedestrian Crossing Treatments on Multi-Lane Roadways

SPONSOR

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tech transfer summary

Researchers collected and evaluated data from two high-volume pedestrian crossing locations in Des Moines to evaluate the effectiveness of two different supplementary pedestrian-activated sign treatments at those crossings.

Background

The City of Des Moines, Iowa has a number of marked crosswalk locations that are on multi-lane arterial roadways. In an effort to increase the visibility of pedestrians, and to alert motorists to their likely presence, many of these crossing locations have been accompanied by pedestrian-actuated devices.

Research Description and Scope

Des Moines has used two different types of pedestrian-activated crossing treatments, which this research evaluated:

- Push-button-activated pedestrian crossing sign treatment with solar-powered light-emitting diode (LED) yellow lights around the border of the crossing sign
- Push-button-activated rectangular rapid-flash beacons (RRFBs), which use an irregular yellow LED flash pattern that is similar to emergency flashers on police vehicles



LEDs around crossing sign border (left) and RRFB under sign (right)

The data for this study were collected at two pedestrian crossing locations within Des Moines:

- Mercy Hospital Campus crossing of University Avenue at 4th Street (LED sign evaluated)
- Capitol Complex crossing on East Grand Avenue at East 13th Street (LED sign and RRFB evaluated)

This study was limited in scope to these two intersections. The study documented field observations of both pedestrian and motorist reactions. Tabular and graphical comparisons are provided by device type, actuation, location, and time of day in the final report.

Key Findings

- Overall, 85 percent of the crossing events occurred within the crosswalk with no need for pedestrians to wait 80 percent of the time. When pedestrians needed to wait for traffic, it mostly occurred on the curb (15 percent of the time). Crosswalk usage varied from 76 to 100 percent.
- The devices were activated 54 percent of the time, overall; however, specific rates varied across locations and time of day from a high of 73 percent activation to a low of 26 percent.
- Overall, pedestrians yielded prior to crossing 20 percent of the time. This varied by location, device type, and time of day. Pedestrian yielding varied by location and time of day from a low of 4 percent at the Capitol Complex RRFB crossing to a high of 55 percent at the Mercy Hospital Campus LED crossing, both during the a.m. period with the devices activated.

- Overall, 93 percent of the crossing events were completed while walking. Pedestrians ran 7 percent of the time and only 1 crossing was aborted.
- Overall, motorist braking actions were observed 39 percent of the time as opposed to no braking 24 percent of the time. A lack of braking was found to range from a low of 8 percent at two locations to a high of 59 percent at the Capitol Complex LED p.m. observation. In more than a third of the cases (37 percent) overall, no vehicles were present during the pedestrian crossing.
- Overall, motorists stopped for pedestrians 34 percent of the time versus no change in speed 20 percent of the time and slowing 9 percent of the time. Motorists stopping for pedestrians across locations ranged from a high of 44 percent to a low of 22 percent.
- When activated, motorists stopped for pedestrians in the crosswalk more than when the devices were not activated (72 versus 24 percent of the time).
- Pedestrians ran across the street more when the devices were not activated.
- The only instance of an aborted crossing occurred when the pedestrian had not activated the device.

Implementation Readiness and Benefits

Based on the findings of this study, the City and possibly other communities may be able to make more informed decisions when considering the design, orientation, and operational treatments for pedestrian crossing locations.



Street view approaching signs with LEDs around them



Street view approaching sign with RRFB under it