Research Notes

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Drivers are Stopping for Pedestrians on the Bend Parkway

Rectangular Rapid Flashing Beacons (RRFBs) consist of two rectangular yellow beacons placed about seven inches apart below a pedestrian or school crossing sign at a crosswalk. The beacons, along with the signs and pavement markings, are designed to increase the visibility of persons using the crosswalk. The devices are activated by a push button or passive pedestrian detection. Solar panels are often attached to power the systems.

RRFBs have been installed at several dozen crosswalks in Oregon in the last few years; most on roads with posted speeds of 30 to 40 mph. Last summer the Oregon Department of Transportation (ODOT) installed RRFBs at the Reed Lane and Badger Road intersections on the Bend Parkway (US 97). The posted speed on the Parkway is 45 mph and the prevailing speed is about 10 miles per hour greater.

The Bend Parkway is a four-lane facility with a center median, bike lanes, and sidewalks. The higher speeds of the Bend Parkway require additional features to alert drivers of the crossings and increase the safety of the pedestrians and bicyclists using the crosswalks. These include RRFB assemblies on the side of the road and on the median at the crosswalk and 500 feet in advance of the crosswalk. Pavement markings include ladder bars with a continental crosswalk, a stop line 50 feet in advance of the crosswalk, and double white solid "no lane change" lines. As drivers approach the intersection, they see the legend "PED X-ING" on the roadway.

Prior to the installation of the RRFBs, data were collected at both the Reed Lane and Badger Road intersections on driver yielding rates and compliance. It was found that 23% of the vehicles yielded for pedestrians at the Reed Lane crosswalk and 25% of the drivers yielded at the Badger Road intersection. After the RRFBs were installed, data on driver yielding rates were again collected. It was found that driver yielding rates had increased to 83% at both intersections. The number of conflicts had declined.

The conclusion of the study was that RRFBs can enhance the safety of pedestrians crossing higher speed roadways if the design includes features such as the following:

- RRFBs and fluorescent yellow Bicycle/Pedestrian signs placed on both sides of the roadway (on the median, if possible) at the crosswalk and approximately 500 feet in advance of the crosswalk.
- Clearly marked crosswalks with a stop line installed in advance of the crosswalk.
- "Stop Here for Pedestrians" signs installed in advance of the marked crosswalks.
- Double white solid "no lane change" lines installed in advance of the crosswalk to deter vehicles from passing a stopping vehicle.

The evaluation of the installations and observations of those involved in the operation suggest the following recommendations applicable to all new RRFB installations:

- All new installations of RRFBs should include an evaluation of pre- and post-RRFB installation driver compliance. Not only is it valuable to know whether the installation of the RRFBs has been beneficial in increasing driver compliance, it also provides an opportunity to observe how the intersection is used.
- The operation of RRFBs should be observed closely for the first few months after their installation. Using video to record how pedestrians and bicyclists are using the crosswalks is very beneficial. Operational concerns can be identified and corrected quickly. Examples of corrections include the need to trim vegetation to improve visibility and the need for additional signing or pavement markings.

Driver's perspective of RRFB installation at the Bend Parkway and Reed Lane

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The final report for this project was published in December 2012 on the Research Section's web page:
http://www.oregon.gov/ODOT/TD/TP_RES/docs/Reports/2011/SPR721_bend_rrfb.pdf