Background / Overview
Rectangular Rapid-Flashing Beacons (RRFBs) are a pedestrian crossing warning device, which are typically mounted to pedestrian warning signs and similar in operation to emergency flashers on police vehicles. The device was introduced as an alternative to traditional overhead or side-mounted yellow flashing beacons, and newer in-roadway “YIELD TO PEDESTRIAN” signs and lights. The LED flasher illuminates in a wig-wag sequence (left and then right). The effect has been described as a “stutter flash effect.” FHWA’s research project “Effects of Yellow Rectangular Rapid-Flashing Beacons on Yielding at Multilane Uncontrolled Crosswalks” evaluated RRFBs effectiveness in increasing driver’s yielding to pedestrians on high-volume, multilane crosswalks. The results indicate rectangular LED yellow RRFBs appear to be an effective tool for producing large numbers of drivers yielding right-of-way to pedestrians in crosswalks at sites where motorists rarely yielded. Also, the results seem to be maintained over time.

Benefits
• Effective - driver’s yielding rates exceed 80% in most cases;
• Bright - surpasses FHWA minimum standards for size and brightness;
• User-actuated - activated by pedestrians manually by a push button or passively by a pedestrian detection system;
• Easy Installation - spread spectrum radio and optional solar power eliminate the need for trenching and bringing AC power to the site; and
• Cost effective - Saves time and money by employing solar and spread spectrum wireless technologies.

Costs
• Approximately $10,000 to $15,000 for purchase and installation of two units (one on either side of a street). The cost includes:
  o Solar panels for powering the units;
  o Pad lighting;
  o Indication units (for both sides of street) with RRFBs in the back and front of each unit;
  o Signage on both approaches, all posts, and either passive infrared detection or push buttons with audio instructions.
• Costs would be higher for additional units placed on a median island, etc.

RRFB’s Interim Approval by the MUTCD
The MUTCD gave interim approval to RRFBs for optional use in limited circumstances in July 2008. The interim approval allows RRFB’s usage as a warning beacon to supplement standard pedestrian crossing warning signs and markings at:
• a pedestrian or school crossing, where the crosswalk approach is not controlled by a yield sign, stop sign, or traffic-control signal; or
• a crosswalk at a roundabout.

FHWA’s Study of RRFB (2010)
Five experiments examined the efficacy of RRFBs to increase driver yielding rate.
• 22 sites in 3 cities in the United States (St. Petersburg, FL; Washington, DC, and Mundelein, IL) (19 sites are in St. Petersburg, FL);
• Data were collected over a 2-year follow-up period at 18 of these sites to determine the long-term effects of the RRFB treatments.
• Results:
  o 26% yielding rate before installation of RRFB;
  o 72-96% yielding rate after installation of RRFB;
  o Two-Beacon vs. Four-Beacon: yielding rate is 81.2% vs. 87.8%;
  o Day vs. Night (Two Beacon): yielding rate is 86.7% vs. 84.6%;
  o Standard Beacon vs. RRFB (Two Beacon): yielding rate is 15.5% vs. 78.3%.

RRFB’s in Other States
• As of 2008, RRFBs have been installed in Florida, New Mexico, Illinois, and Washington D.C.
• Pennsylvania DOT developed “Interim Approval Requirements for RRFB” for statewide application of RRFB in order to provide state specific requirements to ensure the compliance with MUTCD in 2009.
• Oregon DOT requested interim approval from FHWA for the use of RRFB in 2008.
• Except for the FHWA’s study, no other significant research effort about the evaluation of RRFB is found in other states.

Additional Resources
• [http://www.co.washington.or.us/LUT/TransportationProjects/rrfb.cfm](http://www.co.washington.or.us/LUT/TransportationProjects/rrfb.cfm)

References