

Information for our Staff and Clients Regarding the Federal Highway Administration's Recent Rescission of Interim Approval for Rectangular Rapid Flashing Beacons (Updated Guidance as of 2/14/18)

The Federal Highway Administration (FHWA) [has rescinded its approval](#) of new installations of Rectangular Rapid Flashing Beacons (RRFB), effective December 21st, 2017, due to on-going patent lawsuits regarding the design of the RRFB. There are multiple lawsuits between the inventor of the RRFB (Stop Experts) and several traffic control device manufacturers who are selling RRFBs.

Contested Elements of RRFB Design

The flash patterns used in RRFBs are being contested in court. These patterns include sequences that flash 2 times on one side, 3 on the other, or similar 2-to-4 and 2-to-5 sequences. The lawsuit also claims that the patent covers the delay between the flash patterns. According to the lawsuits, the key parameter is the flash pattern, and not simply the shape of the LED housing, therefore circular LED beacons with modified flashing patterns may also be challenged. The US Patent Trademark Office is re-examining the patents, but the process may take as long as three years to complete.

Individual State Guidance

Many state agencies and DOTs have provided guidance related to this issue, which should be consulted when preparing projects in those jurisdictions. Some of these guidance documents recommend experimenting with other flash patterns or beacon shapes. Designers are cautioned that some of these agency recommendations may be subject to additional lawsuits or liability risk related to existing patents.

This rescission caught many state and local agencies by surprise and has left questions about how to proceed with current projects where RRFBs were planned to be installed. This fact sheet was prepared by Toole Design Group in an effort to quickly provide information to our staff and clients about how to proceed with these projects.

This information should not be construed as legal advice. We encourage our clients to work with their legal departments to determine their own course of action regarding RRFB installations.

What are the implications for existing RRFBs and how does it impact agencies?

As described in FHWA's December 21st Memorandum, "Installed RRFBs may remain in service until the end of useful life of those devices and need not be removed." Prior to the recession memo, there was a presumption that the RRFB did not violate a patent protection.

When FHWA rescinded the interim approval, the administration made it clear they will not approve experiments to use the RRFB because the MUTCD explicitly prohibits the use of patented traffic control devices on the public roadway system. The installation of new RRFBs could therefore present a liability risk for agencies if they install an RRFB after December 21st, 2017. As a result, it is not recommended that RRFBs be proposed or installed on public roads until the patent issue is resolved.

Agencies that have purchased (or have executed contracts to purchase) RRFBs but have not yet installed them are in a unique position. Since its initial memo, FHWA has released responses to [frequently asked questions \(FAQ\)](#) related to the decision, that includes some clarification on the subject. Agencies which had interim approval to install RRFBs may complete the installation of the RRFB if projects were

in procurement or had construction plans underway prior to December 21, 2017. We recommend that agencies consult their legal counsel and their FHWA Division office to identify what constitutes a construction plan underway. For new projects or agencies that did not have interim approval from FHWA to use RRFBs prior to December 21st, we recommend that the agency substitute one of the alternatives described below where appropriate.

When existing RRFB devices are damaged and require replacement, it is recommended that the device be removed at the crossing location and replaced with another treatment described below. If the device can be serviced with minimal effort or replacement parts to operate as intended, the device may remain in place.

What are potential alternatives to the RRFB?

It will now be necessary for agencies to consider other treatments to improve pedestrian and bicyclist safety at uncontrolled crossings. RRFBs have most commonly been used on roadways with 8,000 - 20,000 vehicles/day operating with 2 to 4 lanes of through traffic and operating speeds up to 40 miles per hour (mph). Above 40 mph, [NCHRP Report 562](#) research recommends the use of a traffic signal or pedestrian hybrid beacon displaying a red indication to require traffic to stop.

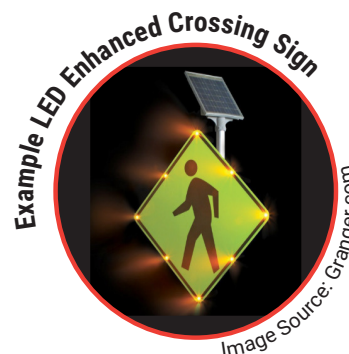
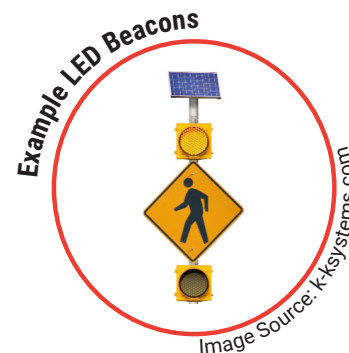
Research consistently shows motorist yielding at uncontrolled crossings decreases substantially as:

- traffic volumes approach 9,000 vehicles/day;
- vehicle speeds exceed 30 mph; and/or
- the number of travel lanes to be crossed exceeds two through lanes.

Furthermore, research finds a significant percentage of pedestrian crashes occur during periods of darkness and injury risk increases substantially at vehicle speeds above 30 mph.

To improve the safety of pedestrians and bicyclists at uncontrolled locations, practitioners should consider the following [proven safety countermeasures](#) that address motorist speed and bicyclists and pedestrian exposure. These are also key strategies found in the [Safe Transportation for Every Pedestrian \(STEP\)](#) initiative:

- Crosswalk visibility enhancements, including a variety of measures such as overhead illumination and enhanced signing and marking of crosswalks. These have been found to help drivers detect pedestrians, especially at night.
- Pedestrian Hybrid Beacons (described at the end of this memo).
- Raised crosswalks (described in the next section under “Existing MUTCD Treatments”).
- Road diets, which can reduce vehicle speeds, and provide space to add new pedestrian crossing facilities, which can reduce pedestrian crossing distances.
- Refuge islands at least 6 feet in width for pedestrians, 8 feet in width for bicyclists.



In addition to the strategies listed above, agencies can consider reducing speed limits based on FHWA's [U.S. Limits 2 Methodology](#), which recommends the use of the 50th percentile rather than 85th percentile at locations with regular bicycle and pedestrian activity. This strategy is also discussed in FHWA's [Achieving Multimodal Networks – Applying Design Flexibility & Reducing Conflicts](#).

Also, while they are not yet included in the Highway Safety Manual as proven countermeasures, research indicates that the following MUTCD treatments have been shown to increase motorist yielding when installed in appropriate contexts:

- **Flashing LED Beacons** are MUTCD compliant and may be used to supplement pedestrian crossings. They can be actuated with a push button or passive detection, and can be solar powered. Costs are similar to the cost of an RRFB. If considered, the beacons should not flash continuously; rather they should be activated only when a crossing user is present. See MUTCD [Section 4L.03 Warning Beacon](#) for more information. An example of this type of beacon is the [cross alert system](#).
- **LED Enhanced Crossing signs** (W11-1, W11-2, or W11-15) are MUTCD compliant when the LED lights are contained within the border of the sign; this is considered to enhance the visibility of the sign. They may be actuated with a push button or passive detection, and can be solar powered. The brightness of the LEDs will affect the visibility of the signs, so high-intensity LEDs should be used. Costs are similar to the cost of an RRFB. If considered, the beacons should not flash continuously; rather they should be activated only when a crossing user is present. See [MUTCD Section 2A.07 Retroreflectivity and Illumination](#) for more information.
- **Advance stop or yield lines** with appropriate signs as approved in the MUTCD (desirable at all multiple-threat crosswalks). See [MUTCD Section 3B.16 Stop and Yield Lines](#) for more information.
- **Street lighting** can be installed at the crossing at locations where night-time safety is a concern.
- **Raised crosswalks** are a geometric design feature that can help to reduce speeds at the location where pedestrians are expected to cross. They are most appropriate on streets with speed limits of 30 mph or less. Local agency policies which restrict the use of raised crosswalks to local streets should be reevaluated, as many agencies have successfully deployed raised crosswalks to reduce speeds and improve safety on collector and arterial streets that are intended to operate at lower speeds. [Cambridge, Massachusetts](#) has extensive experience installing raised crosswalks (example design detail [here](#)) throughout the city.



- **R1-6 STOP (or YIELD) TO PEDESTRIANS** signs deployed in a gateway configuration by locating signs on the left and right side of the travel lane. [Research](#) in Michigan on roadways with speed limits of 35 mph or less has found improved yielding rates with this design treatment.
- **Overhead Pedestrian Crossing Signs:** Pedestrian crossing signs and Stop (or Yield) to Pedestrian signs may be mounted over the roadway to inform drivers on multilane roads of the crosswalk. These may be supplemented with LED beacons or other treatments identified above.
- **Pedestrian Hybrid Beacons or Traffic Signals:** At locations where the previous treatments are not viable or on roadways where motorist operating speeds exceed 35 mph, it may be necessary to consider a MUTCD-compliant [pedestrian hybrid beacon \(informally known as a HAWK signal\)](#) or a traffic signal to provide a safe crossing. It is important to be aware that existing pedestrian volumes may be suppressed due to the traffic volume or operating speed characteristics of the roadway. In these circumstances, the [FHWA recommends projected volumes](#) be used to evaluate MUTCD warrants.

Contact us

If you have further questions about the use of RRFBs, you are welcome to contact the following Toole Design Group staff members for more information:

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The contact for this action from the Federal Highway Administration is **Kevin Sylvester**,
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For more information on the MUTCD, click [here](#). For FHWA guidance on treatments for uncontrolled, marked crosswalks, click [here](#).