

TECH BRIEF



Pedestrian Refuge Islands

Why did the chicken cross the road?

While answering this question, why may not be important, but assuring there is a safe and accessible way for people (and their animals) to get across the road is.

On highway projects in urban and suburban areas, including small towns, it is critical to design and build facilities that allow for non-motorized users to travel between homes, businesses, bus stops, schools and parks. It is common for designers to include a five-foot wide sidewalk with buffer zone or occasionally a shared-use path parallel to the roadway.

In addition to walking parallel to the road, pedestrians often need to cross the road to reach their destination. Current practice in Kentucky has been to primarily design pedestrian crossings only where there is a traffic signal. However, many of the highway projects that include sidewalks are in small towns or cities where there are few traffic signals. Some projects are located where signals are spaced far apart.

So how do we expect pedestrians to get across? Should they walk, in some cases, hundreds or thousands of feet out of their way to access a signal? Research shows people will normally only go 50 feet out of their way for

a crossing. Pedestrians tend to try to minimize their walking distances which often means crossing the highway mid-block or between traffic signals and intersections.

In Kentucky, pedestrian crashes account for about 7 percent of all traffic fatalities. Nationally, 75 percent of pedestrian fatalities occur at non-intersection locations. As part of a roadway improvement project, designers should consider areas where the public is currently crossing, areas they will likely want to cross, and at those locations, how best to provide safe, accessible crossings.

Pedestrian Refuge Islands

A pedestrian refuge island is a raised median placed on a street at intersections or mid-block locations. They promote safer crossing by separating and protecting pedestrians from motor vehicles as they make a two-stage crossing.

It is a tool recognized by the Federal Highway Administration as a measure to improve pedestrian safety. The islands reduce the exposure time experienced by pedestrians as they cross a road and may reduce pedestrian crashes by up to 46 percent. They simplify the decision making during crossing by allowing pedestrians to judge gaps in traffic one direction at a time. This can also result in reduced delays for people crossing the road.

References

- Guide for the Planning, Design, and Operation of Pedestrian Facilities, AASHTO, July 2004.
- MUTCD 2009 with revisions 1 & 2.
- Pedestrian Countermeasure Policy Best Practice Report, FHWA, 2011.
- Pedestrian Road Safety Audit Guidelines and Prompt Lists, FHWA, July 2007.
- Pedestrian Safety Guide and Countermeasure Selection System, PEDSAFE, www.pedbikesafe.org.
- Safety Effects of Marked versus Unmarked Crosswalks at Uncontrolled Locations, FHWA, 2005.
- Transportation Research Record, Journal of the TRB, NO 2299, Pedestrians 2012, pp100-109.
- Urban Street Design Guide, NACTO, 2014.



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Crossing Location

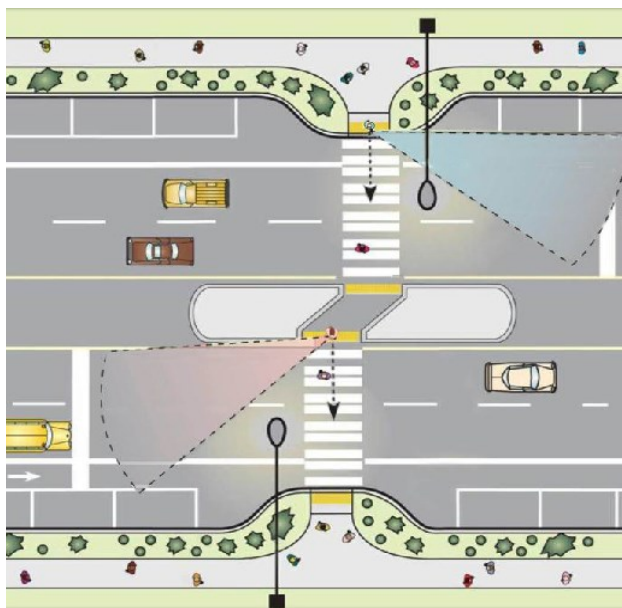
There are two parts to determining the best locations for pedestrian crossings. Beyond just locating crossings at traffic signals, consider the land uses (pedestrian generators) that people will likely try to access most. Is there a grocery store, subdivision or a popular shopping center? Is there a park or a school? These types of locations attract pedestrians. Ideally, there would be a crossing no more than a standard block length, roughly one-eighth of a mile (600-800 feet) apart. A crossing may be needed if the distance between signalized intersections is greater.

The second part of locating a crossing is trying to find a spot that does not conflict with turning vehicles. On a road with good access control, this may not be difficult. On a roadway with "by-permit" access control, the only choice may be near an existing entrance. In that case, it would be best to choose a minor entrance that does not generate much traffic, such as a single family home or small business.

Design

There are a few things that should be considered in the design of a refuge island. First, it is preferred, not required, that the median be raised on each side of the crosswalk in order to provide a physical barrier from vehicles. The gap in the median should be at least 6 feet wide and at least as wide as any crosswalk markings used. It may be wider in areas where large pedestrian volumes are present. The median should be at least 6 feet wide but preferably 8 feet or more to provide for multiple people, including those who may be pushing strollers or walking pets. A 4-foot wide median may be acceptable if there are limitations on available space within the right of way.

Providing adequate sight distance between approaching motorists and pedestrians is critical to a safe crossing. Keeping landscaping, signage and light poles out of the lines of sight is also necessary. The crossing should be fully accessible, including ramps with the appropriate slope and truncated domes (detectable warnings) by the roadway edge. The walkway in the median may be left flush to the roadway surface. Drainage should be designed to avoid water flow or standing water within the gap of the median and ramps.



The crosswalk may be offset, with the portion in the median angled toward oncoming traffic in each direction. This design encourages pedestrians to pause and look toward traffic before traversing the second half of the crossing.

Signals and Markings

Coordination with the Division of Traffic Operations is recommended when deciding necessary traffic control devices where a refuge island is installed away from a signalized or stop-controlled intersection. An engineering study may be needed to determine the appropriate signalization, if any, pavement markings and signage.

Research has shown that marked crosswalks on multi-lane roadways by themselves, without a raised median or signalization, may be less safe than an unmarked crosswalk. However, other research has shown that marking high visibility crosswalks along with refuge islands significantly improves the observation behavior of pedestrians and yielding behavior of drivers.

Liability

A project manager may have concern that installing an unsignalized crossing increases liability. KYTC highway designers have qualified immunity when making discretionary decisions (using professional judgment). Most design-related decisions fall into that category. The decision to install a pedestrian refuge island is defensible when a project manager documents why it is needed at a specific location and employs a good design. If there is a decision not to use an island or other control to assist pedestrian crossings, it is important that it also be documented.