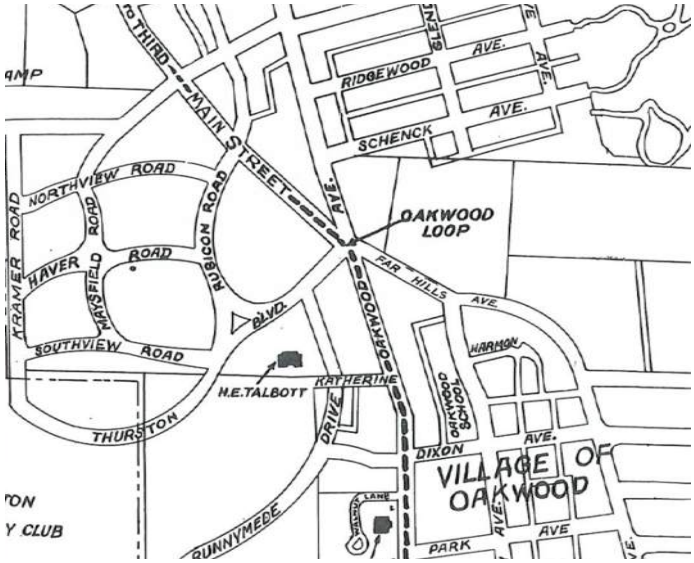
PROJECT FACT SHEET

OAKWOOD FIVE POINTS INTERSECTION

Project Background

The intersection of Far Hills Avenue (SR 48), Oakwood Avenue, and Thruston Boulevard is called Five Points. The map to the right is on page 119 of the book *Oakwood: The Far Hills*, our city history book. It shows the Five Points intersection in the 1920s. The genesis of the Five Points name comes from this… when it truly was five points. The eastern leg of Thruston Boulevard, as it exists today, was originally not a public road, but private driveway to the Patterson home that was located at the top of the Thruston Boulevard hill, now the site of the Lutheran Church of our Savior.



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The Five Points intersection has been controlled by a traditional traffic signal for decades. The signal system was last rebuilt in 1995 and is approaching the end of its useful life.

Project Description

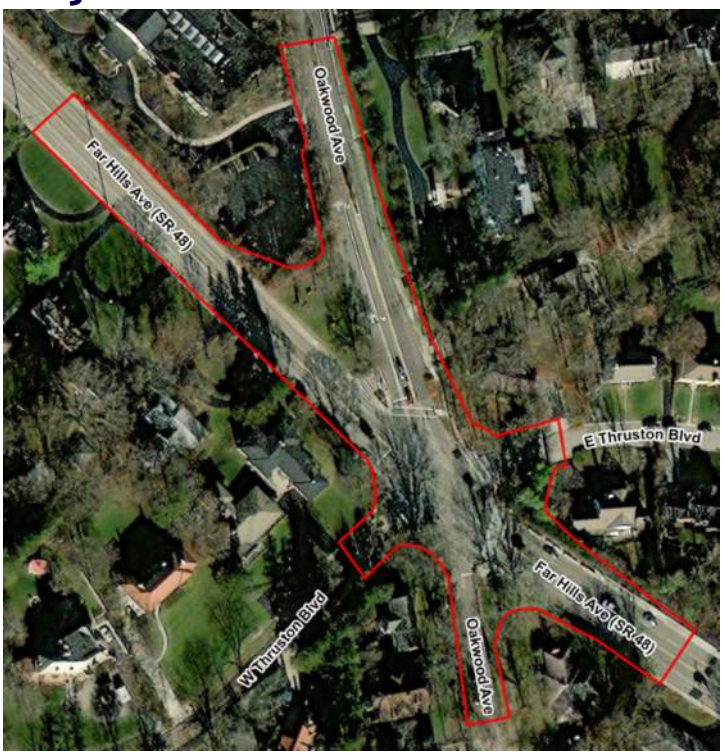
A traffic signal system study was commissioned to develop a long-range plan for major capital improvements to Oakwood's traffic signal system. Much of the system will reach the end of its useful life over the next 5-10 years. The city is studying the Five Points intersection to determine if it might function better as a roundabout.

The Five Points intersection is the most complex intersection in Oakwood, and its design is central to the safe and efficient movement of traffic. The safety of pedestrian traffic is a primary factor as the city studies and evaluates alternate intersection designs.

The purpose of this project is to improve efficiency and safety at the intersection. A roundabout would involve full reconstruction of the intersection as a peanut shaped roundabout configuration to minimize impacts to adjacent property. This project would also include construction of crosswalks for pedestrian safety and mobility and roadway curbs and gutter sections to better control drainage on the pavement and meet current design standards.

PROJECT FACT SHEET

Project Area



Traffic Intersection Control

There are three typical methods of controlling the flow of traffic at roadway intersections:

- Stop signs
- Traffic signals
- Roundabouts

The preferred method is dependent upon several factors, most notably:

- Type of traffic (e.g., vehicles, pedestrians, cyclists, etc.)
- Volume of traffic
- Roadway geometry

Why are Roundabouts so Popular?

Traffic safety studies show they:

- Slow down traffic
- Reduce serious crashes
- Reduce the severity of injuries at crashes
- Can move traffic more efficiently
- Are more environmentally friendly

Project Comments

Comments about this project are welcomed and encouraged. Please submit comments via phone, email, or mail to:

City of Oakwood
Attn: City Manager's Office
30 Park Avenue
Oakwood, OH 45419
(937) 298-0600
Email:
fivepoints@oakwoodohio.gov

Comments on the proposed alternatives should be submitted by **August 11, 2023** to be documented in the Public Input Summary Report.

The city will respond to all comments received. Please reference Five Points Intersection in emails and in letters.

We have not made a decision about the future design of the Five Points intersection and will not make a decision until a thorough analysis is completed that details the pros and cons of traditional signalization versus a roundabout, and until we hear from the citizens of Oakwood and the general public.

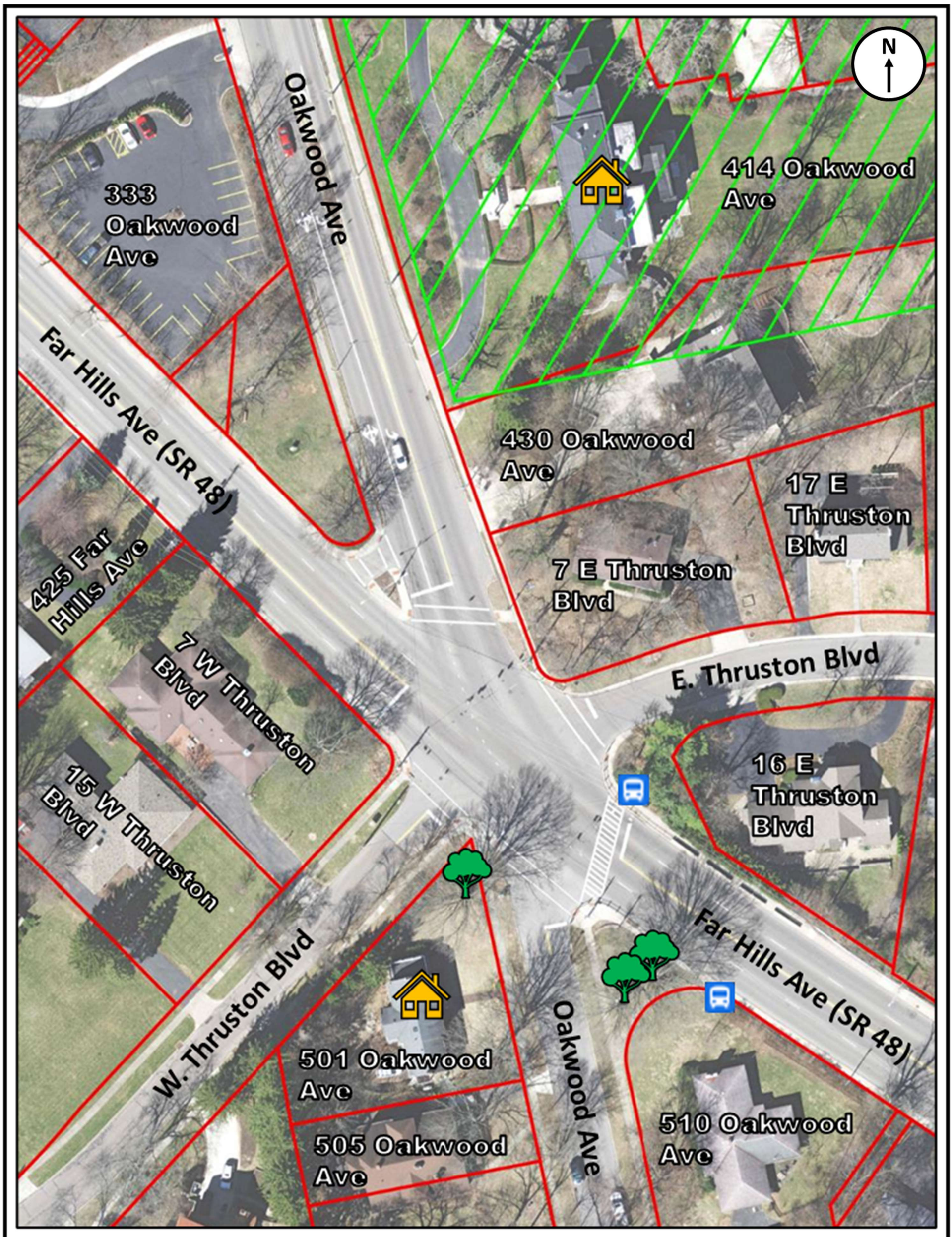
How do Pedestrians, Cyclists, etc. Safely Cross at a Roundabout?

Two options to enhance crossings of pedestrians, cyclists, etc. at multi-lane roundabouts include the following:

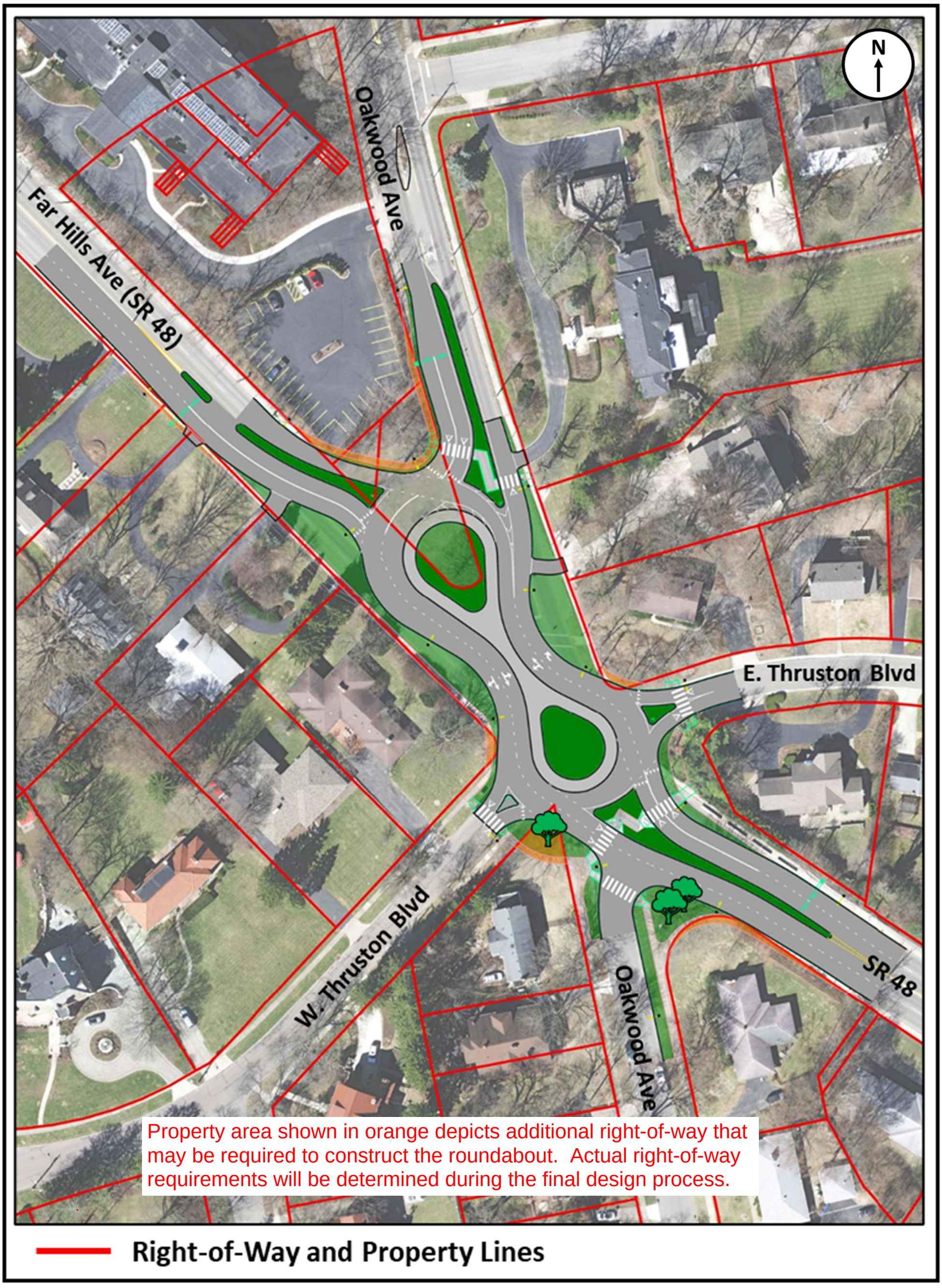
- Rectangular Rapid Flash Beacon (RRFB): the RRFB system uses an advance warning flasher and signage to inform motorists that users of the crosswalk are present as implemented on Shroyer Road. It also incorporates raised crosswalks.
- Pedestrian Hybrid Beacon (PHB): the PHB system uses signals to stop motorists when a crosswalk user is present. The signal indications are dark when not active unlike a traditional traffic signal.

ROUNDABOUT CONCEPT PLAN

EXISTING CONDITIONS



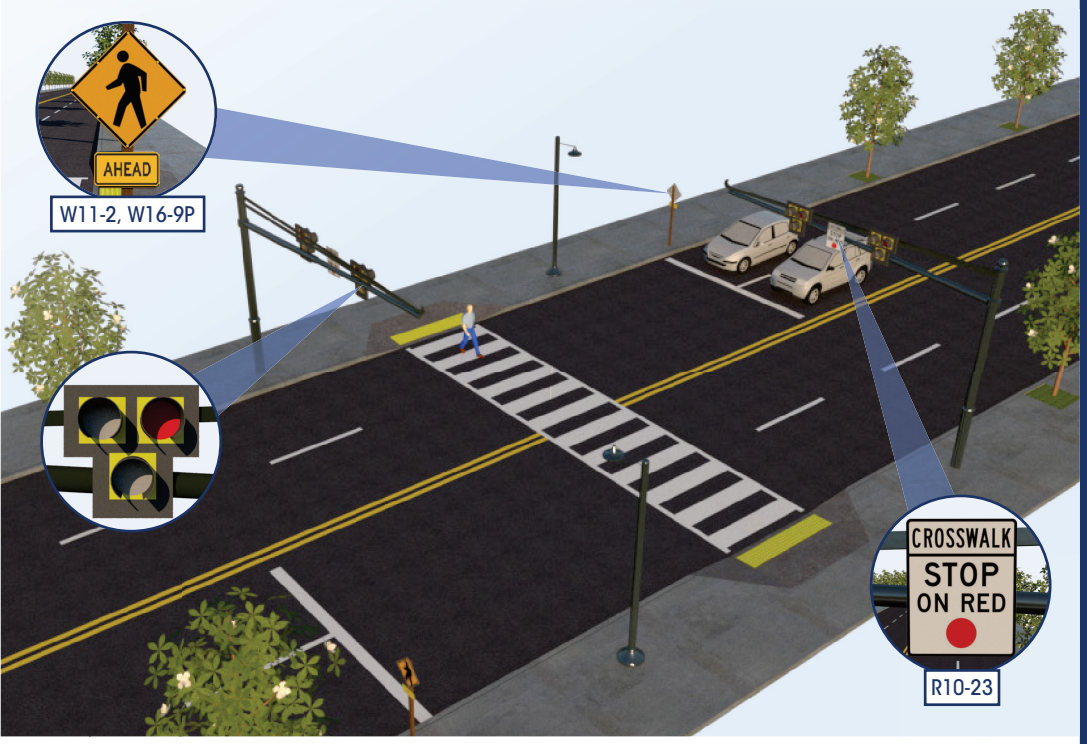
PROPERTY IMPACTS



Pedestrian Hybrid Beacon (PHB)

SAFE TRANSPORTATION FOR EVERY PEDESTRIAN

COUNTERMEASURE TECH SHEET



A Pedestrian Hybrid Beacon head consists of two red lenses above a single yellow lens. Unlike a traffic signal, the PHB rests in dark until a pedestrian activates it via pushbutton or other form of detection. When activated, the beacon displays a sequence of flashing and solid lights that indicate the pedestrian walk interval and when it is safe for drivers to proceed (see figure on back page).

The PHB is often considered for installation at locations where pedestrians need to cross and vehicle speeds or volumes are high, but traffic signal warrants are not met. These devices have been successfully used at school crossings, parks, senior centers, and other pedestrian crossings on multilane streets. PHBs are typically installed at the side of the road or on mast arms over midblock pedestrian crossings.

High speeds and multiple lanes of traffic create challenges for pedestrians crossing at unsignalized locations.

PHBs can warn and control traffic at unsignalized locations and assist pedestrians in crossing a street or highway at a marked crosswalk.

PHBs can reduce pedestrian crashes by **55%**

FEATURES:

- Beacons stop all lanes of traffic, which can reduce pedestrian crashes.

OFTEN USED WITH:

- High-visibility crosswalk markings
- Raised islands
- Advance STOP or YIELD signs and markings

U.S. Department of Transportation
Federal Highway Administration

Safe Roads for a Safer Future
Investment in roadway safety saves lives

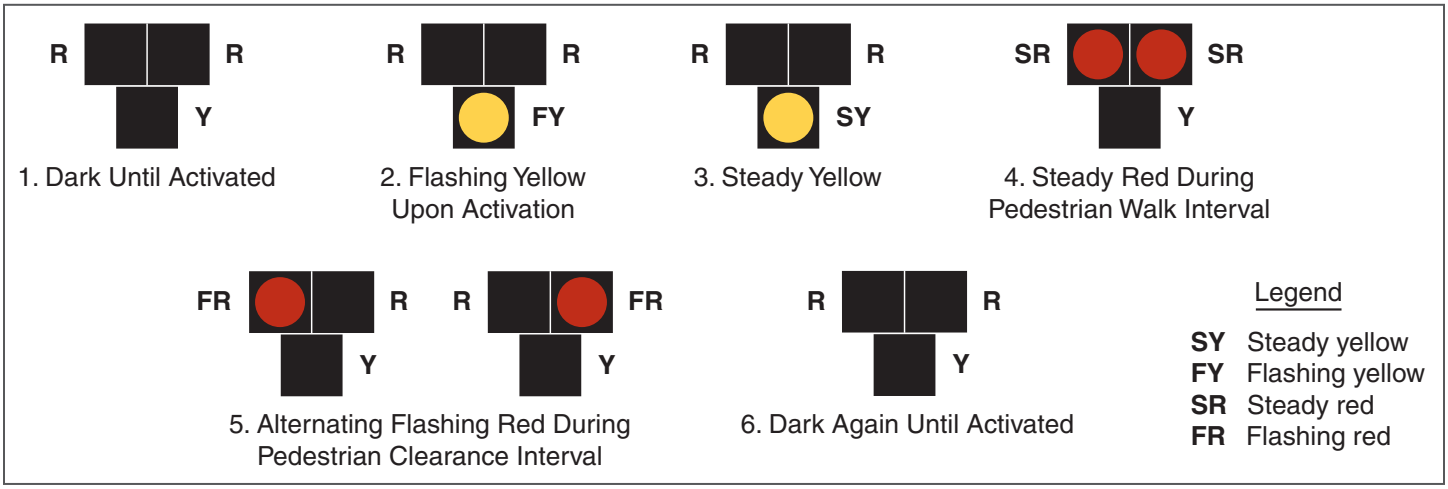
EDC

June 2018, Updated | *FHWA-SA-18-064*

Pedestrian Hybrid Beacon (PHB)

EDC-4 STEP: https://www.fhwa.dot.gov/innovation/everydaycounts/edc_4/step.cfm

Figure 4F-3. Sequence for a Pedestrian Hybrid Beacon from FHWA's *Manual on Uniform Traffic Control Devices*, 2009 Edition, p. 511



When a pedestrian activates a PHB, a flashing yellow light is followed by a solid yellow light, alerting drivers to slow. A solid red light requires drivers to stop while pedestrians have the right-of-way to cross the street. When the pedestrian signals display a flashing DON'T WALK indication, the overhead beacon flashes red, and drivers may proceed if the crosswalk is clear.

References

Zegeer, C., R. Srinivasan, B. Lan, D. Carter, S. Smith, C. Sundstrom, N.J. Thirsk, J. Zegeer, C. Lyon, E. Ferguson, and R. Van Houten. (2017). NCHRP Report 841: Development of Crash Modification Factors for Uncontrolled Pedestrian Crossing Treatments. Transportation Research Board, Washington, D.C.

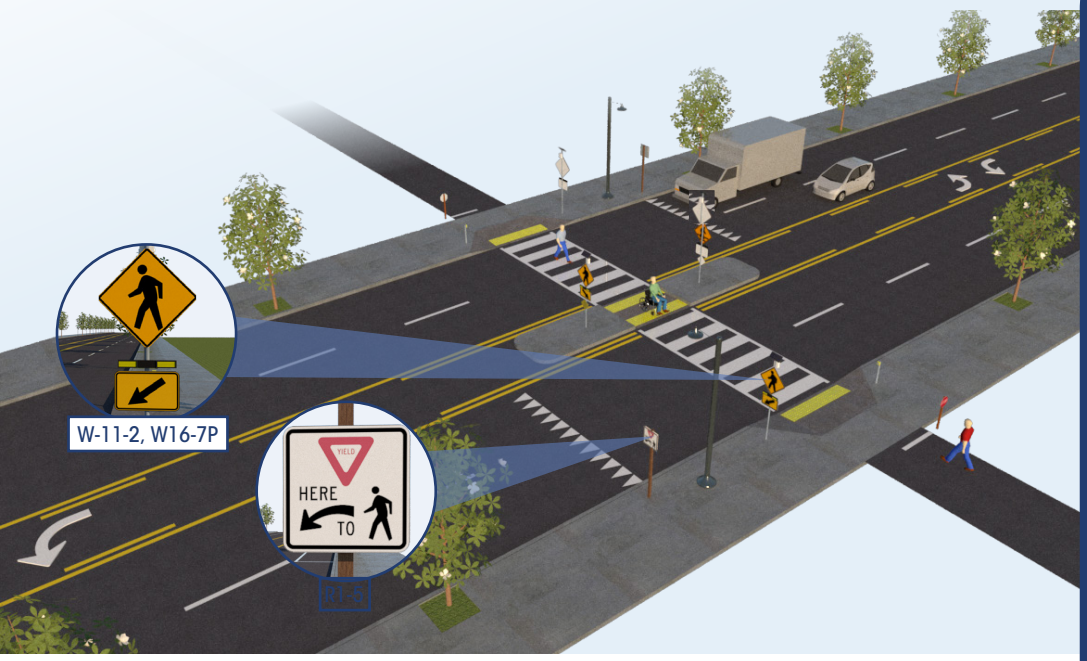
Federal Highway Administration. (2013). "Pedestrian Hybrid Beacon" in PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System. Available: http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=53

Bushell, M., Poole, B., Zegeer, C., & Rodriguez, D. (2013). Costs for Pedestrian and Bicyclist Infrastructure Improvements: A Resource for Researchers, Engineers, Planners, and the General Public. *Pedestrian and Bicycle Information Center.*

Rectangular Rapid-Flashing Beacon (RRFB)

SAFE TRANSPORTATION FOR EVERY PEDESTRIAN

COUNTERMEASURE TECH SHEET



RRFBs are pedestrian-actuated conspicuity enhancements used in combination with a pedestrian, school, or trail crossing warning sign to improve safety at uncontrolled, marked crosswalks. The device includes two rectangular-shaped yellow indications, each with an LED-array-based light source, that flash with high frequency when activated.

The RRFB is a treatment option at many types of established pedestrian crossings. Research indicates RRFBs can result in motorist yielding rates as high as 98 percent at marked crosswalks. However, yielding rates as low as 19 percent have also been noted. Compliance rates varied most per the city location, posted speed limit, crossing distance, and whether the road was one- or two-way. RRFBs are particularly effective at multilane crossings with speed limits less than 40 mph. Consider the Pedestrian Hybrid Beacon (PHB) instead for roadways with higher speeds. FHWA's *Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations* (HSA-17-072) provides specific conditions where practitioners should strongly consider the PHB instead of the RRFB.

Multiple lanes of traffic create challenges for pedestrians crossing at unsignalized locations.

RRFBs can make crosswalks and/or pedestrians more visible at a marked crosswalk.

RRFBs can reduce pedestrian crashes by

47%

FEATURES:

- Enhanced warning improves motorist yielding

OFTEN USED WITH:

- Crosswalk visibility enhancements
- Pedestrian refuge island
- Advance STOP or YIELD markings and signs

U.S. Department of Transportation
Federal Highway Administration

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Investment in roadway safety saves lives

EDC

June 2018, Updated | *FHWA-SA-18-065*

Rectangular Rapid-Flashing Beacon (RRFB)

EDC-4 STEP: https://www.fhwa.dot.gov/innovation/everydaycounts/edc_4/step.cfm

CONSIDERATIONS

FHWA has issued interim approval for the use of the RRFB (IA-21). State and local agencies must request and receive permission to use this interim approval before they can use the RRFB. IA-21 does not provide guidance or criteria based on number of lanes, speed, or traffic volumes.

RRFBs are placed on both ends of a crosswalk. If the crosswalk contains a pedestrian refuge island or other type of median, an RRFB should be placed to the right of the crosswalk and on the median (instead of the left side of the crosswalk).

RRFBs typically draw power from standalone solar panel units, but may also be wired to a traditional power source. IA-21 provides conditions for the use of accessible pedestrian features with the RRFB assembly. When RRFBs are not in common use in a community, consider conducting an outreach effort to educate the public and law enforcement officers on their purpose and use.

COST

The cost associated with RRFB installation ranges from $4,500 to $52,000 each, with the average cost estimated at $22,250. These costs include the complete system installation with labor and materials.

References

MUTCD section 2B.12 In-Street and Overhead Pedestrian Crossing Signs (R1-6, R1-6a, R1-9, and R1-9a).

Fitzpatrick, K., M. Brewer, R. Avelar, and T. Lindheimer. "Will You Stop for Me? Roadway Design and Traffic Control Device Influences on Drivers Yielding to Pedestrians in a Crosswalk with a Rectangular Rapid-Flashing Beacon." Report No. TTI-CTS-0010. Texas A&M Transportation Institute, College Station, Texas. June 2016. https://static.tti.tamu.edu/tti.tamu.edu/documents/TTI-CTS-0010.pdf

Federal Highway Administration. (2018). MUTCD – Interim Approval for Optional Use of Pedestrian-Actuated Rectangular Rapid-Flashing Beacons at Uncontrolled Marked Crosswalks (IA-21). U.S. Department of Transportation, Washington, DC.

Federal Highway Administration. (2013). "Rectangular Rapid Flash Beacon" in PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System. Available: http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=54

Bushell, M., Poole, B., Zegeer, C., & Rodriguez, D. (2013). Costs for Pedestrian and Bicyclist Infrastructure Improvements: A Resource for Researchers, Engineers, Planners, and the General Public. Pedestrian and Bicycle Information Center.

Speed Kills

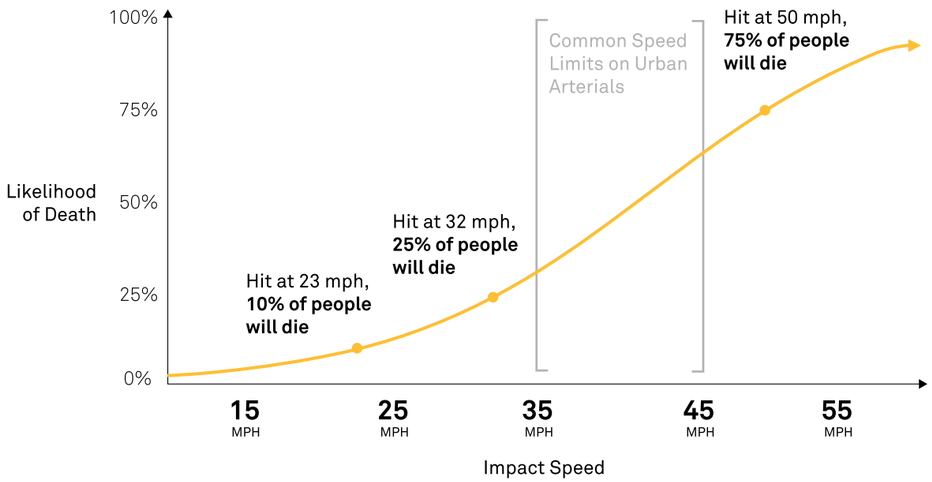
Speed is a central factor in traffic deaths. The National Highway Traffic Safety Administration reports that speed was a factor in a quarter of all fatal crashes in 2018.[19] As speed limits and speeds increase, so do fatalities. Researchers from the Insurance Institute for Highway Safety (IIHS) found that a 5 mph increase in the maximum speed limit was associated with an 8% increase in the fatality rate on interstates and freeways, and a 3% increase in fatalities on other roads.[20]

Vehicle speed at the time of impact is directly correlated to whether a person will live or die. A person hit by a car traveling at 35 miles per hour is five times more likely to die than a person hit by a car traveling at 20 miles per hour.[21] The risk of death at every speed is higher for older pedestrians and pedestrians hit by trucks and other large vehicles.[22]

High speed crashes are more likely to occur than crashes at lower speeds and, when they do occur, they're more likely to be deadly. Higher speeds are more likely to result in crashes because the amount of time a driver has to hit the brakes or swerve decreases at higher speeds, while vehicle braking distances increase.[23,24] A driver going 40 mph travels twice as far as a driver traveling at 25 mph before coming to a complete stop.[25,26,27] Research also shows that drivers have less peripheral awareness at higher speeds and are less likely to see or predict potential conflicts such as people crossing the street or children playing.[28] Meanwhile, crashes are more likely to be fatal at higher speeds because these crashes are more forceful.

As a result, evidence shows that small reductions in speed result in large safety gains.[29] The *Highway Safety Manual* reports that a 1 mph reduction in operating speeds can result in a 17% decrease in fatal crashes.[30] A separate study found that a 10% reduction in the average speed resulted in 19% fewer injury crashes, 27% fewer severe crashes, and 34% fewer fatal crashes.[31]

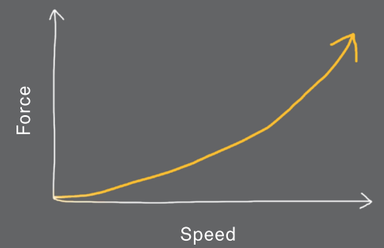
THE LIKELIHOOD OF FATALITY INCREASES EXPONENTIALLY WITH VEHICLE SPEED[32]



How Speed Kills

1

Crashes at higher speeds are more **forceful** and thus more likely to be fatal



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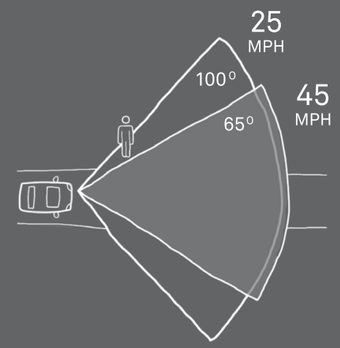
Drivers traveling at higher speeds have a **narrower field of vision**

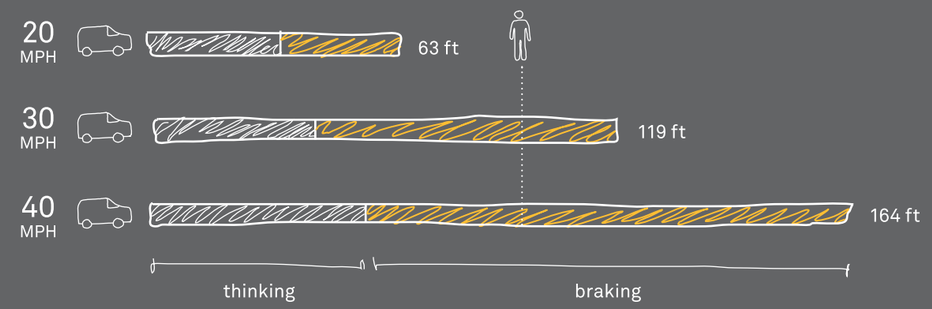


3

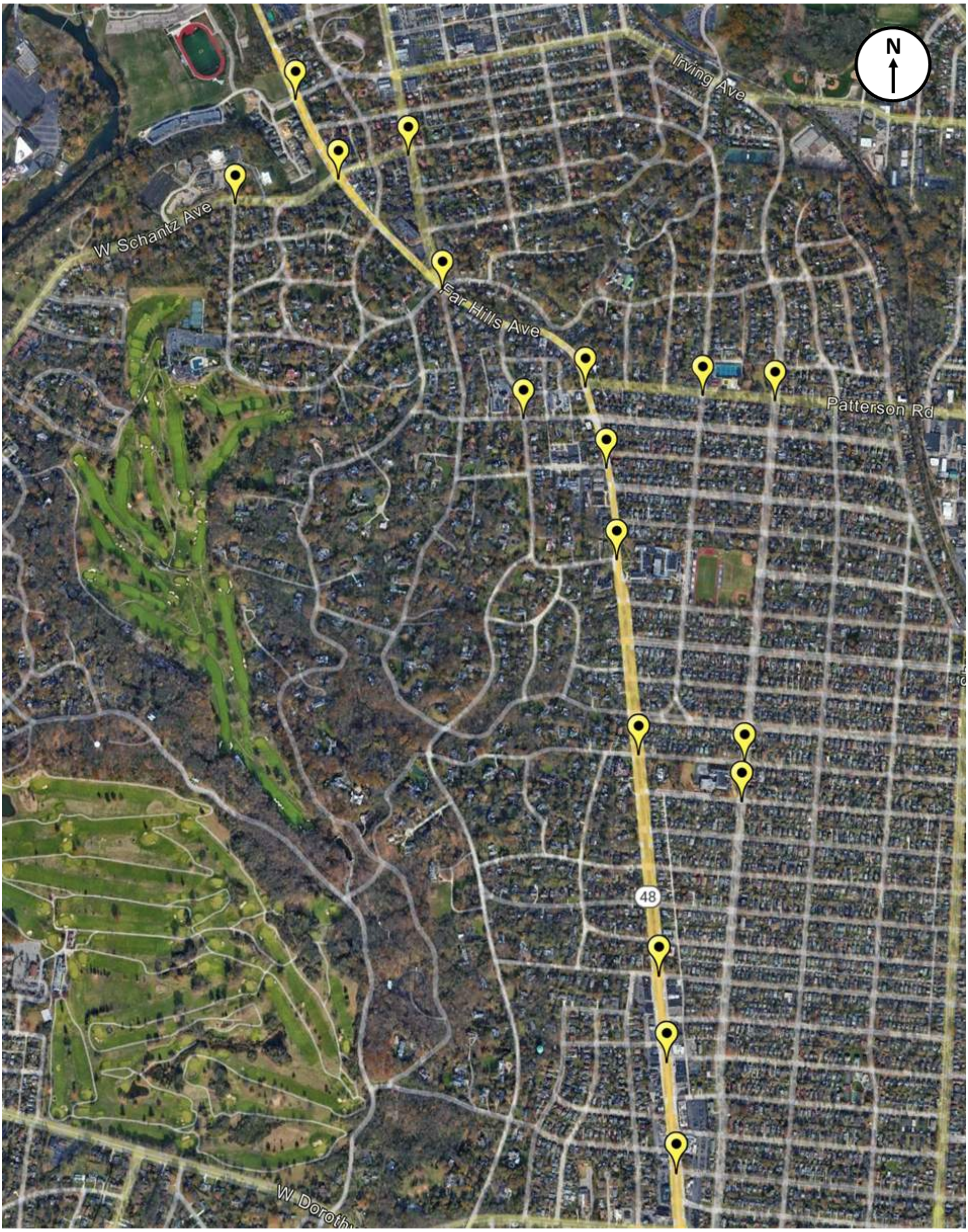
Drivers traveling at higher speeds **travel further** before they can react

4

Vehicles traveling at higher speeds have **longer braking distances**



EXISTING TRAFFIC SIGNALS



ROUNDABOUT SHAPES