
The Spectacular Seven

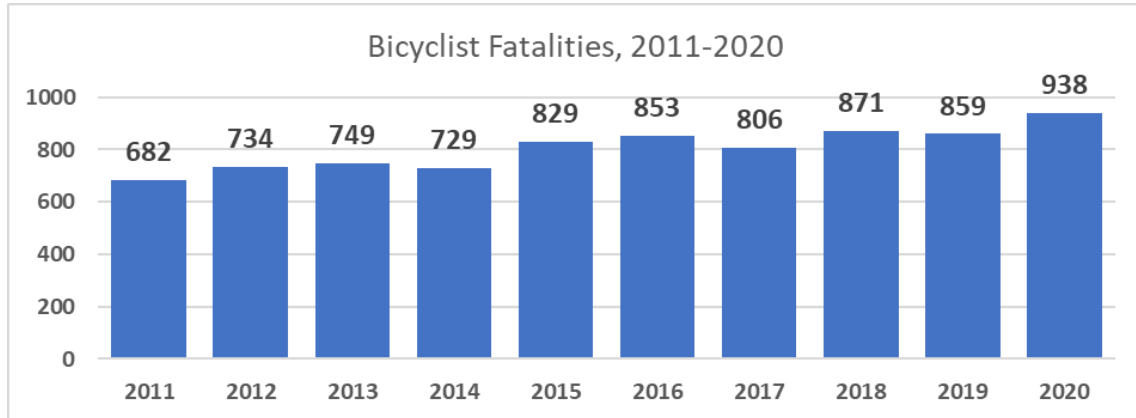
STEP

Safe Transportation for Every Pedestrian

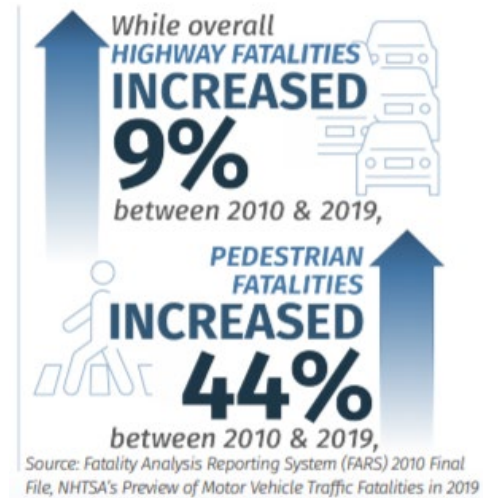
Paul LaFleur, FHWA – Office of Safety
Iowa Bicycle Summit April 6, 2023



ZERO IS OUR GOAL



Source: NHTSA's Traffic Safety Facts, DOT HS 813 322, 2020 Data



ZERO IS OUR GOAL

Why STEP?

- Over 72% of pedestrian fatalities occur at non-intersection locations
- 26% of bicycle fatalities occur at intersections
- 79% of bicycle fatalities occurred in urban areas

Safe System Approach what is it?

“Safe System is the management and design of the road system such that impact energy on the human body is **firstly avoided or secondly managed at tolerable levels** by manipulating speed, mass and crash angles to reduce crash injury severity.”

ZERO IS OUR GOAL

A SAFE SYSTEM is how we get there



SAFE SYSTEM PRINCIPLES		
<p>Death/Serious Injury is Unacceptable</p> <p>While no crashes are desirable, the Safe System approach prioritizes crashes that result in death and serious injuries, since no one should experience either when using the transportation system.</p>	<p>Humans Make Mistakes</p> <p>People will inevitably make mistakes that can lead to crashes, but the transportation system can be designed and operated to accommodate human mistakes and injury tolerances and avoid death and serious injuries.</p>	<p>Humans Are Vulnerable</p> <p>People have limits for tolerating crash forces before death and serious injury occurs; therefore, it is critical to design and operate a transportation system that is human-centric and accommodates human vulnerabilities.</p>
<p>Responsibility is Shared</p> <p>All stakeholders (transportation system users and managers, vehicle manufacturers, etc.) must ensure that crashes don't lead to fatal or serious injuries.</p>	<p>Safety is Proactive</p> <p>Proactive tools should be used to identify and mitigate latent risks in the transportation system, rather than waiting for crashes to occur and reacting afterwards.</p>	<p>Redundancy is Crucial</p> <p>Reducing risks requires that all parts of the transportation system are strengthened, so that if one part fails, the other parts still protect people.</p>

https://safety.fhwa.dot.gov/zerodeaths/zero_deaths_vision.cfm

— PEDESTRIAN FATALITY & SERIOUS INJURY RISK +

18%



50%



77%



20
MPH

30
MPH

40
MPH



CONE OF VISION

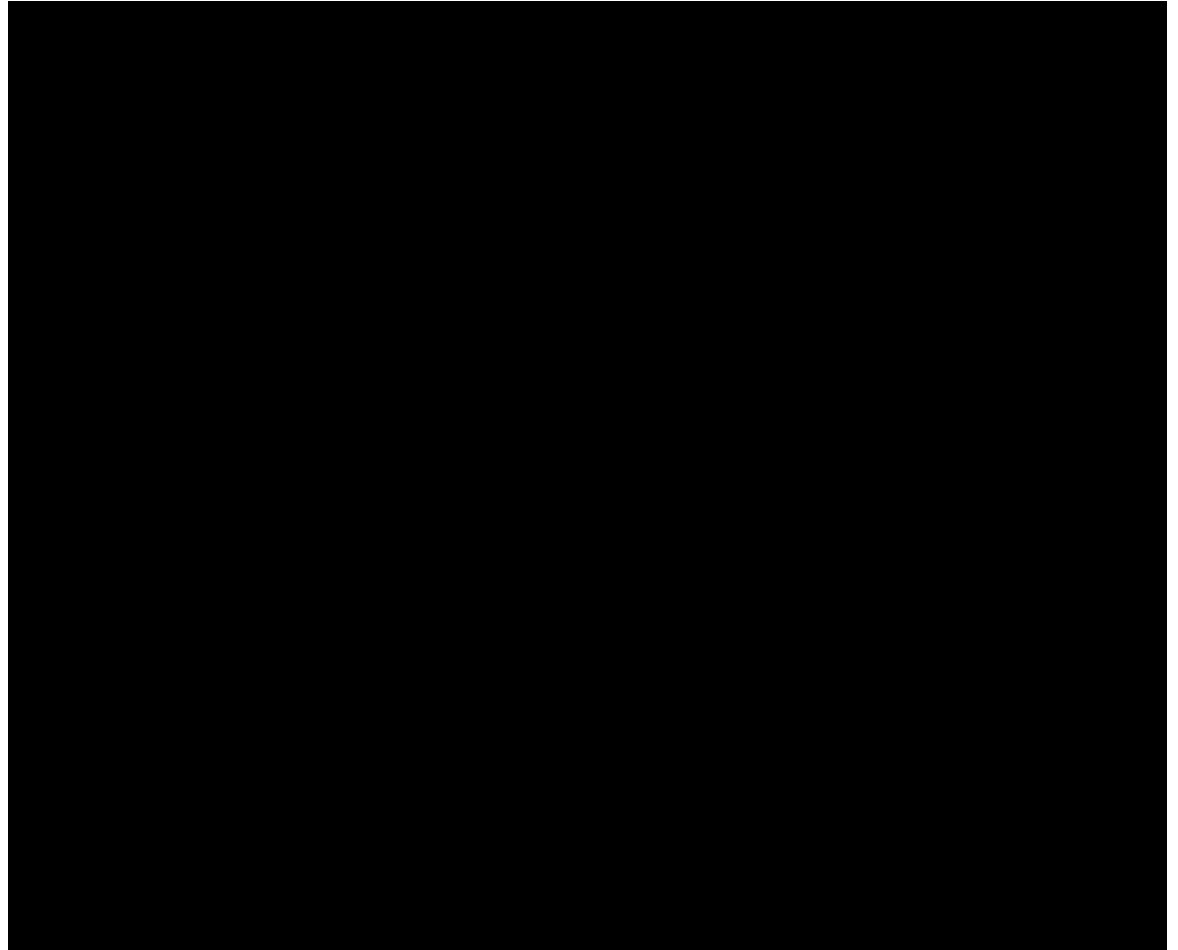
As motor vehicle speeds increase, the risk of serious injury or fatality for a pedestrian also increases (*AARP Impact Speed and a Pedestrian's Risk of Severe Injury or Death 2011, p. 1*). Also, motorist visual field and peripheral vision is reduced at higher speeds.

Australian PSA on Speed

60 kph (37 mph)

vs.

65 kph (40 mph)



Spectacular Seven



Crosswalk Visibility Enhancements



Raised Crosswalks



Pedestrian Refuge Island



Rectangular Rapid Flashing Beacon (RRFB)



Pedestrian Hybrid Beacon (PHB)



Road Diets



Leading Pedestrian Interval (LPI)

Spectacular Seven



Crosswalk Visibility Enhancements



Raised Crosswalks



Pedestrian Refuge Island



RRFB



PHB



Road Diets



LPI

Crosswalk Visibility Enhancements

SAFE TRANSPORTATION FOR EVERY PEDESTRIAN
COUNTERMEASURE TECH SHEET

This example combines curb extensions, high-visibility markings, and in-street signs on a two-lane roadway.

This example combines advance markings and signage, overhead lighting, parking restrictions, and high-visibility markings on a multilane roadway.

Poor lighting conditions, obstructions such as parked cars, and horizontal or vertical roadway curvature can reduce visibility of crosswalks, contributing to higher crash rates.

Crosswalk visibility enhancements help make crosswalks and/or pedestrians more visible and can help pedestrians decide where to cross.

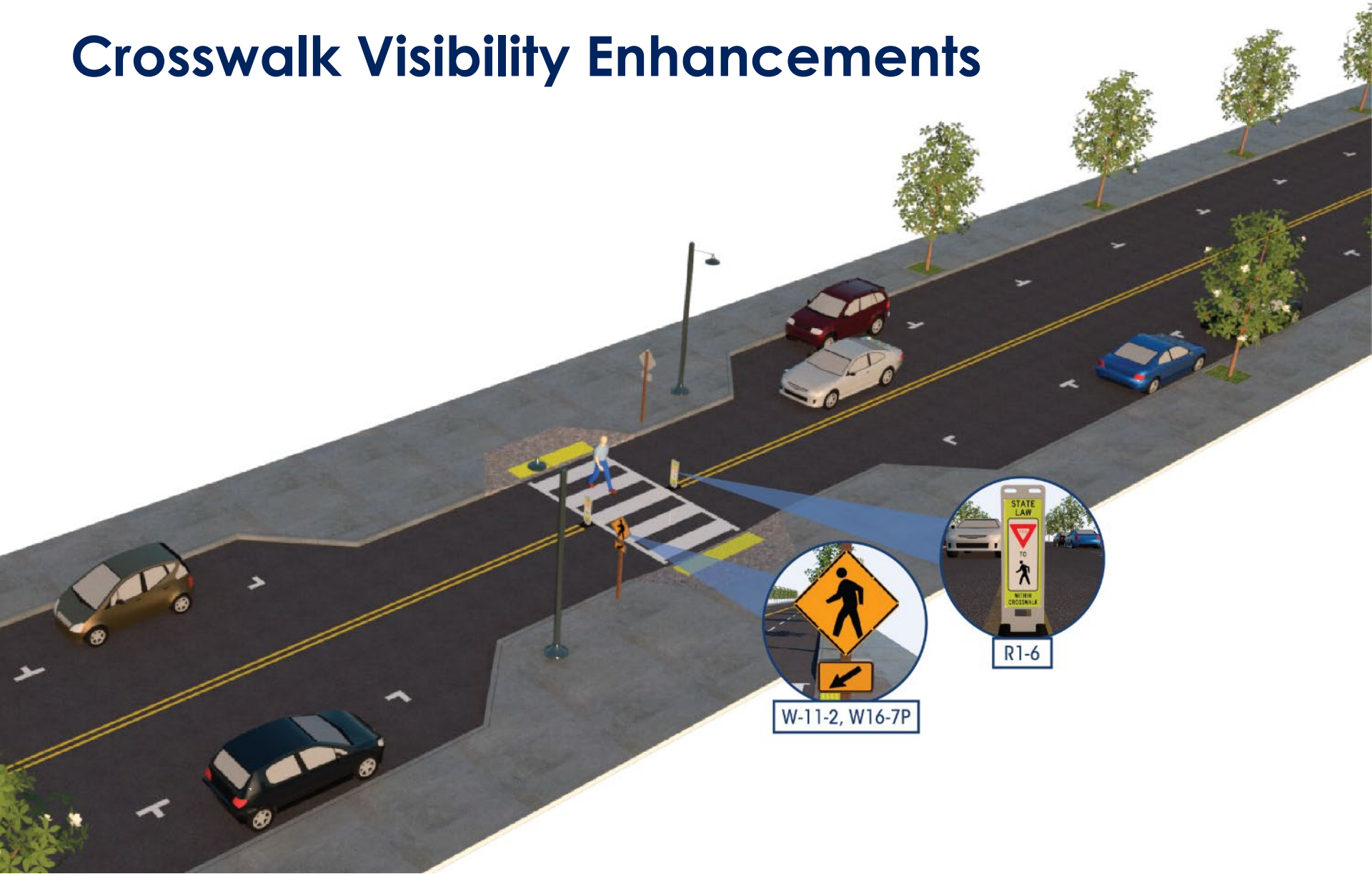
Crosswalk visibility enhancements can reduce crashes by **23–48%**

FEATURES:

- High-visibility marking improves visibility of the crosswalk compared to the standard parallel lines.
- Parking restriction on the crosswalk approach improves the sightlines for motorists and pedestrians.
- Advance STOP or YIELD markings & signs reduce the risk of a multiple-threat crash.
- Curb extension improves sight distance between drivers and pedestrians and narrows crossing distance.
- In-street STOP or YIELD signs may improve driver yielding rates.

Logos: Department of Transportation Federal Highway Administration, Safe Road for a Safe Future, EDC

Crosswalk Visibility Enhancements



Crosswalk Visibility Enhancements

High Visibility Crosswalk

What Pedestrians See

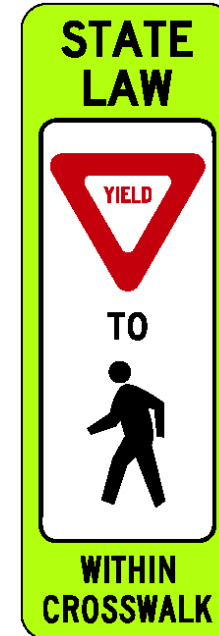


Photo Source all 4: Michael Ronkin

What Drivers See



In-street pedestrian crossing signs



R1-6



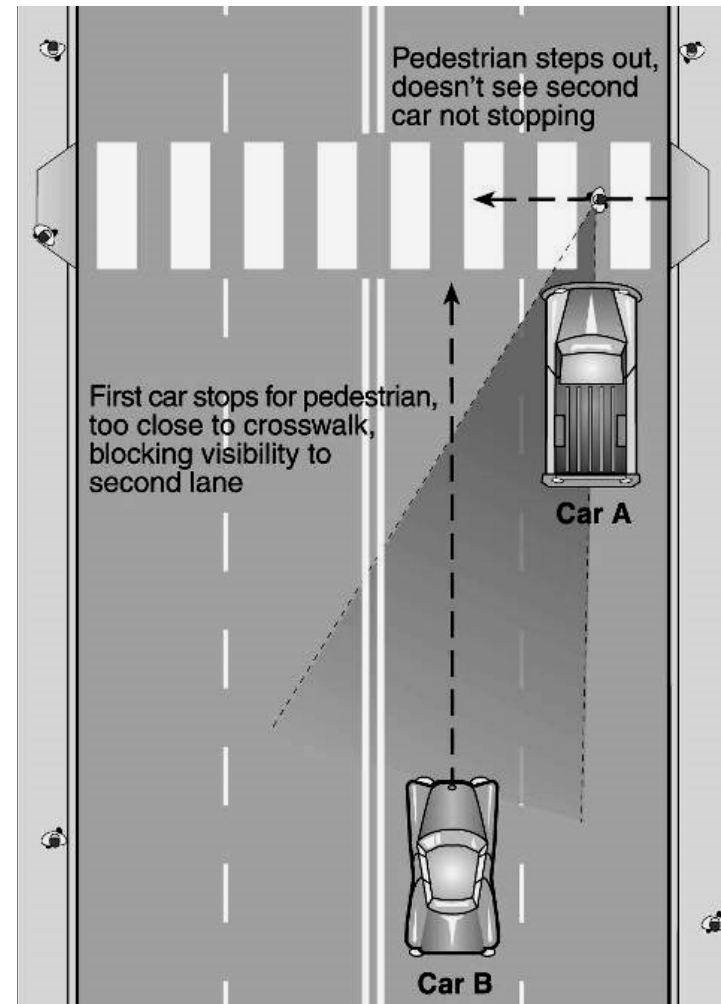
R1-6a

MUTCD signs

Yield or Stop depends
on state law

Multiple Threat Crash Problem

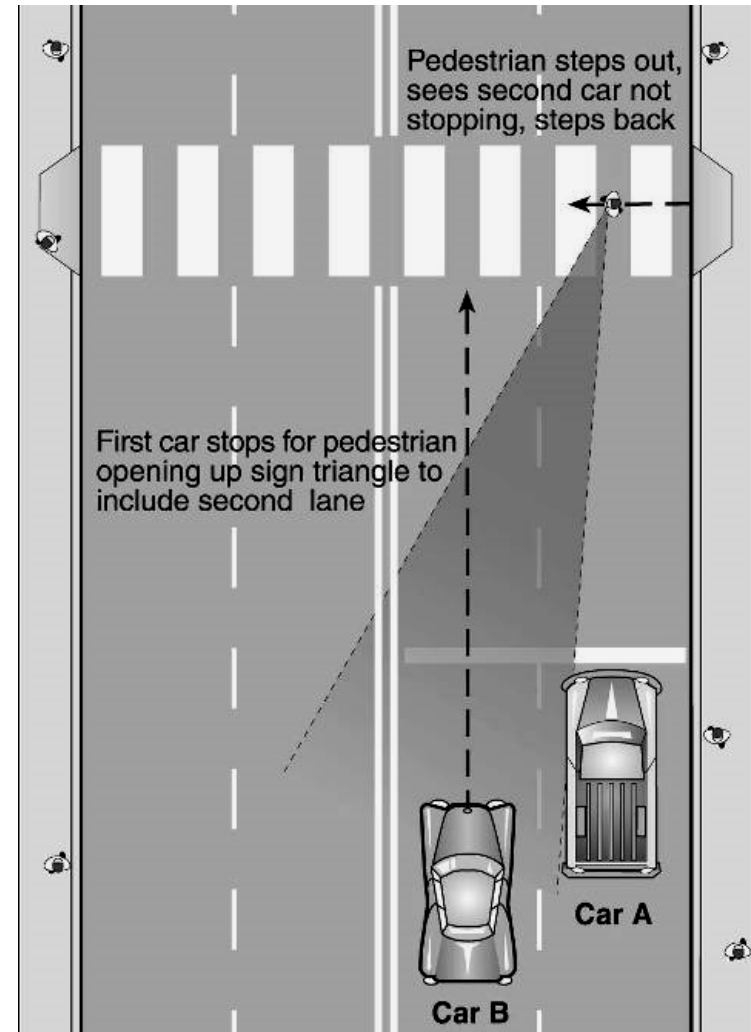
- 1st car stops to let pedestrian cross, blocking sight lines
- 2nd car doesn't stop, hits pedestrian at high speed



Multiple Threat Crash Solution

Advance stop or yield line

- 1st car stops further back, opening up sight lines
- 2nd car can be seen by pedestrian



Signing to go along with markings



R1-5

(Use where local law says yield to pedestrians)



R1-5a



R1-5b

(Use where local law says stop for pedestrians)



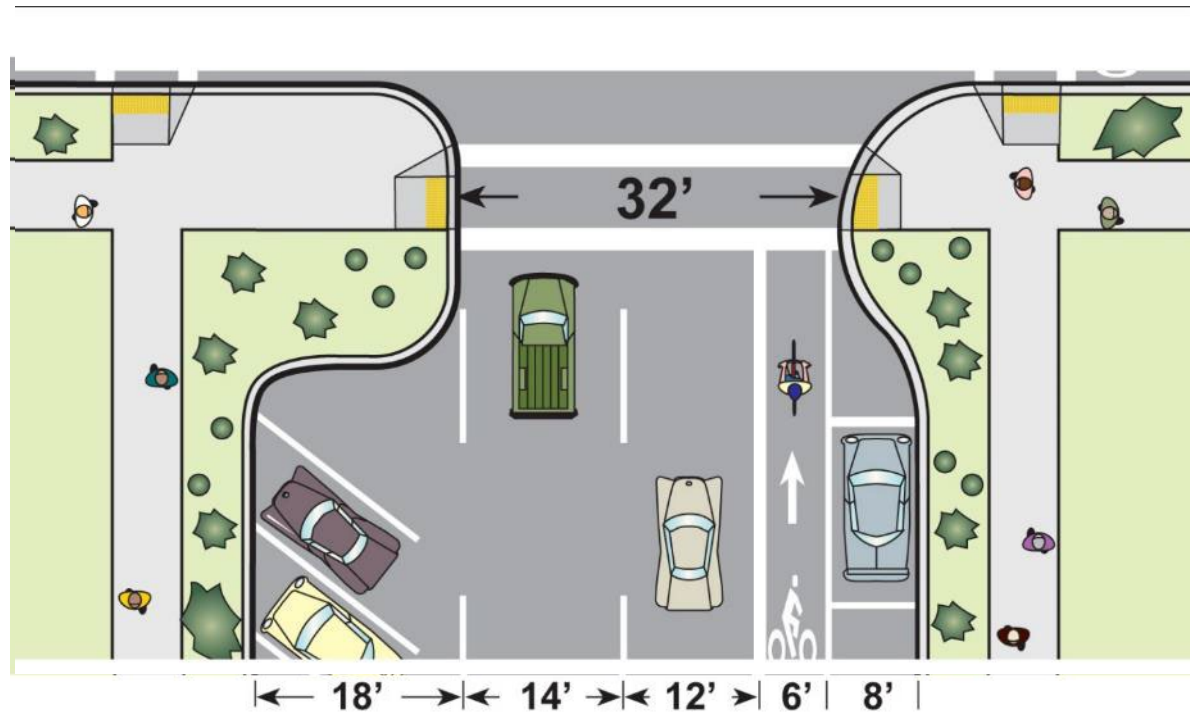
R1-5c



- Advance yield line (shark's teeth) & sign
- Consider double white lines for no passing

Curb extensions

Most focus is on reduced crossing distance

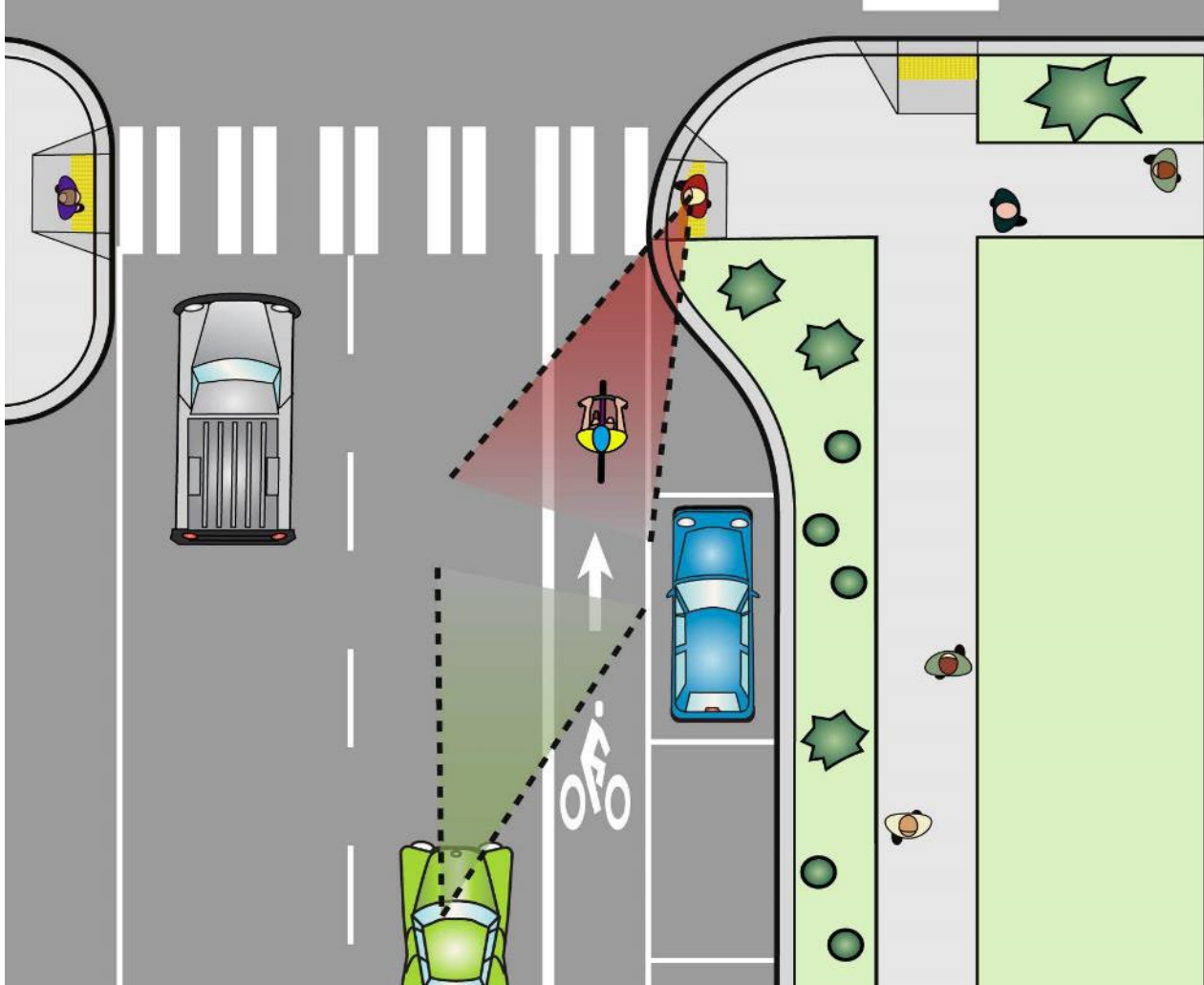


Other advantages:

- Better visibility between peds and motorists
- Traffic calming
- Room for street furniture

Curb extensions should be the width of the parking lane and not encroach on bike lanes or travel lanes

Better Visibility



Before: road looks and feels wide

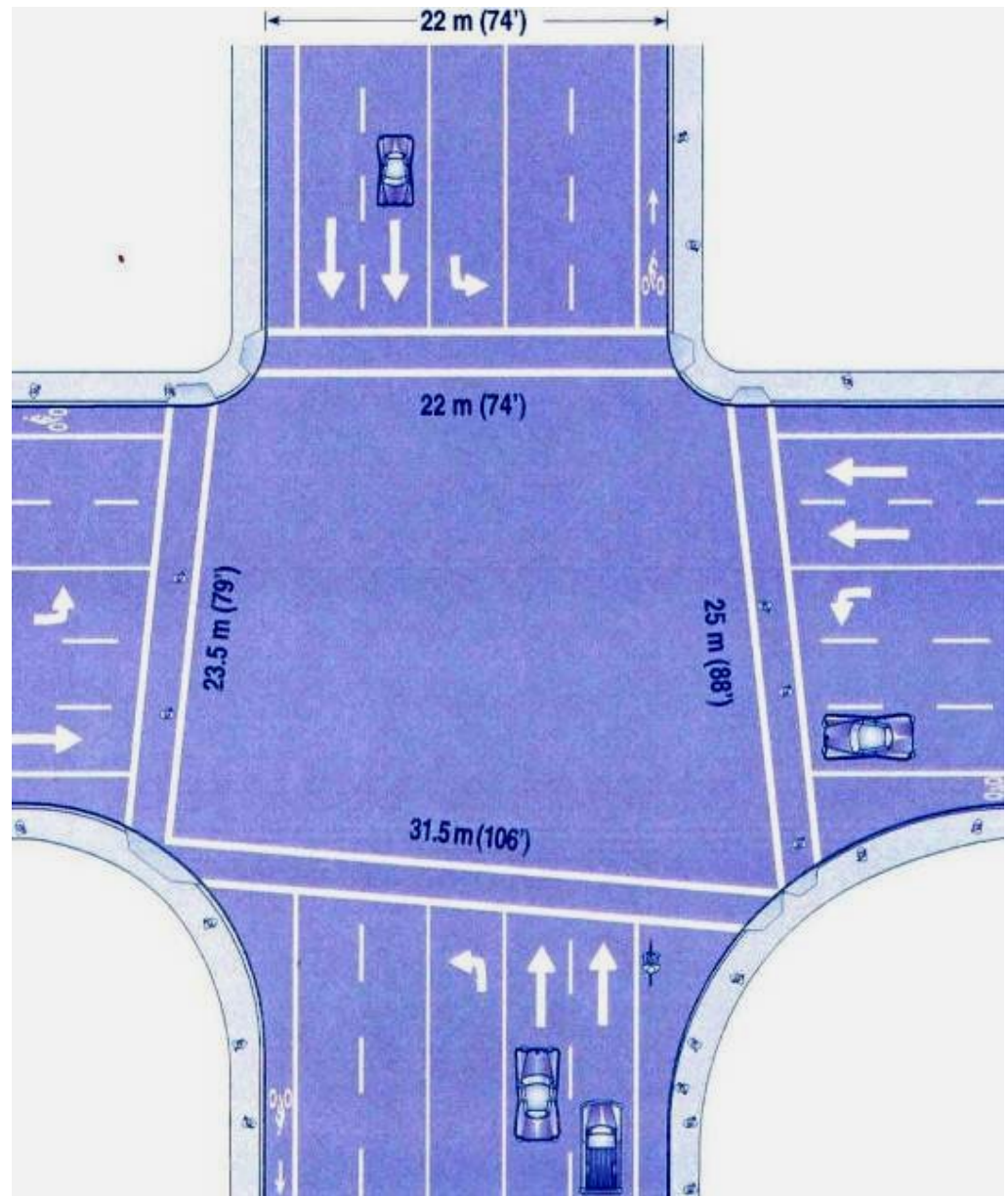


After: Mid-block curb extension and parking material matches sidewalk to make it appear narrower even with no parked cars



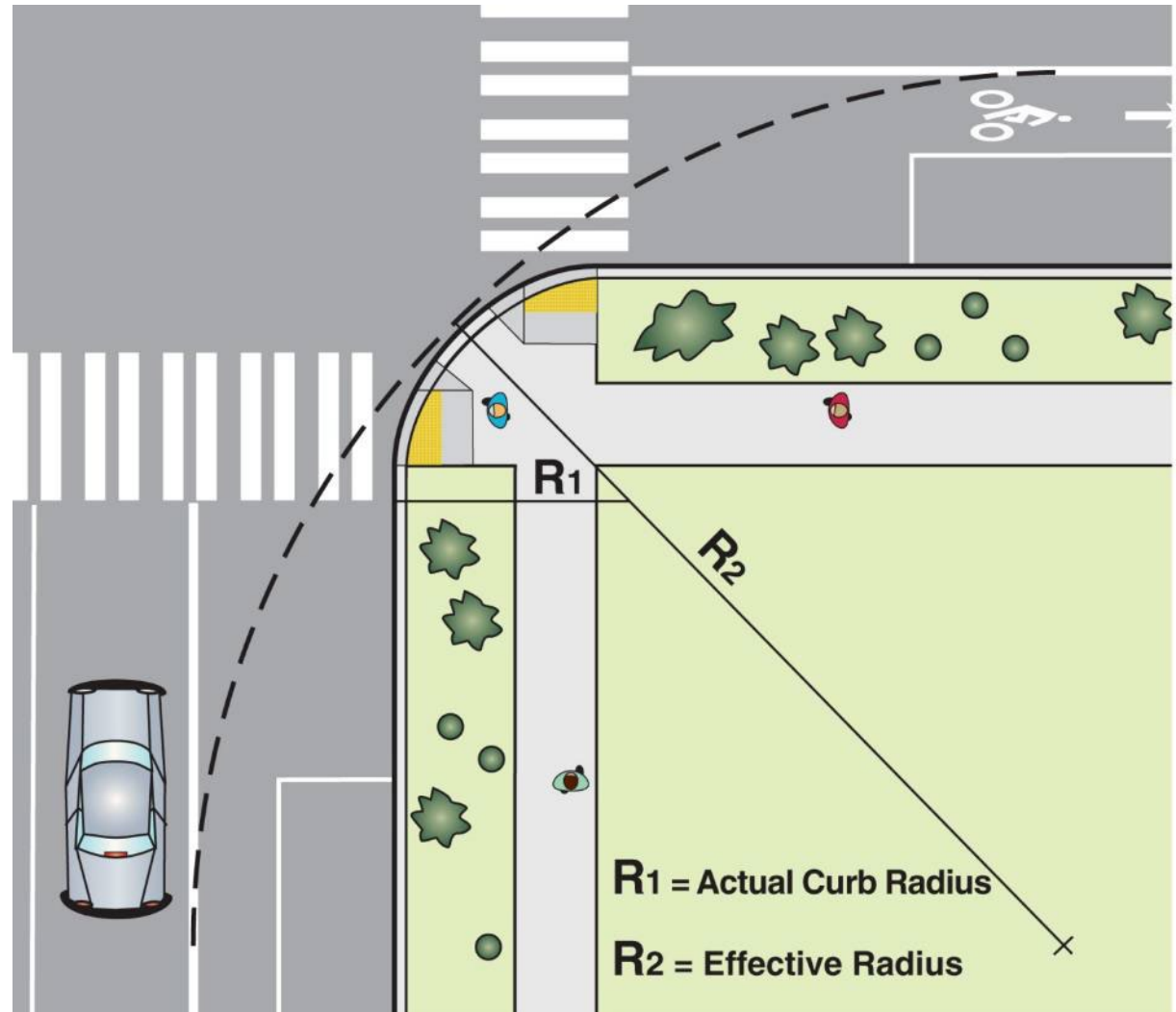
Curb radius – small radii are safer for pedestrians

Large radii:
Increases crossing
distance
Makes crosswalk
& ramp
placement more
difficult



Minimize curb radius

Calculate effective radius: Larger than built radius if travel lanes offset from curb with parking and/or bike lane



Effective Curb Radius



Minimize Curb Radius w/Truck Apron



Crosswalk Visibility Enhancements

Crosswalk Lighting



- CRF 42% to 59%
- Lighting at intersections
- 4 star rating
- Vehicle/ped crashes

Lighting Over Crosswalks

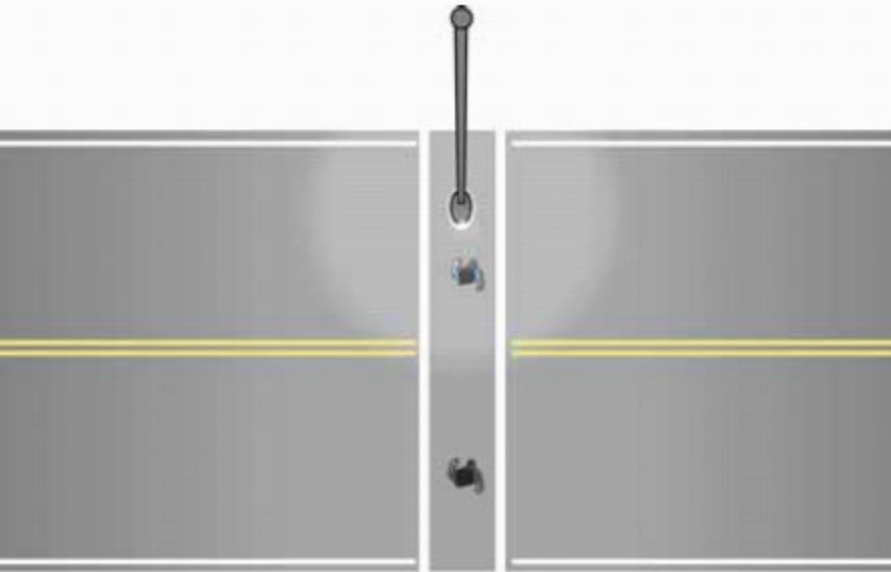


Fig 11. Traditional midblock crosswalk lighting layout

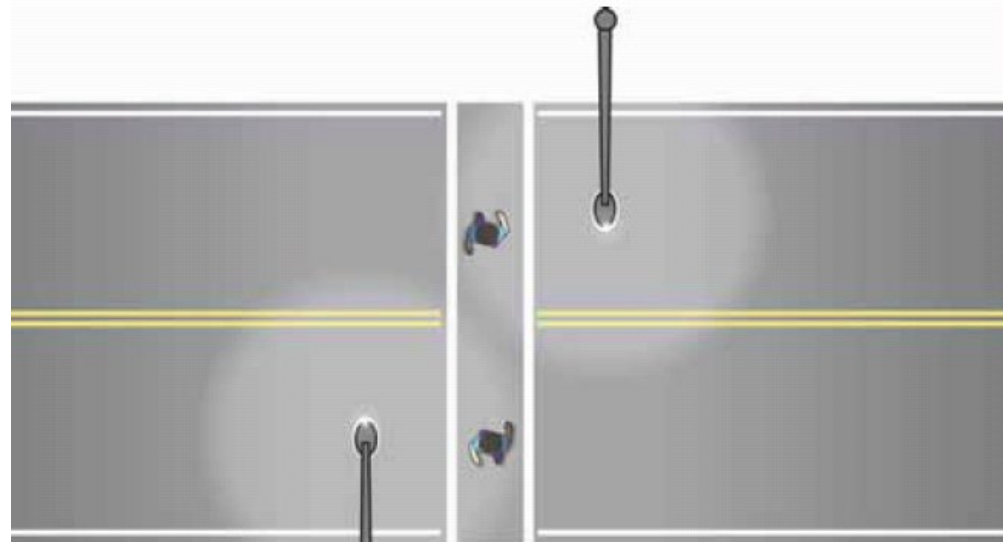
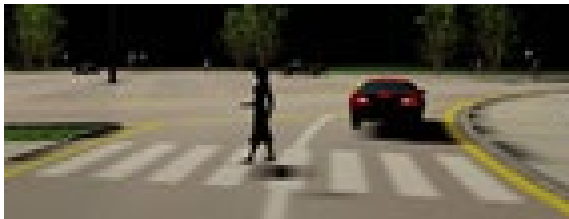


Fig 12. New design for midblock crosswalk lighting layout



Recommended lighting level: 20 lux at 5' above pavement

Spectacular Seven



Crosswalk Visibility Enhancements



Raised Crosswalks



Pedestrian Refuge Island



RRFB



PHB




Road Diets



LPI

Raised Crosswalk

SAFE TRANSPORTATION FOR EVERY PEDESTRIAN
COUNTERMEASURE TECH SHEET



Local and collector roads with high speeds pose a significant challenge for pedestrians crossing the roadway.

A raised crosswalk can reduce vehicle speeds and enhance the pedestrian crossing environment.

Raised crosswalks can reduce pedestrian crashes by **45%**

FEATURES:

- Elevated crossing makes the pedestrian more prominent in the driver's field of vision, and allows pedestrians to cross at grade with the sidewalk
- Approach ramps may reduce vehicle speeds and improve motorist yielding

OFTEN USED WITH:

- Crosswalk visibility enhancements

Department of Transportation
Federal Highway Administration

Safe Roads for a Safer Future

EDC

Raised Crosswalks

- Typically installed on 2-lane or 3-lane roads
- Speed limits of 30 mph or less
- AADT below about 9,000
- CRF: 45%



Photo Source: SRTS Guide

Raised Crosswalk

Traffic Calming ePrimer

- https://safety.fhwa.dot.gov/speedmgt/traffic_calm.cfm



Figure 3.14.6. Raised Crosswalk with Bicycle Lane
(Source: Scott Batson)



Figure 3.14.4. Raised Crosswalk at Intersection
(Source: City of Cambridge, Massachusetts)

Spectacular Seven



Crosswalk Visibility Enhancements



Raised Crosswalks



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RRFB



PHB



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LPI

Pedestrian Refuge Island

SAFE TRANSPORTATION FOR EVERY PEDESTRIAN
COUNTERMEASURE TECH SHEET



⚠️ The combination of a long crossing distance and multiple lanes of oncoming traffic can create an unsafe pedestrian environment.

💡 A pedestrian refuge island can improve safety and comfort by providing pedestrians with the option of waiting in the median area before beginning the next stage of the crossing.

Pedestrian refuge islands can reduce pedestrian crashes by **32%**

FEATURES:

- Median can enhance visibility of the crossing and reduce speed of approaching vehicles.
- Refuge area provides a place to rest and reduces the amount of time a pedestrian is in the roadway

OFTEN USED WITH:

- Crosswalk visibility enhancements
- Curb extensions (where road width allows)

A pedestrian refuge island is a median with a refuge area that is intended to help protect pedestrians who are crossing a multilane road. This countermeasure is sometimes referred to as a crossing island, refuge island, or pedestrian island. The presence of a pedestrian refuge island at a midblock location or intersection allows pedestrians to focus on one direction of traffic at a time as they cross, and gives them a place to wait for an adequate gap in oncoming traffic before finishing the second phase of a crossing.

Refuge islands are highly desirable for midblock pedestrian crossings on roads with four or more travel lanes, especially where speed limits are 35 mph or greater and/or where annual average daily traffic (AADT) is 9,000 or higher. They are also a candidate treatment option for uncontrolled pedestrian crossings on 3-lane or 2-lane roads that have high vehicle speeds or volumes. When installed at a midblock crossing, the island should be supplemented with a marked high-visibility crosswalk.

U.S. Department of Transportation
Federal Highway Administration

Safe Roads for a Safer Future

EDC

June 2018, Updated | FHWA-SA-18-062

Pedestrian Refuge Islands



R1-6



W-11-2, W16-7P



Two-stage island



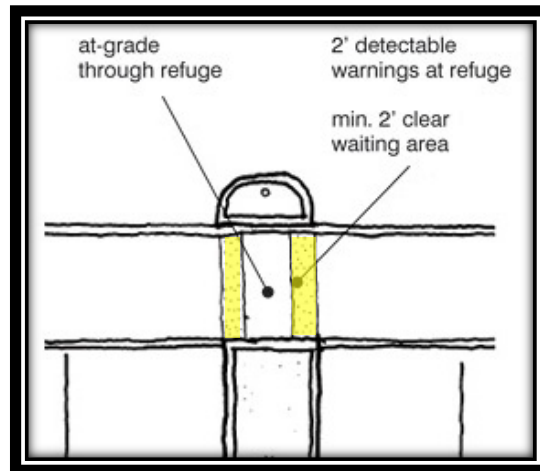
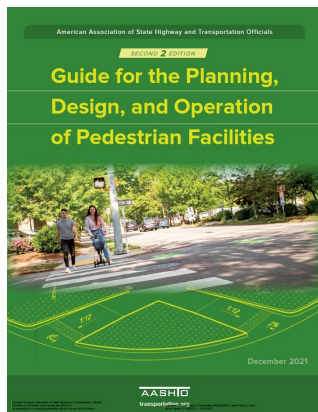
Two-Stage PHB

- Decorative fencing
- Shade in median
- Decorative landscaping – does not block visibility



2021 AASHTO 3.6.2.8 Design of Refuge Median Islands

- Minimum 6 feet wide for raised curb cut through design
 - 2 ft truncated domes 2 ft gap 2 ft truncated domes
- 10 ft recommended: accommodate bicycles, wheelchairs, scooters, and groups of pedestrians
- Length parallel to street 20 feet minimum



Spectacular Seven



Crosswalk Visibility Enhancements



Raised Crosswalks



Pedestrian Refuge Island



RRFB



PHB




Road Diets



LPI

Rectangular Rapid-Flashing Beacon (RRFB)

SAFE TRANSPORTATION FOR EVERY PEDESTRIAN
COUNTERMEASURE TECH SHEET



High speeds and 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

An RRFB is a pedestrian-actuated conspicuously enhanced crossing warning sign to improve safety at uncontrolled crossing locations. 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. For example, an RRFB may be a consideration for crossings of 2 or more lanes with speed limits of 35 mph or above and/or at crossings of 3 or more lanes with any speed limits. However, for high-speed roads (40 mph or greater) combined with high vehicle volumes (annual average daily traffic of 15,000 and above) and/or certain combinations of high-volume and high-speed, the RRFB may not be sufficient, and a Pedestrian Hybrid Beacon is likely a better option.

Department of Transportation
Federal Highway Administration

Safety for a Safer Future
www.fhwa.gov

EDC

Rectangular Rapid Flashing Beacon New IA-21

 **Memorandum**

Correction issued 3/21/2018

Subject: **INFORMATION:** MUTCD – Interim Approval for Optional Use of Pedestrian-Actuated Rectangular Rapid-Flashing Beacons at Uncontrolled Marked Crosswalks (IA-21) Date: MAR 20 2018

From: Martin C. Knopp *Martin C. Knopp*
Associate Administrator for Operations In Reply Refer To: HOTO-1

To: Federal Lands Highway Division Directors
Division Administrators



Figure 1. Example of an RRFB dark (left) and illuminated during the flash period (center and right) mounted with W11-2 sign and W16-7P plaque at an uncontrolled marked crosswalk.

https://mutcd.fhwa.dot.gov/res-interim_approvals.htm#valid09

Must request and receive permission to use this new Interim Approval (1A-21) even if prior approval had been given for Interim Approval 1A-11

A State may request Interim Approval for all jurisdictions in that State.



St. Petersburg FL

IA-21 3.a For any approach two RRFB required, One on right-hand and one on left-hand of roadway. If divided highway left-hand should be installed on median if practical rather than far left-hand.

RRFB Video IA-21 Flash Pattern



Spectacular Seven



Crosswalk Visibility Enhancements



Raised Crosswalks



Pedestrian Refuge Island



RRFB



PHB



Road Diets



LPI

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COUNTERMEASURE TECH SHEET

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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

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.

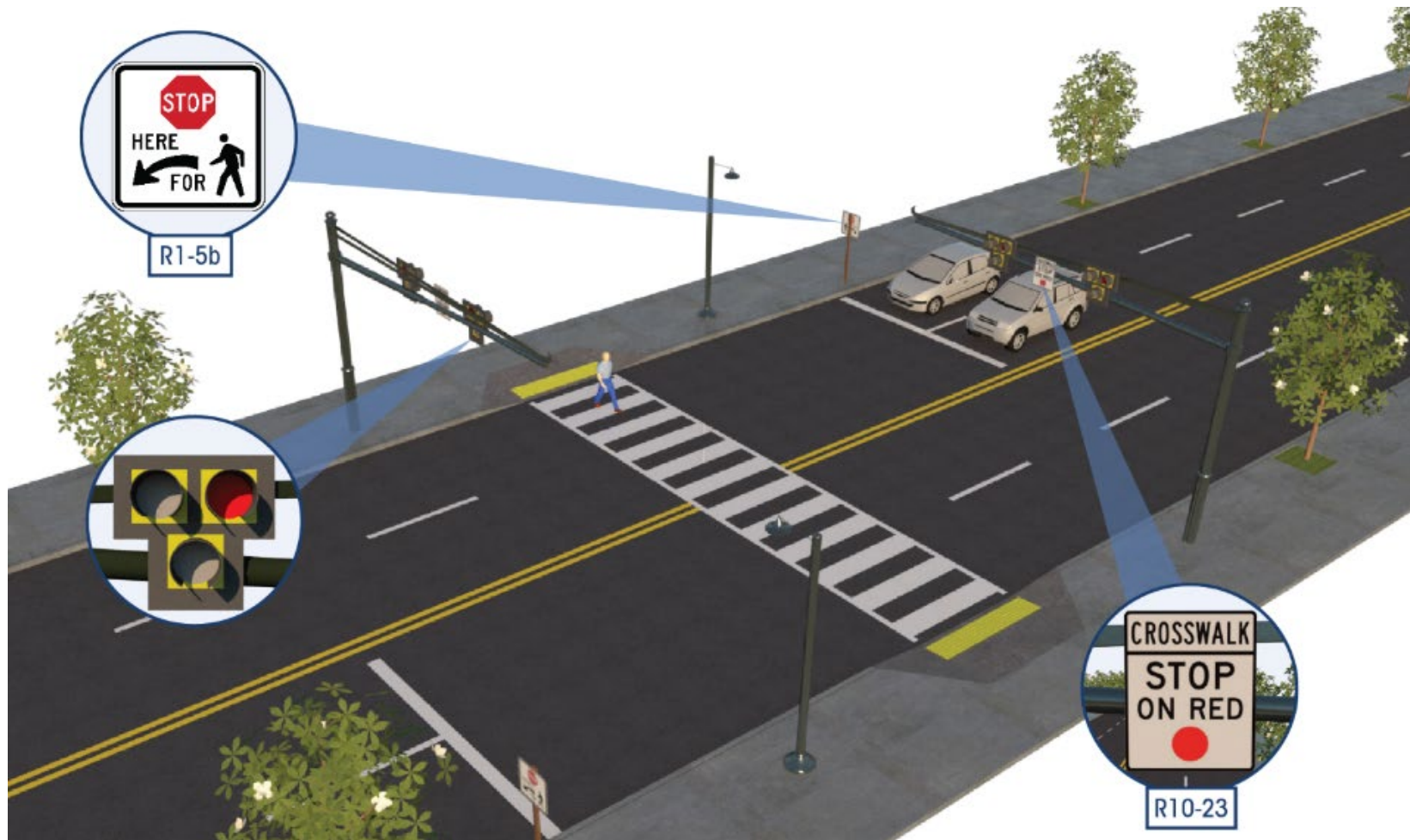
US Department of Transportation
Federal Highway Administration

Safe Roads for a Safer Future
Every Day Counts

EDC
Every Day Counts

Pedestrian Hybrid Beacon (PHB)
EDC-4 STEP: https://www.fhwa.dot.gov/innovation/everydaycounts/edc_4/step.cfm

Pedestrian Hybrid Beacons (PHB)



Pedestrian Hybrid Beacons (PHB)



CRF: Vehicle/Pedestrian 69%



1
Blank for
drivers



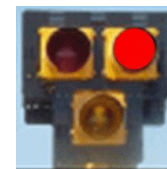
2
Flashing
yellow



3
Steady yellow



4
Steady red



5
Wig-Wag



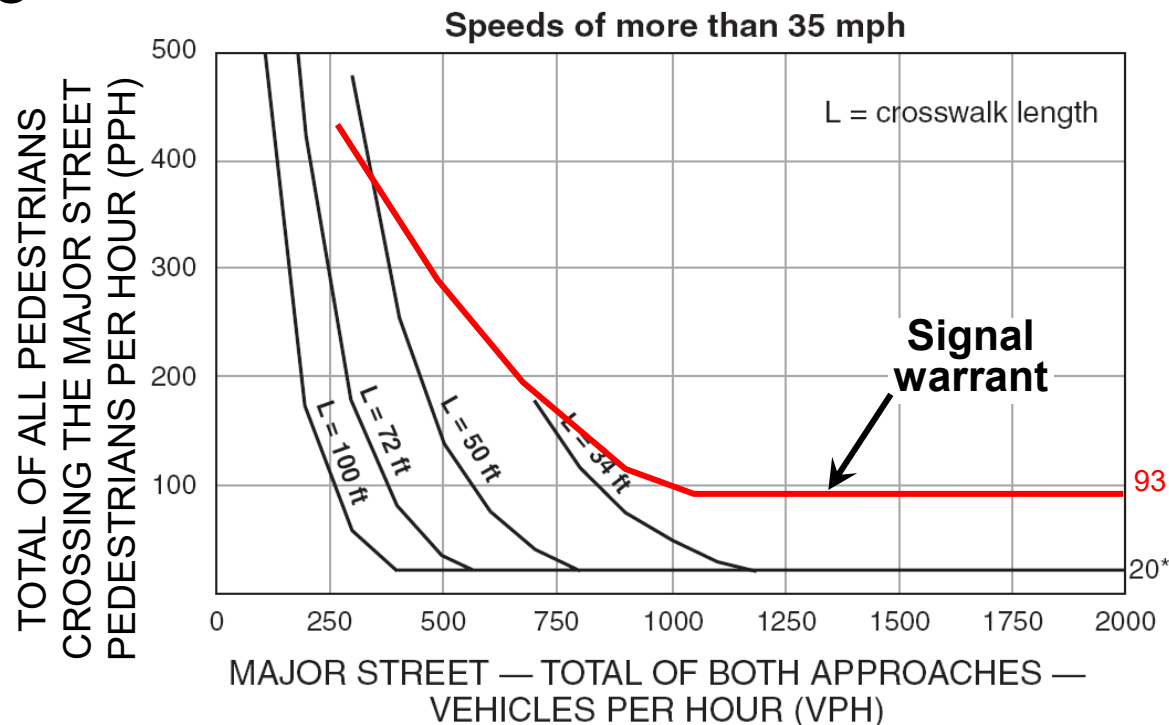
Return
to 1



Excerpts from 2009 MUTCD Chapter 4F For Pedestrian Hybrid Beacons

The CROSSWALK STOP ON RED sign shall be used
There are **Guidelines** (similar to signal warrants) for Pedestrian Hybrid Beacons – variables include:

- Pedestrian volume
- Traffic speeds
- Traffic volumes
- Crosswalk length



2009 MUTCD mandated sign

Standard:

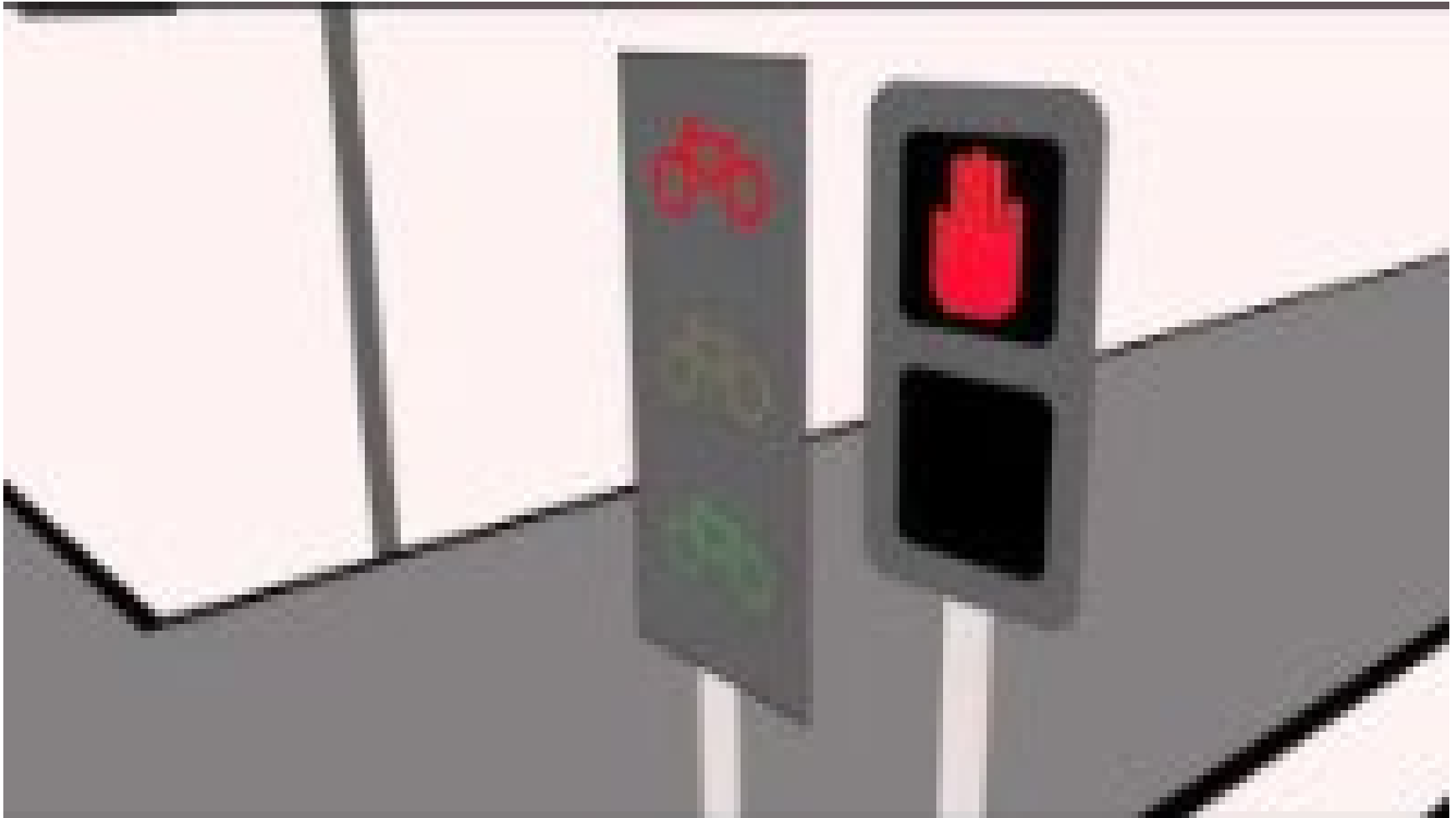
A CROSSWALK STOP ON RED (symbolic circular red) (R10-23) sign shall be mounted adjacent to a PHB face on each major street approach.

Option:

- State MUTCD's may allow other appropriate MUTCD approved ped, bike or school crossing signs



PHB and Bike Signal videos



Spectacular Seven



Crosswalk Visibility Enhancements



Raised Crosswalks



Pedestrian Refuge Island



RRFB



PHB



Road Diets



LPI

Road Diet

SAFE TRANSPORTATION FOR EVERY PEDESTRIAN
COUNTERMEASURE TECH SHEET

Multilane roads can take longer to cross and vehicle speeds may be high.

Road Diets can decrease the lane crossing distance and reduce vehicle speeds.

Road Diets can reduce total crashes by **19-47%***

*19% in urban areas, 47% in suburban areas.

FEATURES:

- Reduced crossing distance and exposure.
- Reduced vehicle speeds.
- Promote Complete Streets.
- Provide space for installing curb extensions and widening sidewalks.
- Create space for bicycle, transit, and/or parking lanes.

EDC

Road Diet:

Before



After



Road Diet / Roadway Reconfiguration



- Reduce crossing distance
- Eliminate /reduce “multiple threat” crash types
- Install crossing island to cross in 2 simple steps

Road Diet / Roadway Reconfiguration



- Reduce top end travel speeds
- Buffer sidewalk from travel lanes (parking or bike lane)
- Reclaim street space for “higher and better use” than moving peak hour traffic

General Guidelines for Traffic Volumes

**LESS THAN
10,000 ADT**

**Great
candidate
for Road
Diet**

In most instances traffic will likely not be negatively affected.

**10,000 –
15,000 ADT**

**Very good
candidate
for Road
Diet**

Agencies should conduct intersection analysis to study potential traffic operational effects and consider signal retiming as needed.

**15,000 –
20,000 ADT**

**Good
candidate
for Road
Diet**

Agencies should conduct a corridor analysis since traffic operations may be affected at this volume depending on the “before” condition.

**GREATER THAN
20,000 ADT**

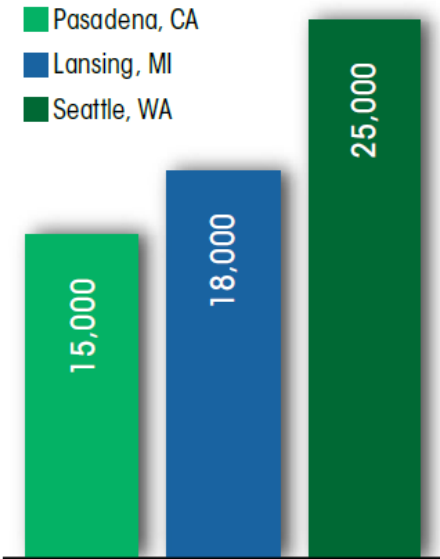
**Potential
candidate
for Road
Diet**

Agencies should complete a feasibility study to determine whether this is a good location for a Road Diet. Operations may be affected at this volume.

There are examples across the country where Road Diets have been successful with ADTs as high as 26,000



Road Diets

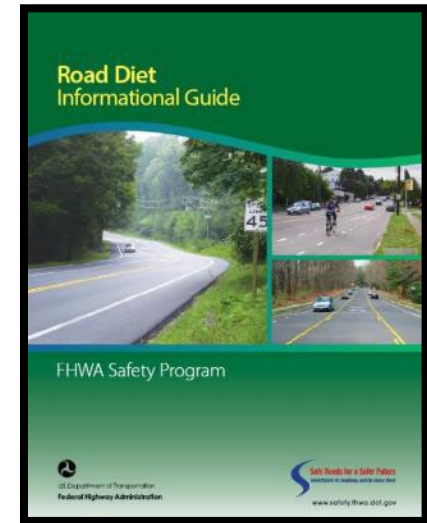


Maximum Volume for Road Diet (ADT)

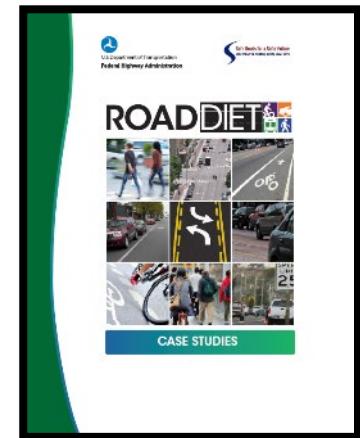
Figure 12. Road Diet Implementation Maximum Volume Thresholds by Agency

Considerations

- Safety
- Operations
 - Peak Hour
- Design
 - Signalized Intersection Adjustments
- Resurfacing
- Context Sensitive Solutions/Complete Streets



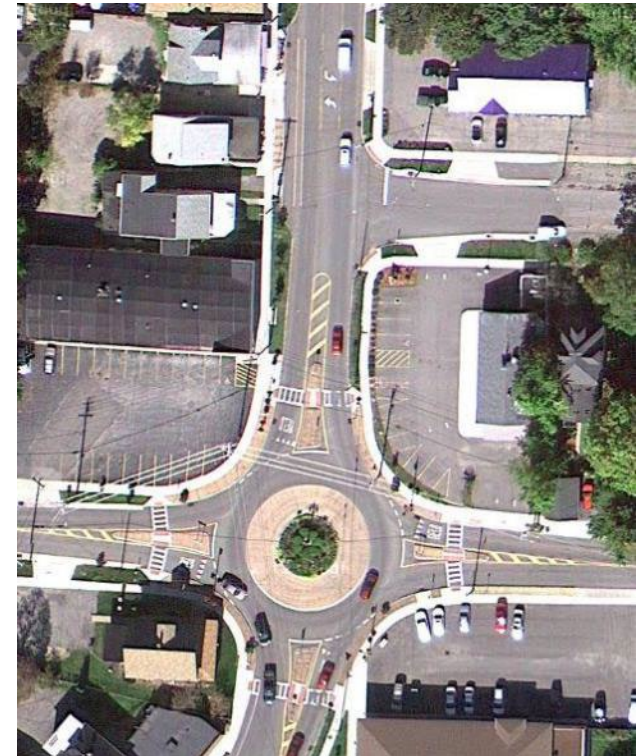
https://safety.fhwa.dot.gov/road_diets/guidance/info_guide/



https://safety.fhwa.dot.gov/road_diets/case_studies/

Intersections

- Signal timing or phasing changes at intersections to optimize operations and safety benefits
- Roundabouts Single Lane
 - ~ 20,000 ADT



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US Department of Transportation
Federal Highway Administration

Safe Road for a Safer Ride
National Highway Traffic Safety Administration

EDC
Economic Development Corporation

Leading Pedestrian Interval

3+ second head start to enter the crosswalk



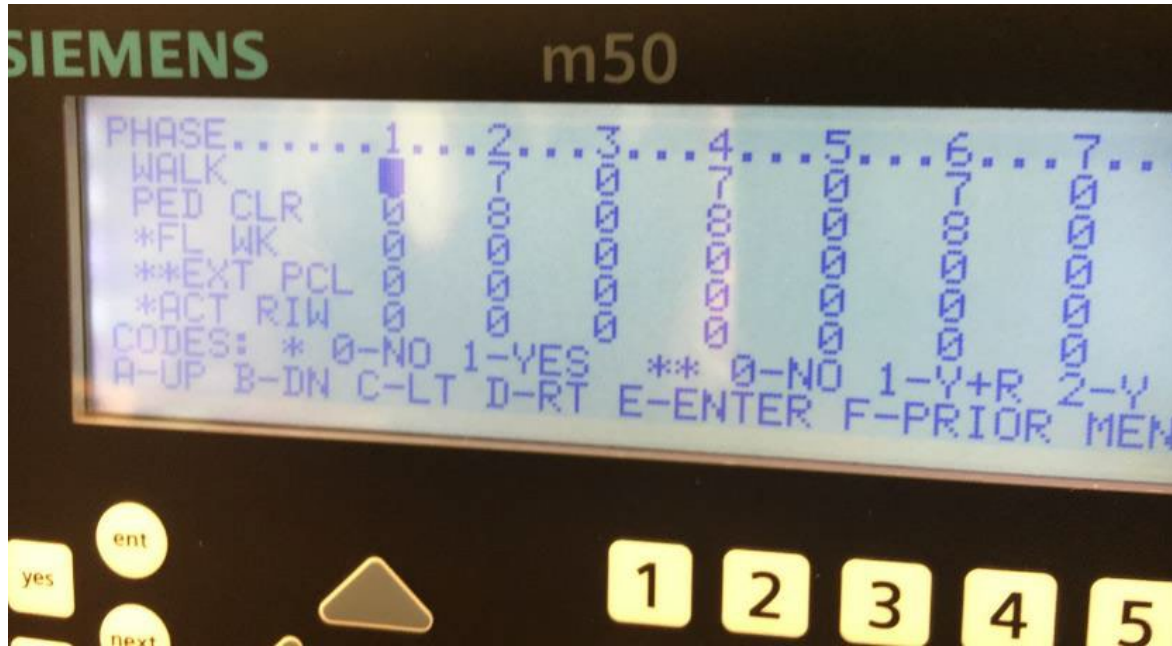
Source: FHWA

LPI Suitability

- Often used at intersections where drivers make turns with a need to yield to oncoming traffic
- Address visibility concerns
- Accommodate high ped volume and crashes
- Proximity to vulnerable populations

Implementation Considerations

Hardware



Controller Requirements

- NEMA TS2 Type 1 or 2
- 2070 or 270

Vision Impairment and APS

- Without APS, pedestrians with vision impairments cross by listening to vehicle movement
- APS important when either LPI or exclusive ped phase used



Spectacular Seven



Crosswalk Visibility Enhancements



Raised Crosswalks



Pedestrian Refuge Island



Rectangular Rapid Flashing Beacon (RRFB)



Pedestrian Hybrid Beacon (PHB)



Road Diets



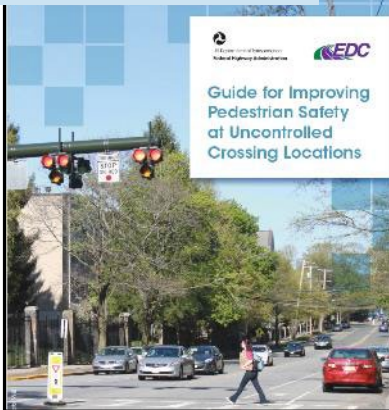
Leading Pedestrian Interval (LPI)

STEP Resources

https://safety.fhwa.dot.gov/ped_bike/step/resources/



Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations



Pedestrian Hybrid Beacon (PHB)

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Publicly-Supported Road Diet Reduces Speeds in Alexandria

SAFE TRANSPORTATION FOR EVERY PEDESTRIAN CASE STUDY

Alexandria Department of Transportation

Primer for Pedestrian Safety STEM Activities

STEM Lessons for Pedestrian Safety: Primer

The streets and transportation network are intended for members of the community of all ages, abilities, and social backgrounds. Everyone should be able to make it to their destination safely as they go about their daily lives. There are many practical ways to improve streets and transportation to keep people safe and comfortable whether on foot, bike, using a mobility device, or in a motorized vehicle. Whether pedestrian safety is already an integral part of your work or the topic is somewhat new to you, conducting these activities is a great chance to introduce transportation design and road safety to young people. It's also a chance to let them know why this work is important and what roles they can play in the future. Thank you for teaching the next generation.

Intended Use: This set of five lessons is generally relevant for students in grades 4 through 8. The lessons can be taught during the school day or as part of an extracurricular activity. The time needed for the lessons ranges from 30 minutes to two hours. The lessons are intended to be taught by someone with experience in the transportation field or a related field. Key concepts are described in an accessible manner so that anyone can use the materials. Instructors with a passion for learning new topics are also encouraged to familiarize themselves with the why and how of these concepts.

The Why and How Behind the Concepts

- Improving the ability of all road users to see each other. It's key for the people who are not in vehicles to see and be seen so that they do not put themselves in jeopardy around moving vehicles. Being able to see properly, gives drivers enough time to stop.
- Shortening the distance for people to cross the street. Shorter distances take less time to traverse so people experience less risk. Crosswalks, crosswalks, and people with disabilities may take more time when crossing so this is especially important for them.
- Making crossing the street safer for people with a range of abilities. Street crossings for people walking are improved by adding features like pedestrian refuge islands, curb extensions, narrower lanes, lighting, audible signals, clearer pavement markings, and more.
- Reducing driver speed. Higher speed traffic results in more severe injuries. People outside vehicles are disproportionately injured over those protected inside the vehicle. At high speeds, drivers require more time (and distance) to slow down and react to what's in front of them. Adding street designs that lead to even a small speed reduction can result in less severe crashes.
- Using design to increase the chance that a driver acts safely around other road users. Features that change the road landscape like pedestrian refuge islands, curb extensions, and rectangular rapid-flashing beacons can improve the visibility of a crossing to drivers. Width of travel lanes, number of lanes, traffic signal timing, and roadside design can all send subconscious cues to drivers about appropriate travel speed around other road users.
- Creating space for people to walk, bicycle, take the bus, or park their car safely. The design of streets and public space should generally be such that it limits the maximum speed at which drivers can operate comfortably while also ensuring that there is plenty of space designed for the mobility safety needs of other road users. Trails/pathways can also be used to create separate spaces and offer more direct routes for people walking and bicycling.

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Safe Transportation for Every Pedestrian (STEP) – Videos

The FHWA Safe Transportation for Every Pedestrian (STEP) program developed a series of videos to promote countermeasures that reduce crash risk for pedestrians crossing roadways. These brief videos explain the safety benefits of five countermeasures including crosswalk visibility enhancements, refuge islands, raised crosswalks, Pedestrian Hybrid Beacons, and Road Diets. Each video highlights local transportation officials where the countermeasures have been implemented, and the videos show how pedestrians and drivers use or interact at the crossing improvements. These videos can be used in public meetings or shared through social media to help educate pedestrians, drivers, and local decision-makers.

SS4A Grants



Resources

- STEP

- https://safety.fhwa.dot.gov/ped_bike/step/resources/

- FHWA Pedestrian Safety

- https://safety.fhwa.dot.gov/ped_bike/

- Pedestrian Bicycle Information Center

- <http://www.pedbikeinfo.org/>

- NHTSA Bicycle Safety

- <https://www.nhtsa.gov/road-safety/bicycle-safety>

- US DOT Walking and Bicycling

- <https://www.transportation.gov/pedestrian-bicycle-safety>

Resources

PEDSAFE <http://www.pedbikesafe.org/PEDSAFE/index.cfm>

Links in PEDSAFE to specific countermeasures

- Marked Crosswalks and Enhancements
 - http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=4
- Lighting and Illumination
 - http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=8
- Crossing Islands
 - http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=6
- Raised Pedestrian Crossings/ Raised Crosswalks
 - http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=7
- Raised Medians
 - http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=22
- RRFB
 - http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=54
- Pedestrian Hybrid Beacon
 - http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=53
- Road Diets (Lane Reduction)
 - http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=19
- Leading Pedestrian Interval (LPI)
 - http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=12



Questions

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