



U.S. Department of Transportation  
Federal Highway Administration



# Pedestrian Proven Safety Countermeasures September 22, 2022

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Source: Fotosearch

**ZERO** IS OUR GOAL  
A SAFE SYSTEM IS HOW WE GET THERE





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# History of the Proven Safety Countermeasures

- Launched in 2008
- Updated in 2012, 2017 and 2021
- 28 countermeasures
  - 8 Pedestrian infrastructure
- Selection Criteria
  - Proven effective
  - Not widespread deployment



Source: FHWA

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## Existing Pedestrian PSCs

## New Pedestrian PSCs

2017



Leading Pedestrian Interval



Pedestrian Hybrid Beacons



Road Diets  
(Roadway Reconfiguration)



Medians and Pedestrian Refuge  
Islands in Urban and Suburban Areas



2008

Walkways



Rectangular Rapid Flashing  
Beacons (RRFBs)



Lighting (Intersection and Segments)



Crosswalk Visibility Enhancements

<https://safety.fhwa.dot.gov/provencountermeasures/>



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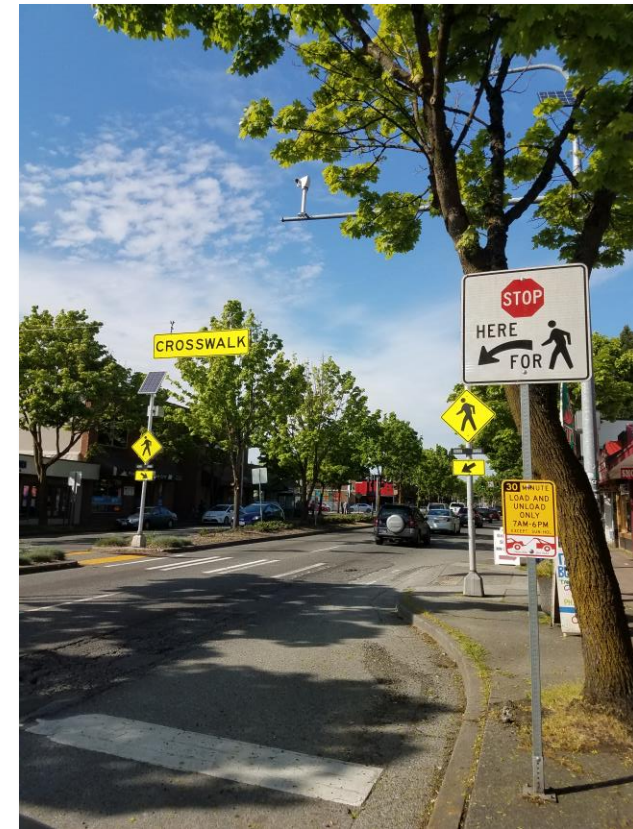
# Rectangular Rapid Flashing Beacons (RRFBs)





# Rectangular Rapid Flashing Beacons (RRFBs)

- Pedestrian-actuated conspicuity enhancement
- Supplements Pedestrian, School, or Trail Crossing post-mounted warning signs
- Solar-powered or hard wired



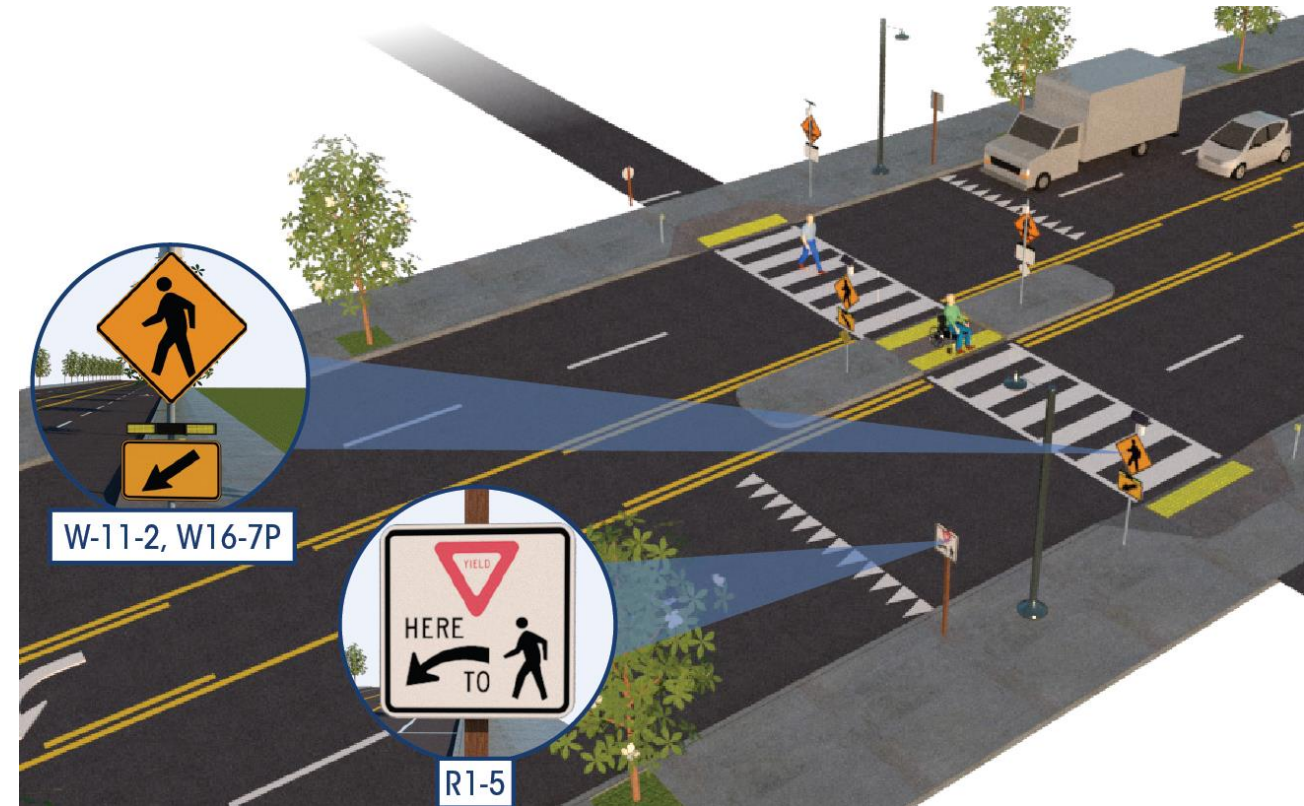
Source: Toole Design Group





# Rectangular Rapid Flashing Beacons (RRFBs)

- Used at uncontrolled, marked crosswalks
- Effectiveness
  - 47% reduction in pedestrian crashes
  - Up to 98% motorist yielding rate





# Rectangular Rapid Flashing Beacons (RRFBs)

- For any approach, two RRFBs are required, one on left-side and one on right-side of roadway
  - If used on divided highway, should be installed on left-side of median if practical, rather than far left-side of roadway
- Flash period initiated each and every time a pedestrian is detected



Source: Peter Eun



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# Lighting



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# Lighting (Intersections and Segments)

- **Nighttime fatality rate is three times the daytime rate**
- **Lighting:**
  - Significantly improves visibility of the roadway
  - Increases sight distance
  - Makes roadside obstacles more noticeable/avoidable
- **Modern lighting gives precise control to reduce excessive light**
  - Affecting the nighttime sky
  - Spilling over to adjacent properties
- **Lighting can provide personal security for pedestrians, wheelchair and other mobility devices, bicyclists, and transit users**

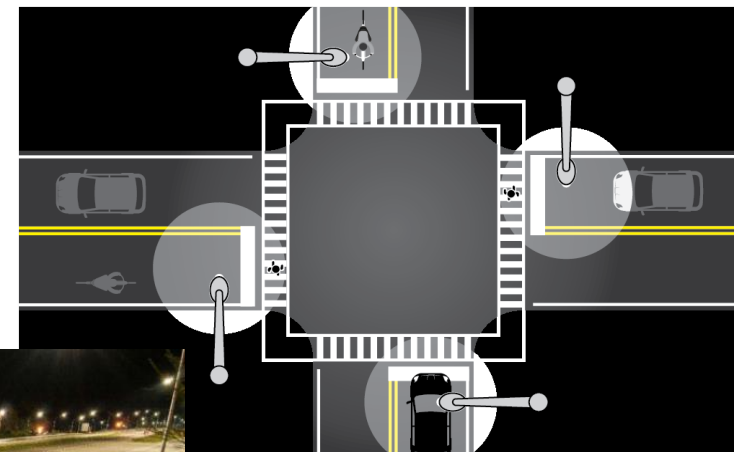


Source: WSDOT (top) and FHWA (bottom)



# Lighting (Intersections and Segments)

- **Intersections – Urban, suburban, and rural signalized and unsignalized**
  - Effectiveness
    - 42% reduction in nighttime injury pedestrian crashes at intersections
    - 38% reduction in nighttime intersection crashes
- **Segments – Rural and Urban highways**
  - Effectiveness
    - 28% reduction in nighttime injury crashes on urban highways



Source: FHWA



Source: WSDOT



Source: FHWA



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# Crosswalk Visibility Enhancements



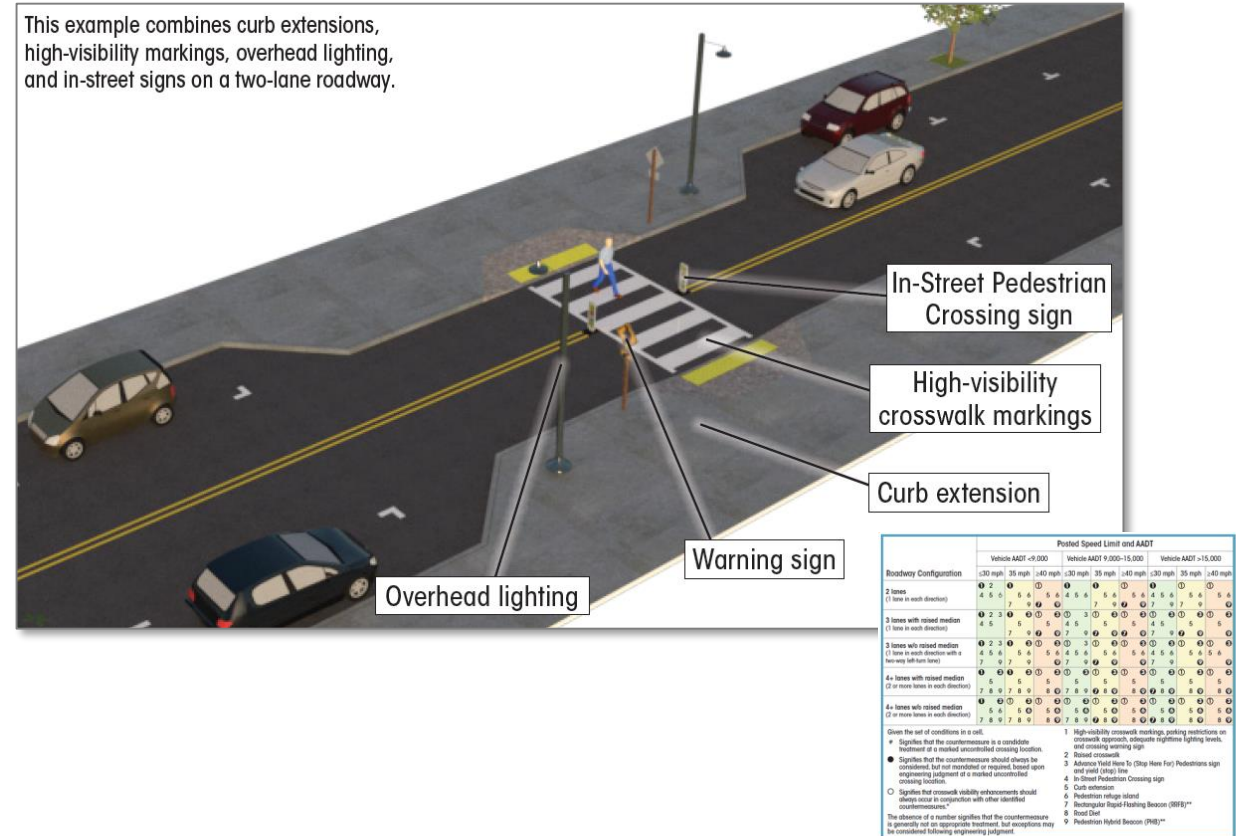
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# Crosswalk Visibility Enhancements

- Consider at all midblock and uncontrolled crossings
- Crash Reduction Factors between 23 – 48%
  - High visibility crosswalks
  - Signs
  - Curb Extension
  - Lighting
    - Place in advance of crosswalk



Source: FHWA



# Crosswalk Visibility Enhancements

- **High visibility crosswalks**
  - Consider at all midblock and uncontrolled crossings
  - Use inlay or thermoplastic tape (instead of paint or brick)
  - Reduce pedestrian injury crashes up to 40%
- **Improved intersection lighting**
  - Place luminaires in forward locations
  - Reduce pedestrian crashes up to 42%

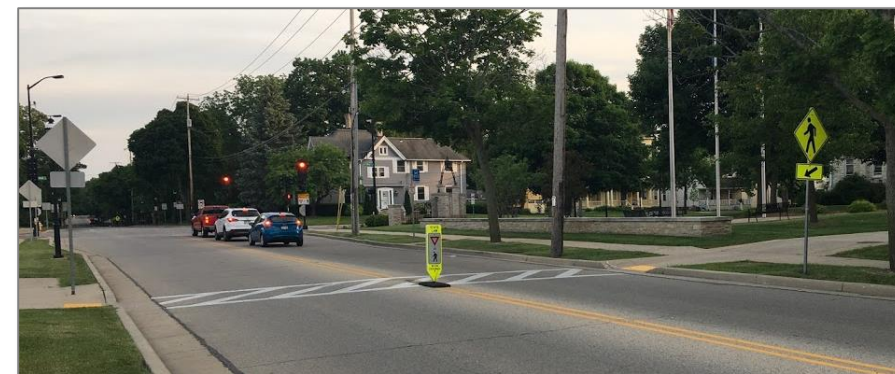


Source: FHWA



# Crosswalk Visibility Enhancements

- **Advance Yield or Stop signage and markings**
  - 20-50 feet in advance of marked crosswalk
  - Stop bar or Yield markings
  - Better sight lines to reduces multi-threat crashes
- **In-Street Pedestrian Sign**
  - Reminds drivers of state law
  - Secure to the pavement



Source: Peter Eun





# USDOT Pedestrian and Bicycle Funding Opportunities Table

[https://www.fhwa.dot.gov/environment/bicycle\\_pedestrian/funding/funding\\_opportunities.pdf](https://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/funding_opportunities.pdf)

	Pedestrian and Bicycle Funding Opportunities: U.S. Department of Transportation Transit, Safety, and Highway Funds																												
	Key: \$ = Activity may be eligible. Restrictions may apply, see program notes and guidance. ~\$ = Eligible, but not competitive unless part of a larger project.																												
	OST Programs						Federal Transit						NHISA		Federal Highway Administration														
Activity or Project Type	RAISE	INFRA	RCP	SSA	Thrive	ERIE	TJFA	ETA	ATI	TOD	AoPP	402	405	BEP BIP BER	CRP	CMAQ	HSIF	RHCP	NHPP	PRO TECT	STBG	TA	RTP	SRTS	PLAN	NSBP	ELTTP	TTP	TTPS
Access enhancements to public transportation (benches, bus pads)	\$	\$	\$	\$		~\$	~\$	\$	\$		~\$				\$	\$			\$	\$	\$	\$				\$	\$	\$	\$
Americans with Disabilities Act (ADA)/504 Self Evaluation / Transition Plan				\$	TA					\$	\$				\$						\$	\$	\$			\$		\$	\$
Barrier removal for ADA compliance	\$	\$	\$	\$		~\$	~\$	\$	\$	~\$	~\$			\$	\$				\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Bicycle plans			~\$	\$				\$		\$	\$				\$										\$	\$	\$	\$	\$
Bicycle helmets (project or training related)													\$								\$	\$	\$	\$	\$	\$	\$	\$	\$
Bicycle helmets (safety promotion)																						\$	\$	\$	\$			\$	\$
Bicycle lanes on road	~\$	~\$	\$	\$		~\$	~\$	\$	\$		~\$				\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Bicycle parking (see <a href="#">Bicycle Parking Solutions</a> )	~\$	~\$	\$	\$		~\$	\$	\$	\$	~\$					\$	\$			\$		\$	\$	\$	\$	\$		\$	\$	\$
Bike racks on transit	~\$		\$	~\$			~\$	\$	\$		~\$				\$	\$				\$	\$	\$	\$				\$	\$	\$
Bicycle repair station (air pump, simple tools)	~\$	\$	\$	~\$		~\$	~\$	\$	\$						\$						\$	\$					\$	\$	\$
Bicycle share (capital and equipment; not operations)	~\$	~\$	\$	~\$		~\$	~\$	\$	\$						\$	\$				\$	\$	\$	\$				\$	\$	\$
Bicycle storage or service centers (example: at transit hubs)	~\$		\$	~\$		~\$	\$	\$	\$						\$	\$				\$	\$	\$	\$	\$	\$		\$	\$	\$
Bridges / overcrossings for pedestrians and/or bicyclists	\$	\$	\$	\$		~\$	~\$	\$	\$					\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$		\$	\$	\$
Bus shelters and benches	\$	\$	\$	~\$		~\$	~\$	\$	\$						\$	\$				\$	\$	\$	\$			\$	\$	\$	\$
Coordinator positions (State or local) (limits on CMAQ and STBG)				\$							\$				\$						\$	\$	\$	\$		\$		\$	\$
Community Capacity Building (develop organizational skills/processes)				\$	TA					\$	\$														\$			\$	\$
Crosswalks for pedestrians, pedestrian refuge islands (new or retrofit)	\$	\$	\$	\$		~\$	~\$	\$	\$						\$	~\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Curb ramps	\$	\$	\$	\$		~\$	~\$	\$	\$						\$	~\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Counting equipment		\$	\$	\$		~\$	~\$	\$	\$								\$		\$	\$		\$	\$	\$	\$	\$	\$	\$	\$
Data collection and monitoring for pedestrians and/or bicyclists	\$	\$	\$	\$		~\$	~\$	\$	\$	\$	\$				\$				\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Emergency and evacuation routes for pedestrians and/or bicyclists	\$	\$	\$	~\$			\$	\$	\$	~\$	~\$				\$				\$	\$	\$	\$	\$	\$	\$		\$	\$	\$
Historic preservation (pedestrian and bicycle and transit facilities)	~\$		~\$	~\$		~\$	~\$	\$	\$	~\$	~\$				\$						\$	\$	\$	\$		\$	\$	\$	\$
Landscaping, streetscaping (pedestrian/bicycle route; transit access); related amenities (benches, water fountains); usually part of larger project	~\$	~\$	~\$	~\$		~\$	~\$	\$	\$	~\$	~\$				\$				~\$	\$	\$	\$	\$	\$	\$		\$	\$	\$
Lighting (pedestrian and bicyclist scale associated with pedestrian/bicyclist project)	\$	\$	\$	\$		~\$	~\$	\$	\$		~\$				\$	~\$	\$	\$	\$	\$	\$	\$	\$	\$	\$		\$	\$	\$
Maps (for pedestrians and/or bicyclists)				\$				\$	\$	\$	~\$				\$	\$					\$	\$	\$	\$	\$	\$	\$	\$	\$
Micromobility projects (including scooter share)	\$		\$	~\$		~\$	~\$			~\$					\$	\$					\$	\$					\$	\$	\$
Paved shoulders for pedestrian and/or bicyclist use	\$	~\$	\$	\$		~\$	~\$							\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Pedestrian plans	\$	~\$	~\$	\$				\$		\$	\$				\$					\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Rail at-grade crossings	\$	\$	\$	~\$		\$	\$	\$	\$								\$	\$	\$	\$	\$	\$	\$	\$	\$		\$	\$	\$
Recreational trails	\$	\$	\$	~\$		~\$	~\$													\$	\$	\$	\$	\$		\$	\$	\$	\$
Resilience Improvements for pedestrians and bicyclists	\$	\$	\$	~\$		~\$	~\$			\$	~\$			~\$	~\$	~\$			\$	\$	\$	\$	\$	\$	\$		\$	\$	\$
Road Diets (pedestrian and bicycle portions)	\$	\$	\$	\$		~\$	\$								\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$		\$	\$	\$



# Implementing Good Safety Projects

- **Using Systemic Approach**

- Install a countermeasure or related ones at numerous locations.
  - RRFBs
  - Lighting
  - Pedestrian Hybrid beacons

- **Include as many applicable countermeasures as possible at a spot safety improvement projects**

- Safe Routes to School
  - RRFBs
  - Crosswalk Visibility Enhancements
- Geometric Improvements