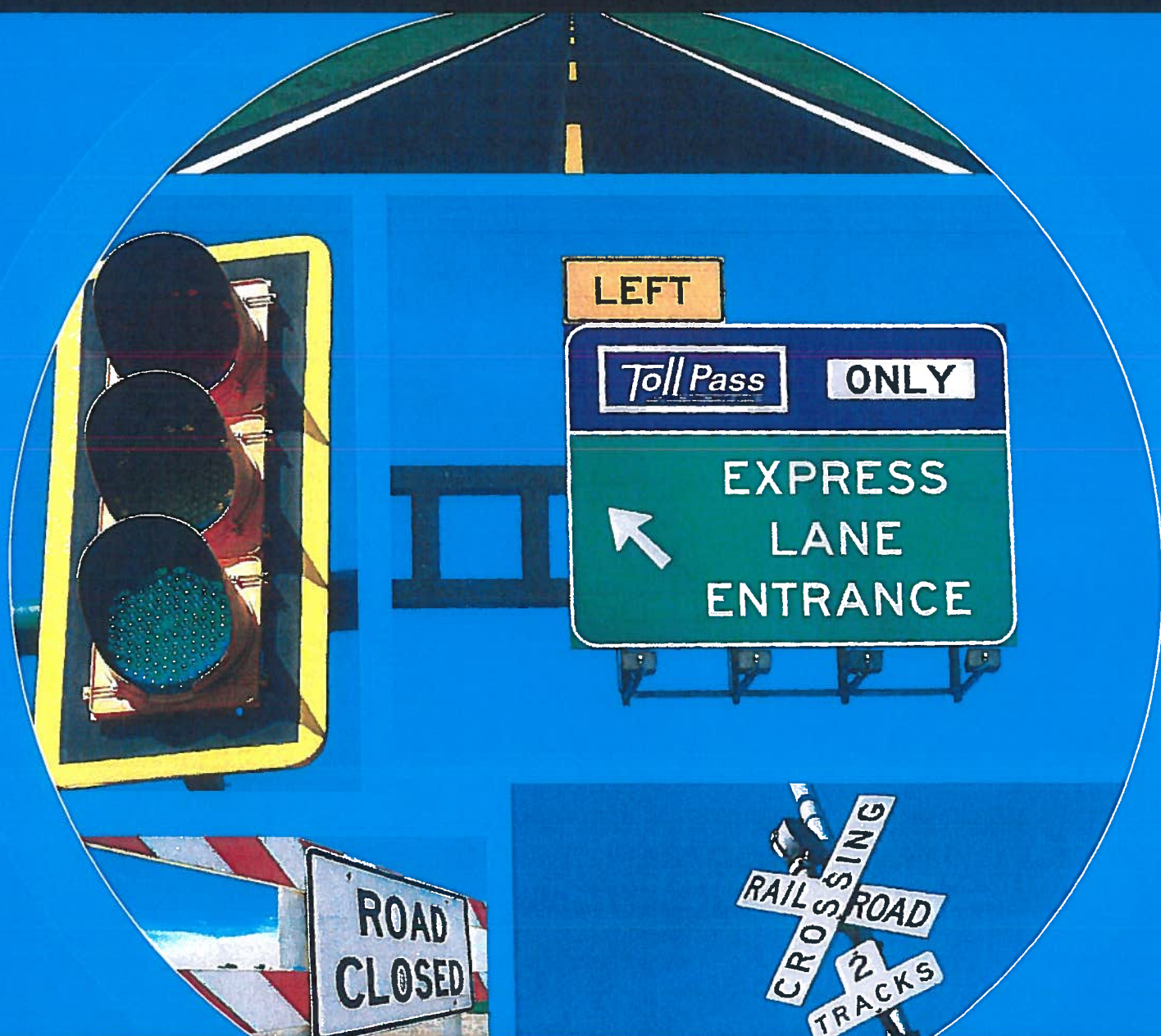


Manual on Uniform Traffic Control Devices

for Streets and Highways

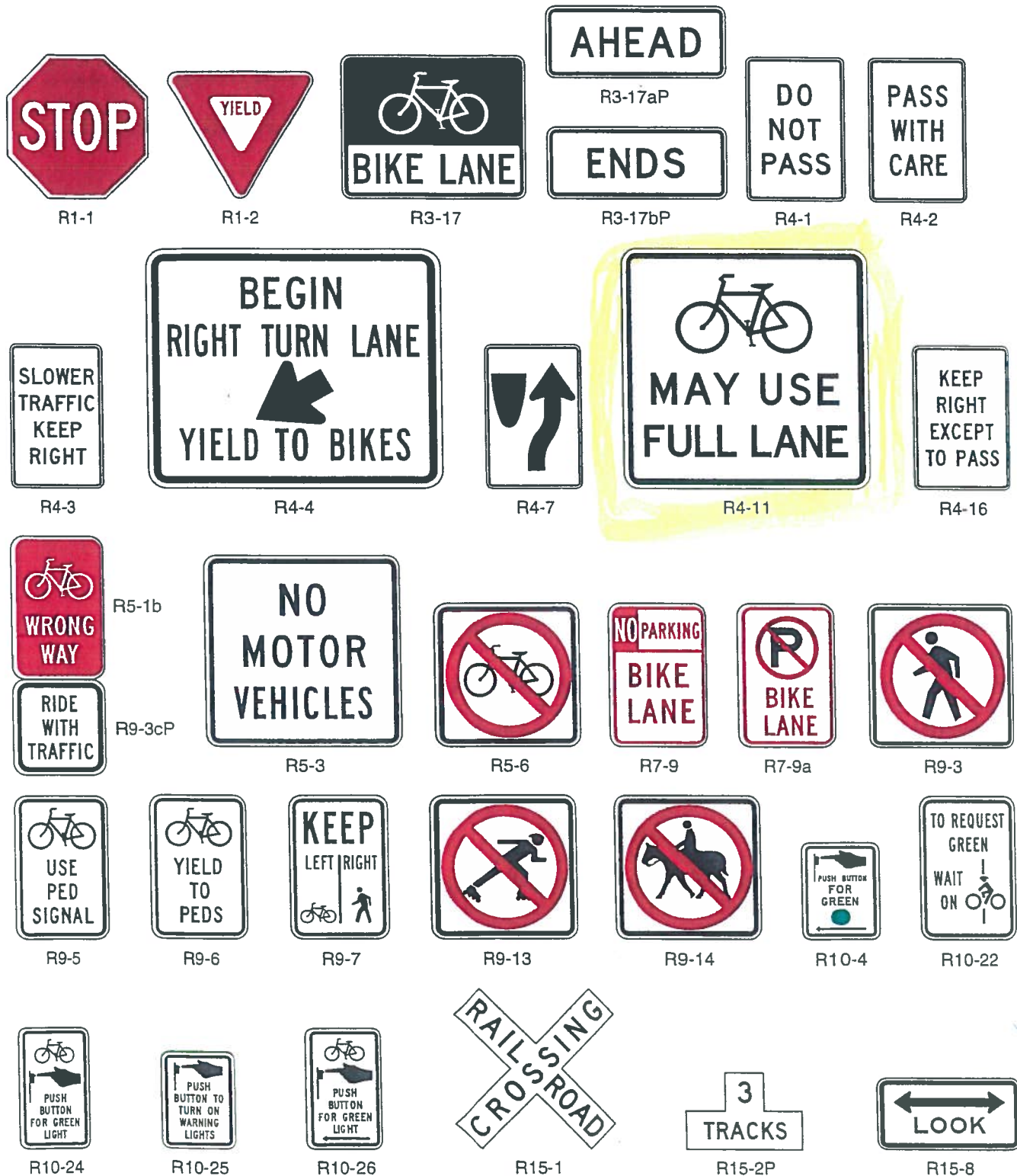
2009 Edition

Including Revision 1 dated May 2012
and Revision 2 dated May 2012



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Figure 9B-2. Regulatory Signs and Plaques for Bicycle Facilities



Option:

- 03 A 30 x 30-inch STOP sign or a 36 x 36 x 36-inch YIELD sign may be used on shared-use paths for added emphasis.

Guidance:

- 04 *Where conditions require path users, but not roadway users, to stop or yield, the STOP or YIELD sign should be placed or shielded so that it is not readily visible to road users.*
- 05 *When placement of STOP or YIELD signs is considered, priority at a shared-use path/roadway intersection should be assigned with consideration of the following:*
- A. *Relative speeds of shared-use path and roadway users,*
 - B. *Relative volumes of shared-use path and roadway traffic, and*
 - C. *Relative importance of shared-use path and roadway.*
- 06 *Speed should not be the sole factor used to determine priority, as it is sometimes appropriate to give priority to a high-volume shared-use path crossing a low-volume street, or to a regional shared-use path crossing a minor collector street.*
- 07 *When priority is assigned, the least restrictive control that is appropriate should be placed on the lower priority approaches. STOP signs should not be used where YIELD signs would be acceptable.*

Section 9B.04 Bike Lane Signs and Plaques (R3-17, R3-17aP, R3-17bP)

Standard:

- 01 The BIKE LANE (R3-17) sign and the R3-17aP and R3-17bP plaques (see Figure 9B-2) shall be used only in conjunction with marked bicycle lanes as described in Section 9C.04.

Guidance:

- 02 *If used, Bike Lane signs and plaques should be used in advance of the upstream end of the bicycle lane, at the downstream end of the bicycle lane, and at periodic intervals along the bicycle lane as determined by engineering judgment based on prevailing speed of bicycle and other traffic, block length, distances from adjacent intersections, and other considerations.*

Section 9B.05 BEGIN RIGHT TURN LANE YIELD TO BIKES Sign (R4-4)

Option:

- 01 Where motor vehicles entering an exclusive right-turn lane must weave across bicycle traffic in bicycle lanes, the BEGIN RIGHT TURN LANE YIELD TO BIKES (R4-4) sign (see Figure 9B-2) may be used to inform both the motorist and the bicyclist of this weaving maneuver (see Figures 9C-1, 9C-4, and 9C-5).

Guidance:

- 02 *The R4-4 sign should not be used when bicyclists need to move left because of a right-turn lane drop situation.*

Section 9B.06 Bicycles May Use Full Lane Sign (R4-11)

Option:

- 01 The Bicycles May Use Full Lane (R4-11) sign (see Figure 9B-2) may be used on roadways where no bicycle lanes or adjacent shoulders usable by bicyclists are present and where travel lanes are too narrow for bicyclists and motor vehicles to operate side by side.
- 02 The Bicycles May Use Full Lane sign may be used in locations where it is important to inform road users that bicyclists might occupy the travel lane.
- 03 Section 9C.07 describes a Shared Lane Marking that may be used in addition to or instead of the Bicycles May Use Full Lane sign to inform road users that bicyclists might occupy the travel lane.

Support:

- 04 The Uniform Vehicle Code (UVC) defines a "substandard width lane" as a "lane that is too narrow for a bicycle and a vehicle to travel safely side by side within the same lane."

Section 9B.07 Bicycle WRONG WAY Sign and RIDE WITH TRAFFIC Plaque (R5-1b, R9-3cP)

Option:

- 01 The Bicycle WRONG WAY (R5-1b) sign and RIDE WITH TRAFFIC (R9-3cP) plaque (see Figure 9B-2) may be placed facing wrong-way bicycle traffic, such as on the left side of a roadway.
- 02 This sign and plaque may be mounted back-to-back with other signs to minimize visibility to other traffic.

Support:

- 14 Examples of bicycle lane markings at right-turn lanes are shown in Figures 9C-1, 9C-4, and 9C-5. Examples of pavement markings for bicycle lanes on a two-way street are shown in Figure 9C-6. Pavement word message, symbol, and arrow markings for bicycle lanes are shown in Figure 9C-3.

Section 9C.05 Bicycle Detector Symbol

Option:

- 01 A symbol (see Figure 9C-7) may be placed on the pavement indicating the optimum position for a bicyclist to actuate the signal.
- 02 An R10-22 sign (see Section 9B.13 and Figure 9B-2) may be installed to supplement the pavement marking.

Section 9C.06 Pavement Markings for Obstructions

Guidance:

- 01 *In roadway situations where it is not practical to eliminate a drain grate or other roadway obstruction that is inappropriate for bicycle travel, white markings applied as shown in Figure 9C-8 should be used to guide bicyclists around the condition.*

Section 9C.07 Shared Lane Marking

Option:

- 01 The Shared Lane Marking shown in Figure 9C-9 may be used to:
- A. Assist bicyclists with lateral positioning in a shared lane with on-street parallel parking in order to reduce the chance of a bicyclist's impacting the open door of a parked vehicle,
 - B. Assist bicyclists with lateral positioning in lanes that are too narrow for a motor vehicle and a bicycle to travel side by side within the same traffic lane,
 - C. Alert road users of the lateral location bicyclists are likely to occupy within the traveled way,
 - D. Encourage safe passing of bicyclists by motorists, and
 - E. Reduce the incidence of wrong-way bicycling.

Guidance:

- 02 *The Shared Lane Marking should not be placed on roadways that have a speed limit above 35 mph.*

Standard:

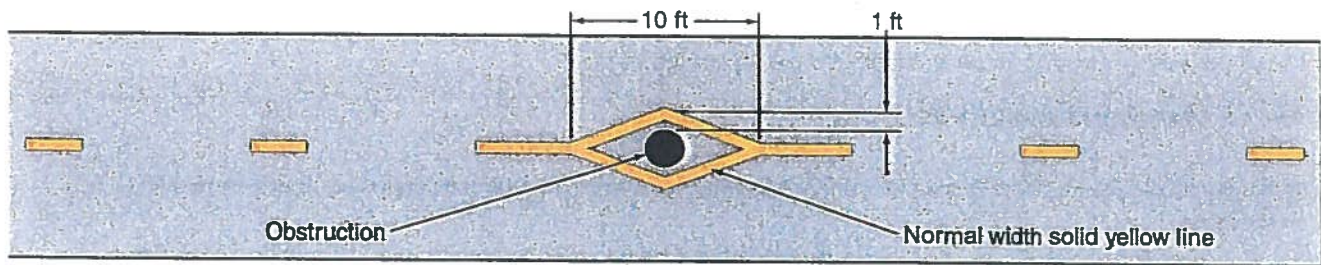
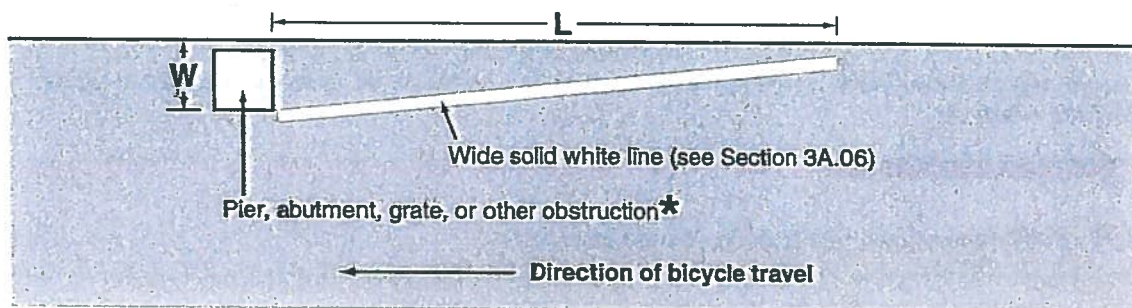
- 03 **Shared Lane Markings shall not be used on shoulders or in designated bicycle lanes.**

Guidance:

- 04 *If used in a shared lane with on-street parallel parking, Shared Lane Markings should be placed so that the centers of the markings are at least 11 feet from the face of the curb, or from the edge of the pavement where there is no curb.*
- 05 *If used on a street without on-street parking that has an outside travel lane that is less than 14 feet wide, the centers of the Shared Lane Markings should be at least 4 feet from the face of the curb, or from the edge of the pavement where there is no curb.*
- 06 *If used, the Shared Lane Marking should be placed immediately after an intersection and spaced at intervals not greater than 250 feet thereafter.*

Option:

- 07 Section 9B.06 describes a Bicycles May Use Full Lane sign that may be used in addition to or instead of the Shared Lane Marking to inform road users that bicyclists might occupy the travel lane.

Figure 9C-8. Examples of Obstruction Pavement Markings**A - Obstruction within the path****B - Obstruction at edge of path or roadway**

$L = WS$, where W is the offset in feet and S is bicycle approach speed in mph

★ Provide an additional foot of offset for a raised obstruction and use the formula
 $L = (W+1) S$ for the taper length

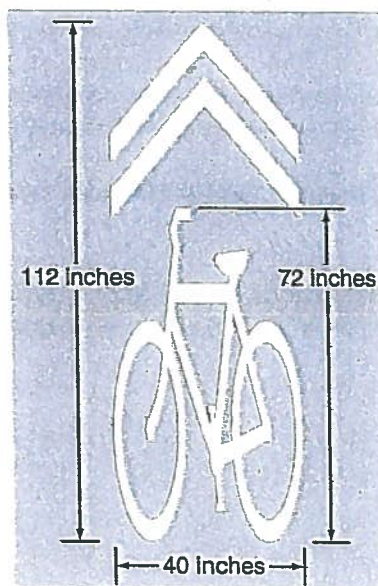
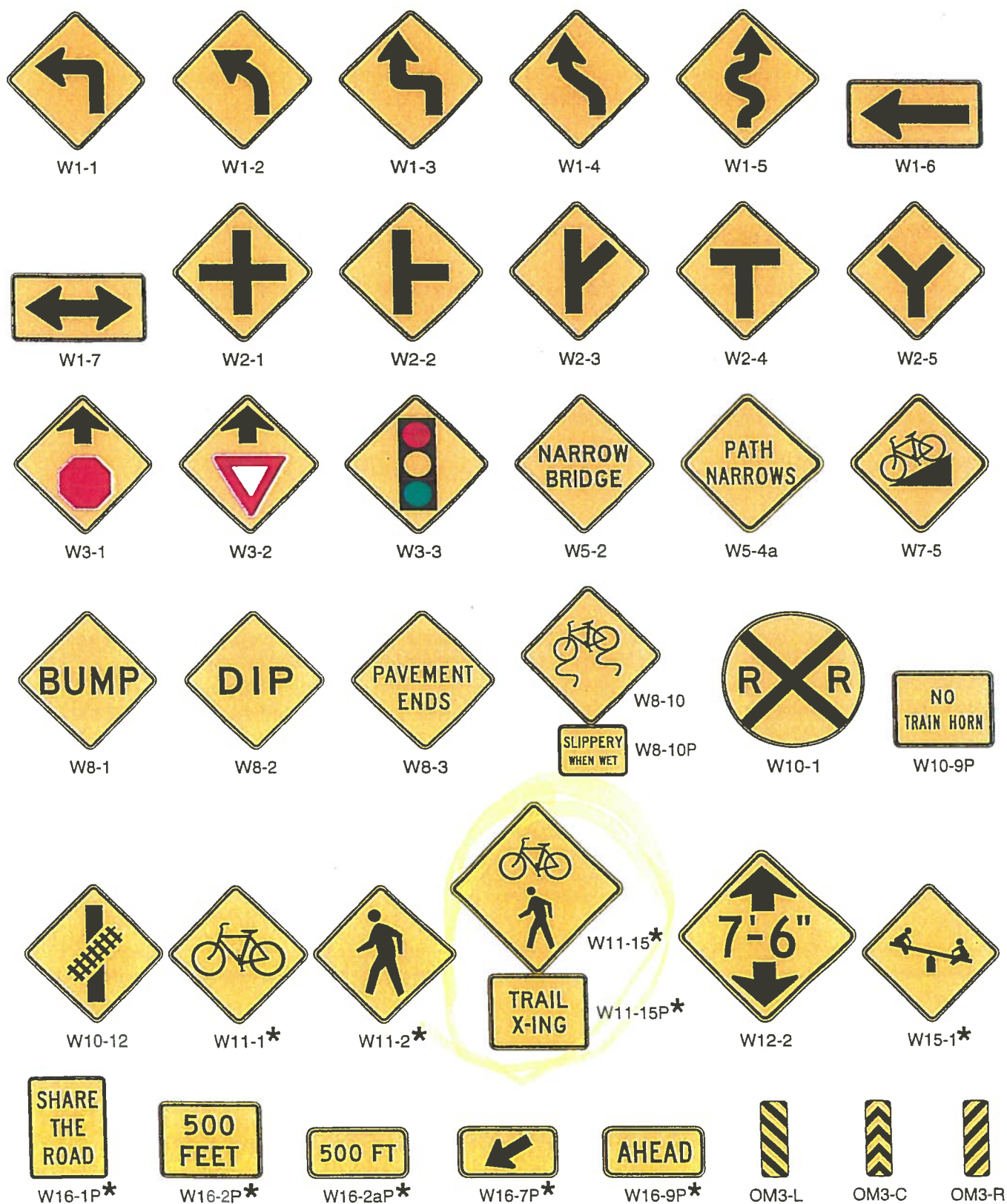
Figure 9C-9. Shared Lane Marking

Figure 9B-3. Warning Signs and Plaques and Object Markers for Bicycle Facilities



* A fluorescent yellow-green background color may be used for this sign or plaque. The background color of the plaque should match the color of the warning sign that it supplements.

Standard:

- 05 **Bicycle Warning and combined Bicycle/Pedestrian signs, when used at the location of the crossing, shall be supplemented with a diagonal downward pointing arrow (W16-7P) plaque (see Figure 9B-3) to show the location of the crossing.**

Option:

- 06 A fluorescent yellow-green background color with a black legend and border may be used for Bicycle Warning and combined Bicycle/Pedestrian signs and supplemental plaques.

Guidance:

- 07 *When the fluorescent yellow-green background color is used, a systematic approach featuring one background color within a zone or area should be used. The mixing of standard yellow and fluorescent yellow-green backgrounds within a zone or area should be avoided.*

Section 9B.19 Other Bicycle Warning Signs**Option:**

- 01 Other bicycle warning signs (see Figure 9B-3) such as PATH NARROWS (W5-4a) and Hill (W7-5) may be installed on shared-use paths to warn bicyclists of conditions not readily apparent.

- 02 In situations where there is a need to warn motorists to watch for bicyclists traveling along the highway, the SHARE THE ROAD (W16-1P) plaque (see Figure 9B-3) may be used in conjunction with the W11-1 sign.

Guidance:

- 03 *If used, other advance bicycle warning signs should be installed at least 50 feet in advance of the beginning of the condition.*

- 04 *Where temporary traffic control zones are present on bikeways, appropriate signs from Part 6 should be used.*

Option:

- 05 Other warning signs described in Chapter 2C may be installed on bicycle facilities as appropriate.

Section 9B.20 Bicycle Guide Signs (D1-1b, D1-1c, D1-2b, D1-2c, D1-3b, D1-3c, D11-1, D11-1c)**Option:**

- 01 Bike Route Guide (D11-1) signs (see Figure 9B-4) may be provided along designated bicycle routes to inform bicyclists of bicycle route direction changes and to confirm route direction, distance, and destination.

- 02 If used, Bike Route Guide signs may be repeated at regular intervals so that bicyclists entering from side streets will have an opportunity to know that they are on a bicycle route. Similar guide signing may be used for shared roadways with intermediate signs placed for bicyclist guidance.

- 03 Alternative Bike Route Guide (D11-1c) signs may be used to provide information on route direction, destination, and/or route name in place of the "BIKE ROUTE" wording on the D11-1 sign (see Figures 9B-4 and 9B-6).

- 04 Destination (D1-1, D1-1a) signs, Street Name (D3) signs, or Bicycle Destination (D1-1b, D1-1c, D1-2b, D1-2c, D1-3b, D1-3c) signs (see Figure 9B-4) may be installed to provide direction, destination, and distance information as needed for bicycle travel. If several destinations are to be shown at a single location, they may be placed on a single sign with an arrow (and the distance, if desired) for each name. If more than one destination lies in the same direction, a single arrow may be used for the destinations.

Guidance:

- 05 *Adequate separation should be made between any destination or group of destinations in one direction and those in other directions by suitable design of the arrow, spacing of lines of legend, heavy lines entirely across the sign, or separate signs.*

Standard:

- 06 **An arrow pointing to the right, if used, shall be at the extreme right-hand side of the sign. An arrow pointing left or up, if used, shall be at the extreme left-hand side of the sign. The distance numerals, if used, shall be placed to the right of the destination names.**

- 07 **On Bicycle Destination signs, a bicycle symbol shall be placed next to each destination or group of destinations. If an arrow is at the extreme left, the bicycle symbol shall be placed to the right of the respective arrow.**

Guidance:

- 08 *Unless a sloping arrow will convey a clearer indication of the direction to be followed, the directional arrows should be horizontal or vertical.*

Figure 9B-7. Examples of Signing and Markings for a Shared-Use Path Crossing

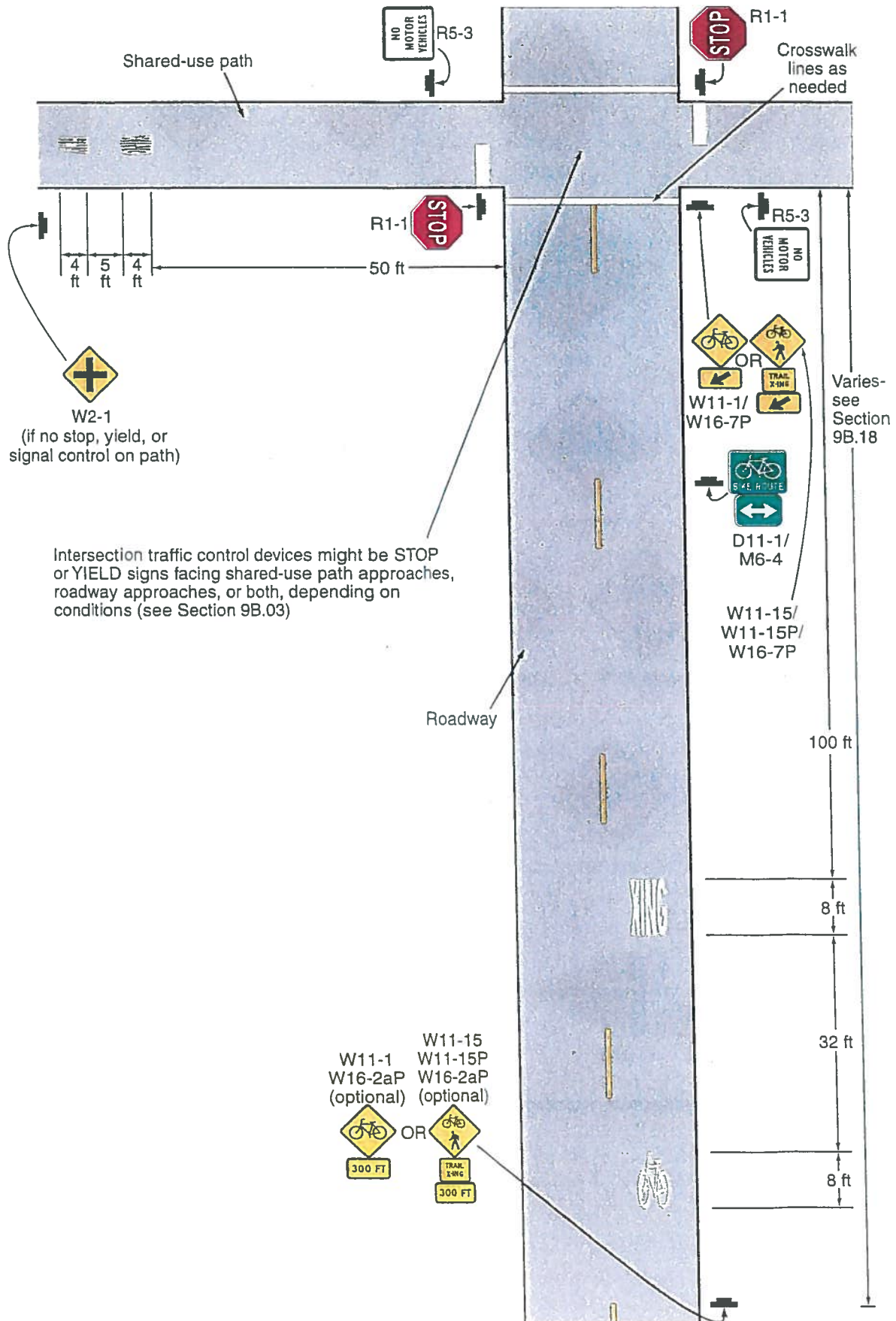
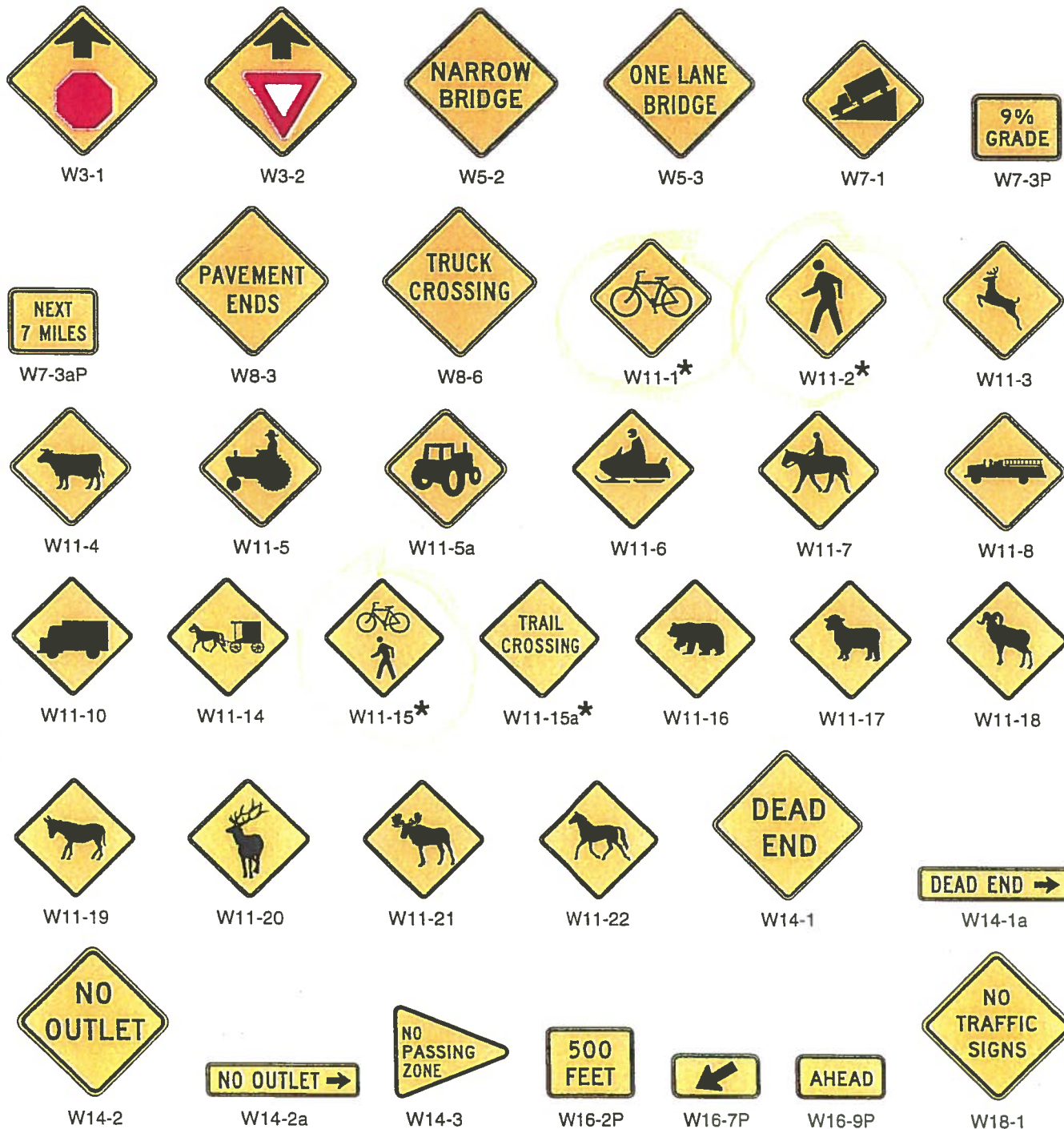


Figure 5C-2. Other Warning Signs and Plaques on Low-Volume Roads

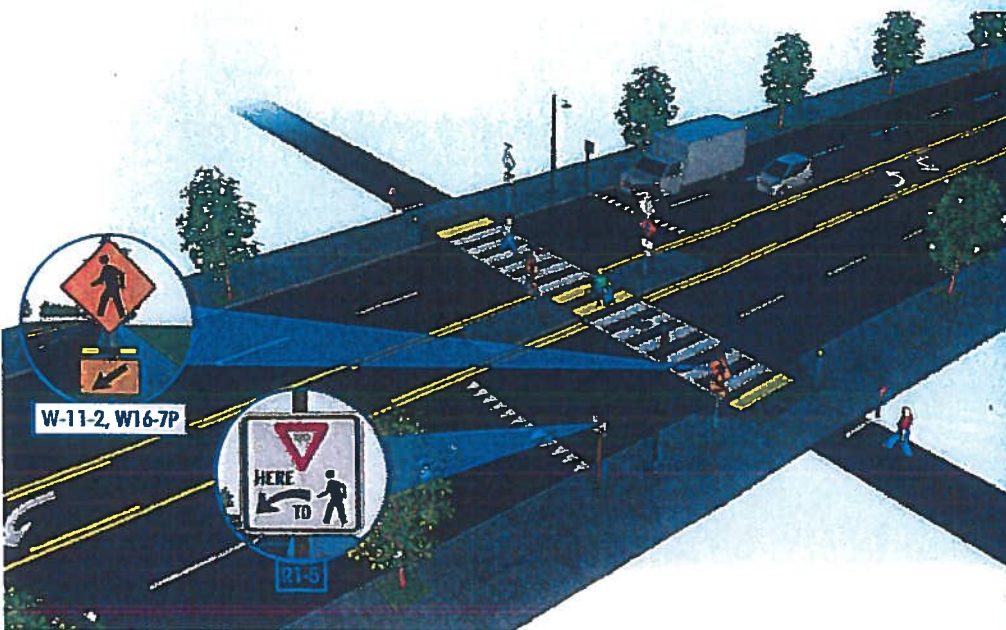


* A fluorescent yellow-green background color may be used for this sign or plaque

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:

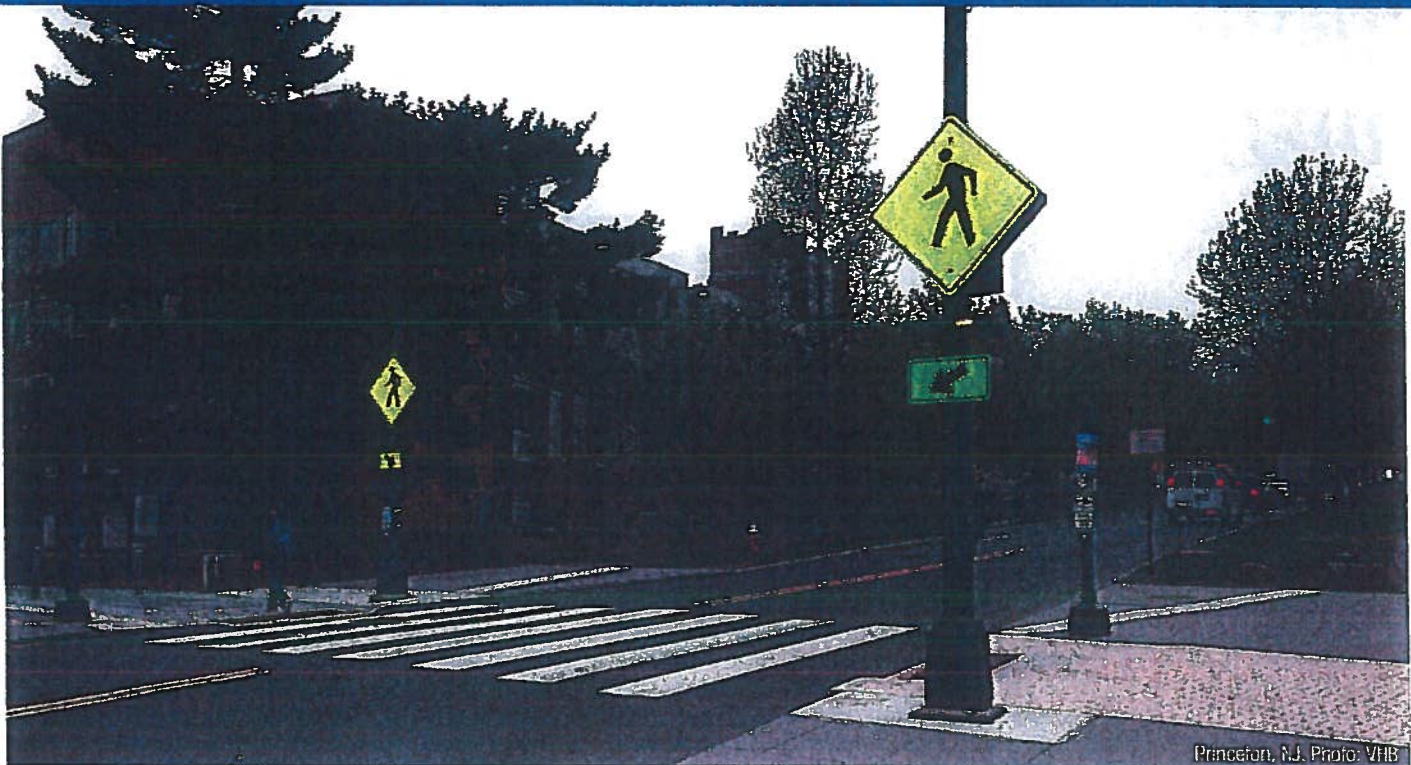
- Enhanced warning improves motorist yielding

OFTEN USED WITH:

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

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

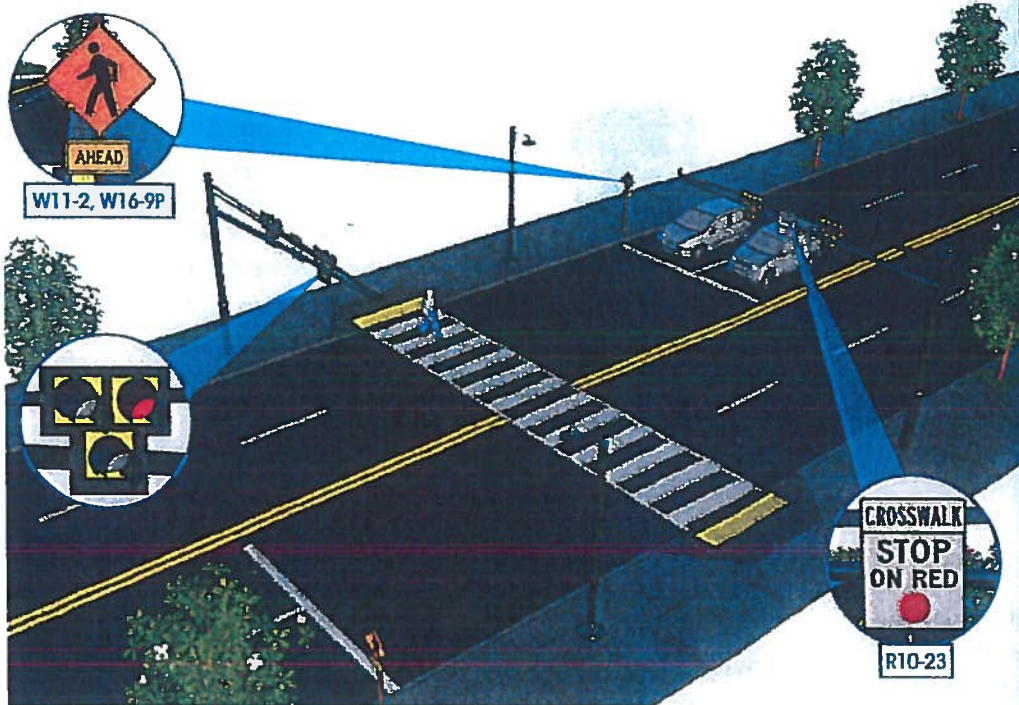
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Pedestrian Hybrid Beacon (PHB)


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.

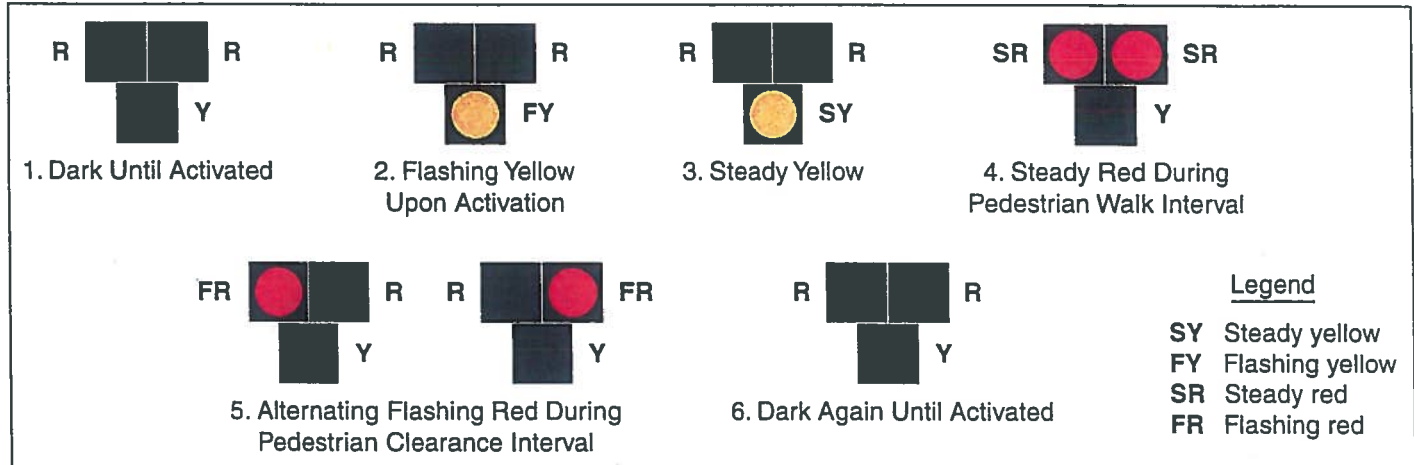
OFTEN USED WITH:

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

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.

CONSIDERATIONS

PHBs are a candidate treatment for roads with three or more lanes that generally have annual average daily traffic (AADT) above 9,000. PHBs should be strongly considered for all midblock and intersection crossings where the roadway speed limits are equal to or greater than 40 miles per hour (mph). The PHB should meet the application guidelines provided in the *Manual on Uniform Traffic Control Devices* for existing or projected pedestrian volumes.

PHBs are intended for installation at midblock locations, but can be installed at intersections. They should only be installed

in conjunction with marked crosswalks and pedestrian countdown signals.

When PHBs are not in common use in a community, consider conducting an outreach effort to educate the public and law enforcement officers on the PHBs' purpose and use.

COST

The PHB is often less expensive than a full traffic signal installation. The costs range from \$21,000 to \$128,000, with an average per unit cost of \$57,680.

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.

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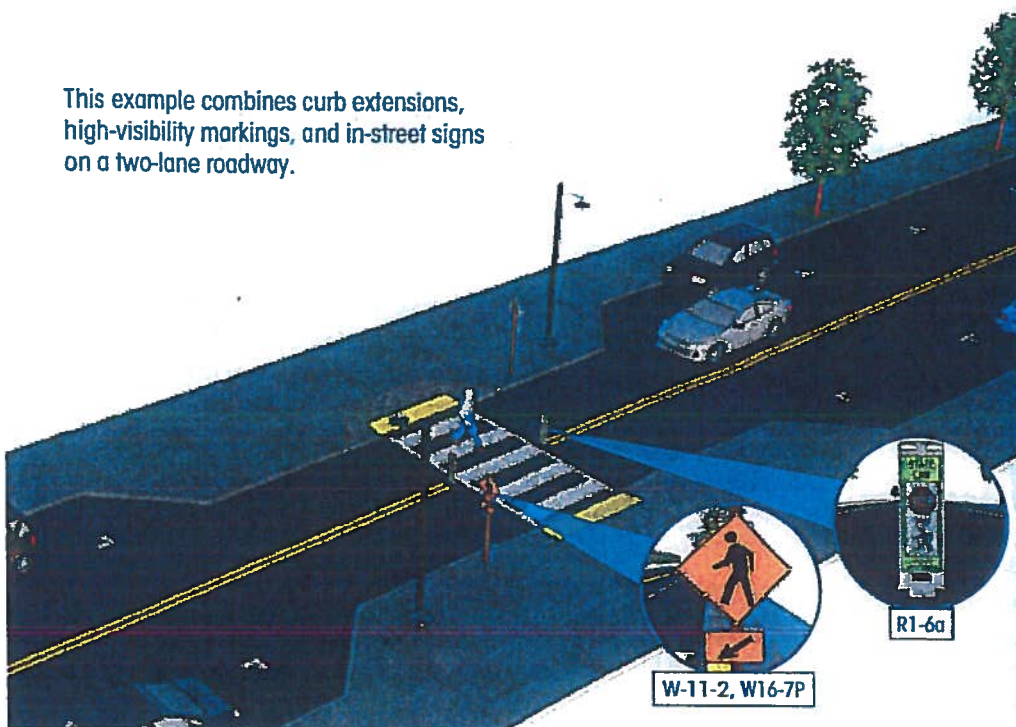
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Crosswalk Visibility Enhancements

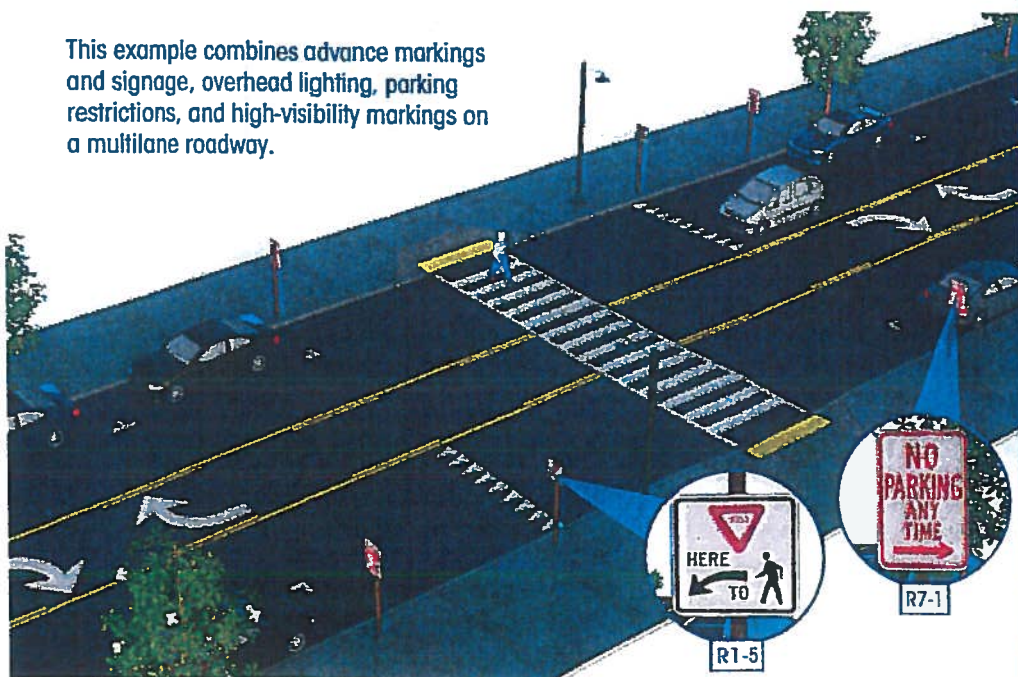
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COUNTERMEASURE TECH SHEET

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 at 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.



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Crosswalk Visibility Enhancements

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

CONSIDERATIONS

This group of countermeasures includes improved lighting, advance or in-street warning signage, pavement markings, and geometric design elements. Such features may be used in combination to indicate optimal or preferred locations for people to cross and to help reinforce the driver requirement to yield the right-of-way to pedestrians at crossing locations.

High-visibility crosswalk marking. High-visibility crosswalks are preferred over parallel line crosswalks and should be provided at all established midblock pedestrian crossings. They should also be considered at uncontrolled intersections.

Parking restriction on the crosswalk approach. Parking restriction can include the removal of parking space markings, installation of new "parking prohibition" pavement markings or curb paint, and signs. The minimum setback is 20 feet in advance of the crosswalk where speeds are 25 mph or less, and 30 feet where speeds are between 26 and 35 mph.

Advance YIELD or STOP markings and signs.¹ The stop bar or "sharks teeth" yield markings are placed 20 to 50 feet in advance of a marked crosswalk to indicate where vehicles are required to stop or yield in compliance with the accompanying "STOP Here for Pedestrians" or "YIELD Here to Pedestrians" sign.

¹MUTCD section 2B.12 In-Street and Overhead Pedestrian Crossing Signs (R1-6, R1-6a, R1-9, and R1-9a)

²MUTCD reference Section 2B.11 Yield Here To Pedestrians Signs and Stop Here For Pedestrians Signs (R1-5 Series)

Curb extension. This treatment, also referred to as bulb-outs, extends the sidewalk or curb line out into the parking lane, which reduces the effective street width. Curb extensions must not extend into travel lanes and should not extend across bicycle lanes.

Improved nighttime lighting. Consideration should be given to placing lights in advance of midblock and intersection crosswalks on both approaches to illuminate the front of the pedestrian and avoid creating a silhouette.

In-street STOP or YIELD to pedestrian sign.² These signs serve to remind road users of laws regarding right-of-way, and they may be appropriate on 2-lane or 3-lane roads where speed limits are 30 mph or less. The sign can be placed in between travel lanes or in a median.

COST

Countermeasure	Range	Average
High visibility crosswalk marking	\$600-5,700 each	\$2,540 each
Lighting	Varies based on fixture type and utility service agreement	
Parking restriction	Varies based on the required signs and pavement markings	
Curb extension	\$2,000-20,000	\$13,000 each
Advance STOP/YIELD sign	N/A	\$300 each
Advance STOP/YIELD line	N/A	\$320 each
In-street STOP/YIELD sign	N/A	\$240 each

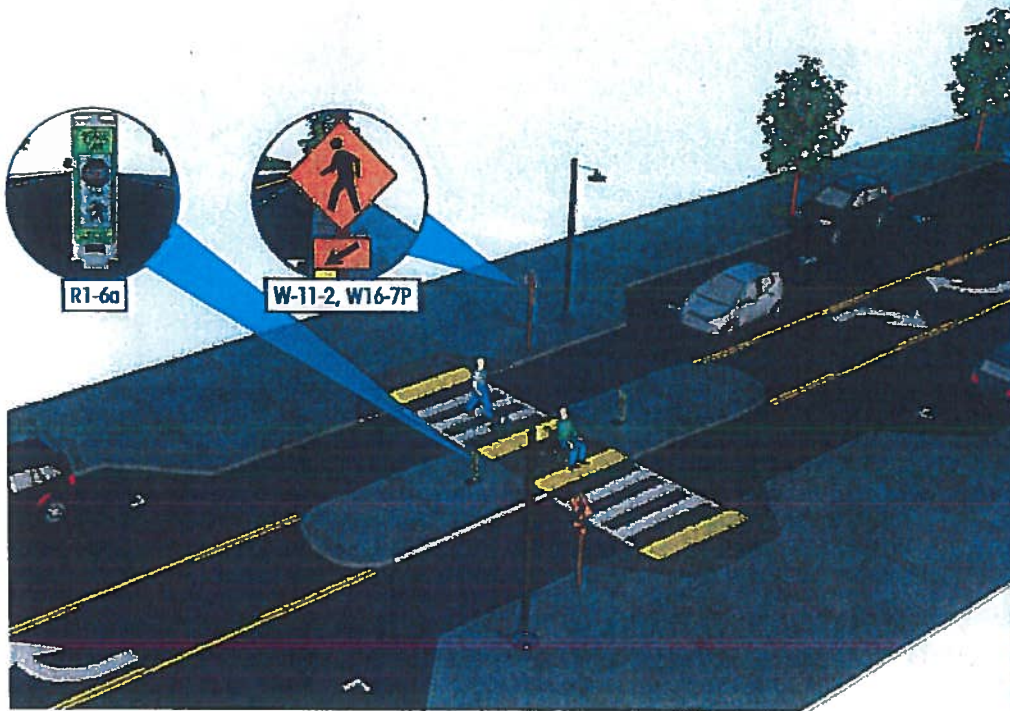
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 - Lighting and Illumination: http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=8
 - Parking Restrictions: http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=9
 - Curb Extensions: http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=5
 - Advance Stop/Yield Lines: http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=13

Pedestrian Refuge Island

SAFE TRANSPORTATION FOR EVERY PEDESTRIAN

COUNTERMEASURE TECH SHEET



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.



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)

Pedestrian Refuge Island

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



CONSIDERATIONS

The design must accommodate pedestrians with disabilities. Islands should be at least 4 feet wide (preferably 8 feet) and of adequate length to allow the anticipated number of pedestrians to stand and wait for gaps in traffic before crossing. The cut-through must include detectable warnings if island width is at least 6 feet.

Islands should be illuminated or highlighted with street lights, signs, and/or reflectors to ensure that they are visible to motorists. They can be constructed so that crossing pedestrians are directed to the right, so they can more easily view oncoming traffic after they are halfway through the crossing. If applicable, evaluate the impact of the island on bicycle facility design.

COST

The cost of a median island depends on its size and construction materials. The costs range from \$2,140 to \$41,170 per island, depending on the length of the island, with an average cost of \$13,520. The average cost per square foot is approximately \$10. Costs will be higher for concrete islands versus asphalt islands, though the lifespan of concrete is longer compared to the lifespan of asphalt. Cost reductions may be realized if the refuge island can be incorporated into planned roadway improvements or utility work.

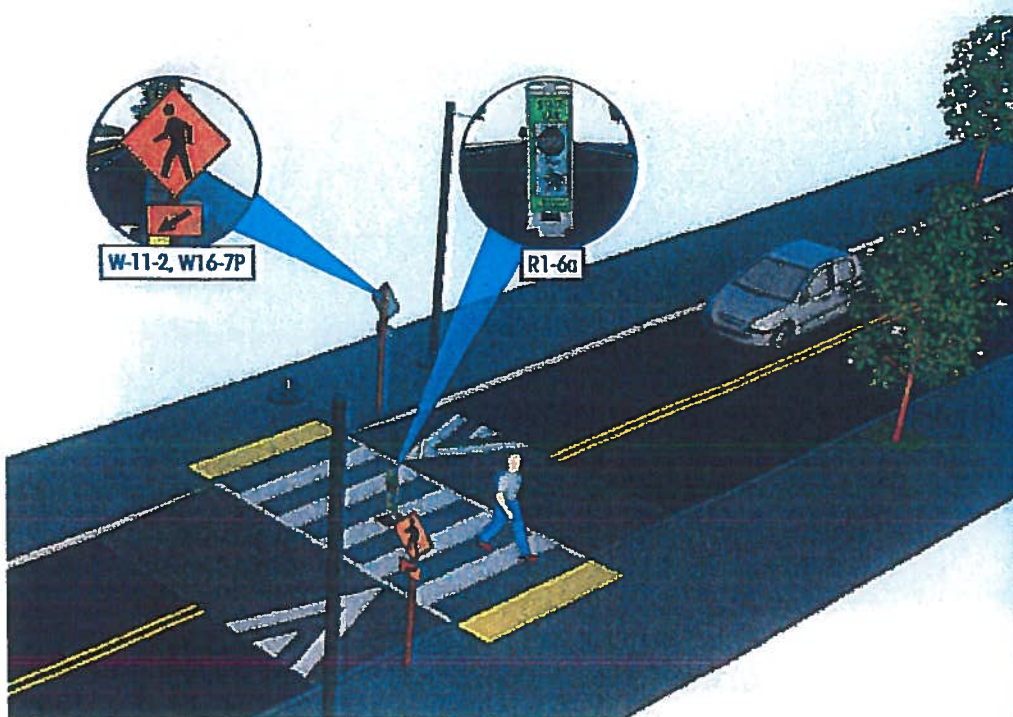
References

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- Federal Highway Administration. (2013). "Crossing Islands" in PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System. Available: http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=6
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Raised Crosswalk

SAFE TRANSPORTATION FOR EVERY PEDESTRIAN


COUNTERMEASURE TECH SHEET




Raised crosswalks are ramped speed tables spanning the entire width of the roadway, often placed at midblock crossing locations. The crosswalk is demarcated with paint and/or special paving materials. These crosswalks act as traffic-calming measures that allow the pedestrian to cross at grade with the sidewalk.

In addition to their use on local and collector streets, raised crosswalks can be installed in campus settings, shopping centers, and pick-up/drop-off zones (e.g., airports, schools, transit centers).

Raised crosswalks are flush with the height of the sidewalk. The crosswalk table is typically at least 10 feet wide and designed to allow the front and rear wheels of a passenger vehicle to be on top of the table at the same time. Detectable warnings (truncated domes) and curb ramps are installed at the street edge for pedestrians with impaired vision.

 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

Raised Crosswalk

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



CONSIDERATIONS

Raised crosswalks are typically installed on 2-lane or 3-lane roads with speed limits of 30 mph or less and annual average daily traffic (AADT) below about 9,000. Raised crossings should generally be avoided on truck routes, emergency routes, and arterial streets.

Drainage can be an issue. Raised crosswalks may be installed with curb extensions where parking exists. They may also be used at intersections, particularly at the entrance of the minor street.

Since this countermeasure can cause discomfort and noise (especially with larger vehicles), it may be appropriate to get public buy-in. Raised crosswalks may not be appropriate for bus transit routes or primary emergency vehicle routes. For States that experience regular snowfall, snowplowing can be a concern.

COST

The cost associated with a raised crosswalk ranges from \$7,110 to \$30,880 each, with the average cost estimated at \$8,170.

References

Federal Highway Administration. (2013). "Raised Pedestrian Crossings" in PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System. Available: http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=7

Thomas, L., Thirsk, N. J., & Zegeer, C. (2016). NCHRP Synthesis 498: Application of Pedestrian Crossing Treatments for Streets and Highways. Transportation Research Board, Washington D.C.

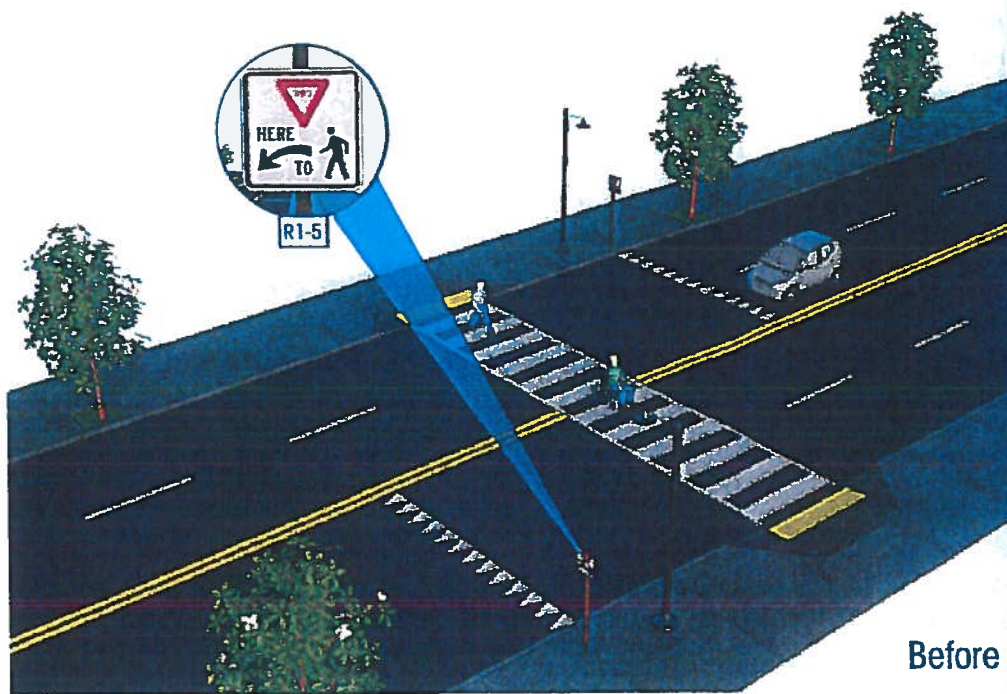
Bushell, M., Poole, B., Zegeer, C., & Rodriguez, D. (2013). Costs for Pedestrian and Bicyclist Infrastructure Improvements: A Resource for Researchers, Engineers, Planners, and the General Public. Pedestrian and Bicycle Information Center.

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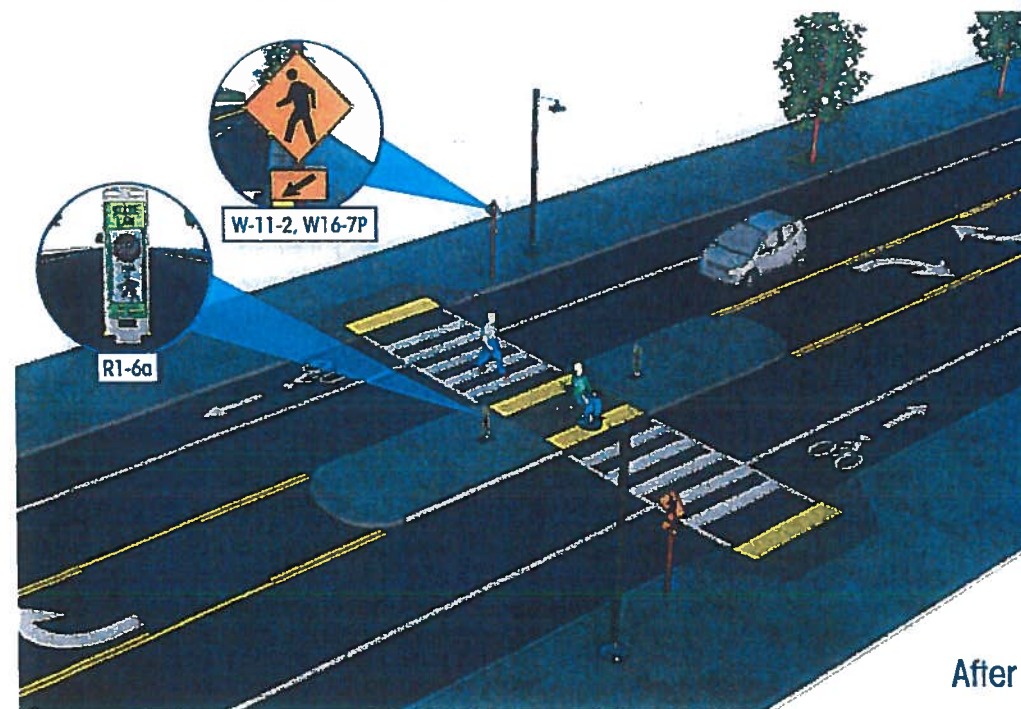
Road Diet

SAFE TRANSPORTATION FOR EVERY PEDESTRIAN

COUNTERMEASURE TECH SHEET



Before



After



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.

Road Diet

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

A typical Road Diet converts an existing four-lane, undivided roadway to two through lanes and a center, two-way left turn lane. This design allows left-turning drivers to exit the traffic stream while waiting for a gap to complete their turn and frees up space that can be reallocated to other uses, including:

- » Pedestrian refuge island
- » Crosswalk visibility enhancements, such as curb extensions
- » On-street parking, with parking restrictions on crosswalk approaches
- » Widened sidewalks and landscaped buffers
- » Bicycle lane and/or transit lanes

A Road Diet can be a relatively low-cost safety solution, particularly where only pavement marking modifications are required to implement the reconfigured roadway design. When planning in conjunction with reconstruction or overlay projects, the change in cross section may be completed without any additional cost.

CONSIDERATIONS

While Road Diets are effective countermeasures for midblock collisions, they are not recommended for all multilane roadways. Typically, a suitable roadway has a current and future average daily traffic (ADT) equal to or less than about 20,000. In some instances, Road Diets have been successfully used on roads with ADTs as high as 25,000.

FHWA's Road Diet Informational Guide provides a closer look at the safety and operational benefits of Road Diets to help agencies determine if this countermeasure may suit their needs. Communities will need to consider a range of factors, including:

- » Vehicle speed
- » Level of Service (LOS)
- » Quality of Service
- » Vehicle volume (ADT)
- » The operation and volume of pedestrians, bicyclists, transit, and freight
- » Peak hour and peak direction traffic flow
- » Vehicle turning volumes and patterns
- » Frequency of stopping and slow moving vehicles
- » Presence of parallel roadways

Since Road Diets may be new or uncommon in a community, consider conducting an outreach effort to educate the public on the purpose and potential benefits.

COST

The cost associated with a Road Diet can vary widely. Restriping costs for the three lanes plus bicycle lanes are estimated at \$25,000 to \$40,000 per mile, depending on the amount of lane lines that need to be repainted. When a Road Diet involves geometric features like extended sidewalks, curb extensions, a raised median or refuge island, the costs can increase to \$100,000 or more per mile.

References

- Pawlovich, M.D., W. Li, A. Carriquiry, and T. Welch. "Iowa's Experience with Road Diet Measures—Use of Bayesian Approach to Assess Impacts on Crash Frequencies and Crash Rates." Transportation Research Record: Journal of the Transportation Research Board, No. 1953, Transportation Research Board, Washington, D.C., 2006.
- Persaud, B., B. Lan, C. Lyon, and R. Bhim. "Comparison of empirical Bayes and full Bayes approaches for before-after road safety evaluations." Accident Analysis & Prevention, Volume 42, Issue 1, 2010, pp. 38-43.
- Knapp, K., B. Chandler, J. Atkinson, T. Welch, H. Rigdon, R. Retting, S. Meekins, E. Widstrand, and R.J. Porter. (2014). Road Diet Informational Guide. FHWA-SA-14-028, Federal Highway Administration Office of Safety, Washington, D.C. Available: https://safety.fhwa.dot.gov/road_diets/guidance/info_guide/form.cfm
- Federal Highway Administration. (2013). "Lane Reduction (Road Diet)" in PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System. Available: http://www.pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=19



Department of Transportation

TRAFFIC SAFETY
& MOBILITY

INSTRUCTION

TSMI
16-02
Code: TOB

SUBJECT: IN-STREET AND OVERHEAD PEDESTRIAN CROSSING SIGNS

Target Audience:

- | | |
|--|--|
| <input checked="" type="checkbox"/> Regional Traffic Engineer | <input checked="" type="checkbox"/> Construction |
| <input checked="" type="checkbox"/> Operations & Asset Mgt. Div. | <input checked="" type="checkbox"/> Design |
| <input checked="" type="checkbox"/> Regional Dir. of Operations | <input checked="" type="checkbox"/> Maintenance |
| <input checked="" type="checkbox"/> Regional Director | <input type="checkbox"/> _____ |

Approved:


Robert Linoges, P.E., Acting Director
Office of Traffic Safety & Mobility

05/16/2016
Date

ADMINISTRATIVE INFORMATION: This Office of Traffic Safety & Mobility Instruction (TSMI) is effective immediately. It supersedes TED 05-002.

PURPOSE: This TSMI is intended to provide general direction in terms of guidelines and responsibility for the installation, operation and maintenance of In-Street and Overhead Pedestrian Crossing signs on State highways.

BACKGROUND: In-Street and Overhead Pedestrian Crossing signs are found in Section 2B.12 of the National Manual on Uniform Traffic Control Devices (MUTCD) and the New York State Supplement. The sign is used to remind road users of laws regarding right-of-way at an unsignalized pedestrian crosswalk.

New York implemented one of the first in-street pedestrian sign programs in the country in 1996. Eventually, an In-Street Pedestrian sign was developed for the 2003 MUTCD.

Section 1154 of the New York State Vehicle & Traffic Law requires motorists to YIELD to pedestrians in a crosswalk (eastern rule) while other states specifically require a STOP (western rule) by motorists. As a result, the MUTCD includes versions of the In-Street and Overhead Pedestrian signs that feature the YIELD and STOP symbols. Consequently, the New York State Supplement restricts the use of the R1-6a or R1-9a signs which utilize the STOP symbol.

TECHNICAL INFORMATION: Information regarding In-Street and Overhead Pedestrian (R1-6 and R1-9) signs can be found in the MUTCD and the New York State Supplement. The following combines guidance from a variety of sources such as the MUTCD, the State Supplement, the V&T Law, and internal policy (TED 05-02) to provide a condensed version of the laws, regulations, and policies concerning the use of In-Street and Overhead Pedestrian Signs (R1-6 and R1-9) on state highways.

The Use of In-Street and Overhead Pedestrian Signs (R1-6 and R1-9) on State Highways in New York

MUTCD & State Supplement Provisions:

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

Option:

01 The In-Street Pedestrian Crossing (R1-6) sign (see Figure 2B-2) or the Overhead Pedestrian Crossing (R1-9) sign (see [Figure 2B-2](#)) may be used to remind road users of laws regarding right-of-way at an unsignalized pedestrian crosswalk.

02 Highway agencies may develop and apply criteria for determining the applicability of In-Street Pedestrian Crossing signs.



SUBJECT: IN-STREET AND OVERHEAD PEDESTRIAN CROSSING SIGNS

Standard:

03 If used, the In-Street Pedestrian Crossing sign shall be placed in the roadway at the crosswalk location on the center line, on a lane line, or on a median island. The In-Street Pedestrian Crossing sign shall not be post-mounted on the left-hand or right-hand side of the roadway.

04 If used, the Overhead Pedestrian Crossing sign shall be placed over the roadway at the crosswalk location.

05 An In-Street or Overhead Pedestrian Crossing sign shall not be placed in advance of the crosswalk to educate road users about the State law prior to reaching the crosswalk, nor shall it be installed as an educational display that is not near any crosswalk.

Guidance:

06 If an island (see [Chapter 3I](#)) is available, the In-Street Pedestrian Crossing sign, if used, should be placed on the island.

Option:

07 If a Pedestrian Crossing (W11-2) warning sign is used in combination with an In-Street or an Overhead Pedestrian Crossing sign, the W11-2 sign with a diagonal downward pointing arrow (W16-7P) plaque may be post-mounted on the right-hand side of the roadway at the crosswalk location.

Standard:

08 The In-Street Pedestrian Crossing sign and the Overhead Pedestrian Crossing sign shall not be used at signalized locations.

09 **DELETED:** Applies only to R1-6a and R1-9a signs

10 The In-Street Pedestrian Crossing sign shall have a black legend (except for the red YIELD sign symbols) and border on a white background, surrounded by an outer yellow or fluorescent yellow-green background area (see [Figure 2B-2](#)). The Overhead Pedestrian Crossing sign shall have a black legend and border on a yellow or fluorescent yellow-green background at the top of the sign and a black legend and border on a white background at the bottom of the sign (see [Figure 2B-2](#)).

11 Unless the In-Street Pedestrian Crossing sign is placed on a physical island, the sign support shall be designed to bend over and then bounce back to its normal vertical position when struck by a vehicle.

Support:

12 The Provisions of [Section 2A.18](#) concerning mounting height are not applicable for the In-Street Pedestrian Crossing sign.

Standard:

13 The top of an In-Street Pedestrian Crossing sign shall be a maximum of 4 feet above the pavement surface. The top of an In-Street Pedestrian Crossing sign placed in an island shall be a maximum of 4 feet above the island surface.

Option:

14 The In-Street Pedestrian Crossing sign may be used seasonably to prevent damage in winter because of plowing operations, and may be removed at night if the pedestrian activity at night is minimal.

15 In-Street Pedestrian Crossing signs, Overhead Pedestrian Crossing signs, and Yield Here To Pedestrians signs may be used together at the same crosswalk.

**SUBJECT: IN-STREET AND OVERHEAD PEDESTRIAN CROSSING SIGNS**

The MUTCD website has a Frequently Asked Question (FAQ) section and one of the questions deals with the placement of the R1-5 and R1-6 signs. The following provides additional clarification.

Q: Can a R1-5 YIELD HERE TO PEDESTRIANS sign be placed at a pedestrian crosswalk under the Pedestrian Crossing W11-2 warning sign?

A: No, the R1-5 YIELD HERE TO PEDESTRIANS sign is for application with an advance yield line in advance of an unsignalized midblock crosswalk, to decrease the sight obstruction caused by vehicles in adjacent lanes. The R1-5 sign is not for use at the midblock crosswalk itself. The W11-2 Pedestrian Crossing warning sign with downward sloping arrow plaque (W16-7P) used at the crosswalk is a supplement to the advance placement of the Pedestrian Crossing warning sign. An R1-6 In-Street Pedestrian Crossing sign may be installed in the roadway on centerline of the road at such a crosswalk, whether it is at an intersection or midblock, but the R1-6 sign cannot be installed out of the street at the roadside.

In addition to the information provided in Section 2B.12 of the MUTCD and State Supplement, the following Office of Traffic Safety & Mobility Departmental policies also apply:

Office of Traffic Safety & Mobility Policy:**General**

1. The legend STATE LAW shall be displayed at the top of the R1-6 and R1-9 signs.
2. On State highways, the purchase, deployment, removal and maintenance of the R1-6 sign shall be the responsibility of the municipality. Permission to install and maintain the device shall be authorized through a Highway Work Permit. A permit is valid for five years and is renewable.
3. If the Office of Traffic Safety & Mobility recommends the installation of an Overhead Pedestrian sign (R1-9), then the installation and maintenance shall be the responsibility of the Department.
4. The Department may purchase R1-6 signs for its own use. In addition, it may also temporarily loan a R1-6 sign to a municipality. If such a loan occurs, a signed release (see Appendix) shall be completed. In the event that an In-Street Pedestrian Crossing Sign is involved in an accident that results in bodily and/or personal injury, the release is used to indemnify and hold the State/ Department harmless.

Material

1. The design detail for the R1-6 sign shall conform to the specifications found in the Standard Highway Sign book. See Appendix.
2. The R1-6 sign shall be made of a flexible reflectorized material using ASTM Type III or higher retroreflective sheeting.
3. The base of the R1-6 sign shall not exceed a width of more than 18".
4. The sign support shall comply with the breakaway requirements of the latest edition of AASHTO's Specification for Structural Supports for Highway Signs, Luminaires, and Traffic Signals.



SUBJECT: IN-STREET AND OVERHEAD PEDESTRIAN CROSSING SIGNS

Location

1. The sign should be removable for seasonal (snow removal) or other maintenance purposes. If the device is attached to the pavement, it should be done using a removable sleeve, lag screws, epoxy, etc. Signs should not be displayed between November 15th and April 1st in Downstate Regions (8, 10 & 11) and November 1st and April 15th in Upstate Regions (1, 2, 3, 4, 5, 6, 7 & 9).
2. The device should not be placed on highways with a speed limit greater than 30 MPH. The sign may be used in work zones provided that the work zone speed limit shall not exceed 30 MPH.
3. If used on a one way street, the In-Street Pedestrian Crossing sign shall be placed in the roadway at the crosswalk location on a lane line or on a median island.
4. Where used, the STATE LAW YIELD TO PED IN CROSSWALK (NYR9-7) sign should be placed on the right side of the roadway in advance of the crosswalk. It may also be placed on the left side of one-way roadways.

SUMMARY: New York implemented one of the first in-street pedestrian sign programs in the country in 1996 and has been a leader in advocating its use. Studies have shown that where the sign is used, compliance rates for yielding or stopping for pedestrians are significantly higher than at unsigned locations. While not a complete panacea, the device offers another tool for improving pedestrian safety.

Over the years, the design and look of the sign has changed with the eventual adoption of the sign in the 2003 MUTCD. In addition to the guidance provided in the MUTCD, the Department has developed and applied criteria for determining the applicability of In-Street Pedestrian Crossing signs. Together with the National guidance, users of the devices have sufficient information in terms of guidelines and responsibility for the installation, operation and maintenance of In-Street and Overhead Pedestrian Crossing signs on State highways.

REFERENCES:

Manual on Uniform Traffic Control Devices (MUTCD) - 2009 edition

<http://mutcd.fhwa.dot.gov/>

17 NYCRR Chapter V (New York Supplement), March 2011

<https://www.dot.ny.gov/divisions/operating/oom/transportation-systems/repository/B-2011Supplement-adopted.pdf>

TED 05-002, Supplementary Pedestrian Crossing Channelization Devices & In-Street Pedestrian Crossing Signs

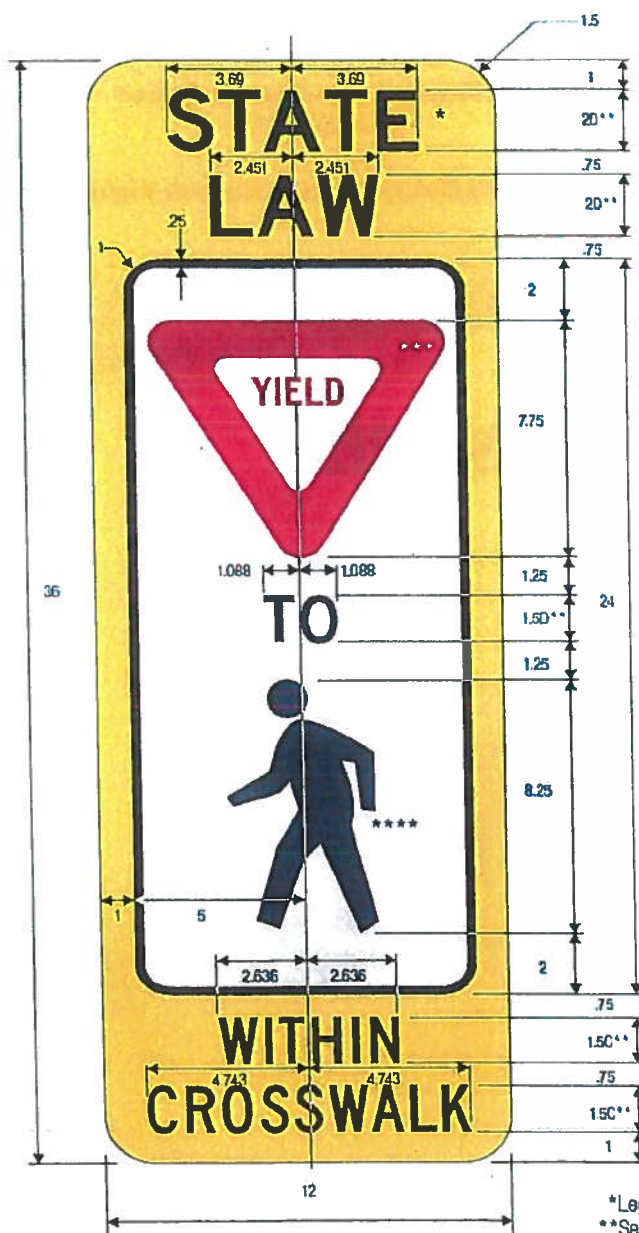
http://axim22.nysdot.private:7779/portal/page?_pageid=39,401034,39_3875804&_dad=portal&_schema=PORTAL

Supplementary Pedestrian Crossing Channelization Devices – Final Guidelines, memorandum by T.C. Werner, Traffic/Planning Division, December 2, 1996

CONTACT: Direct questions regarding this issuance to the Office of Traffic Safety & Mobility, Operations Bureau at (518) 457-1793.

SUBJECT: IN-STREET AND OVERHEAD PEDESTRIAN CROSSING SIGNS

APPENDIX



R1-6
IN-STREET PEDESTRIAN CROSSING

*Legend is optional.
**Series 2000 Standard Alphabets.
***Insert R1-2 and size to fit.
****See 6-10 for design detail.

COLORS: LEGEND — BLACK
BACKGROUND — FLUORESCENT YELLOW-GREEN, OR YELLOW (RETROREFLECTIVE)
YIELD SYMBOL — RED (RETROREFLECTIVE) ON WHITE (RETROREFLECTIVE)
PED SYMBOL — BLACK ON WHITE (RETROREFLECTIVE)



SUBJECT: IN-STREET AND OVERHEAD PEDESTRIAN CROSSING SIGNS

APPENDIX – continued

Overhead Pedestrian Crossing Sign

**US Route 11 @ Webster Street
Malone, NY**

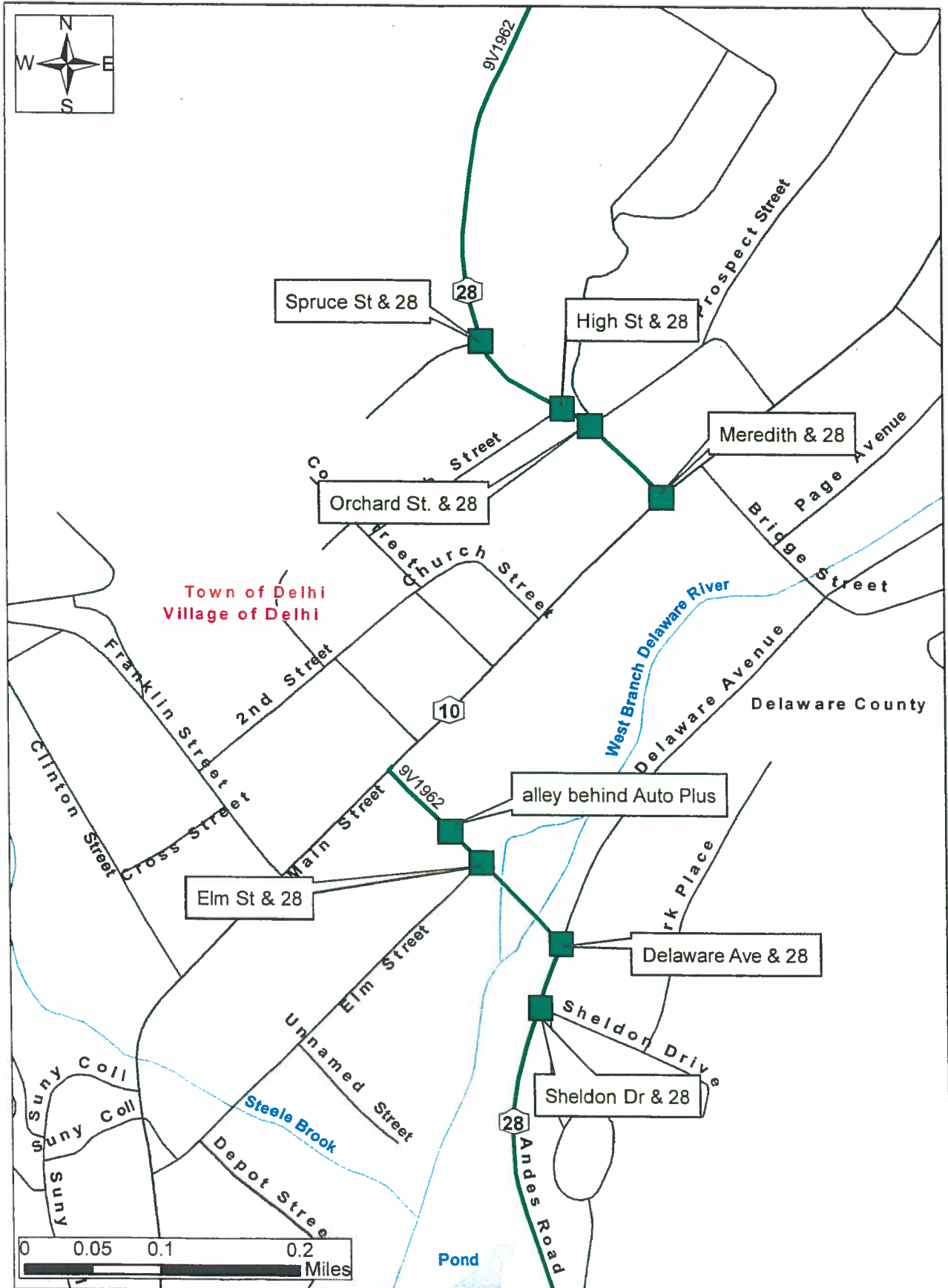
Photo Courtesy of Josy Delaney of the Malone Complete Streets Advisory Board



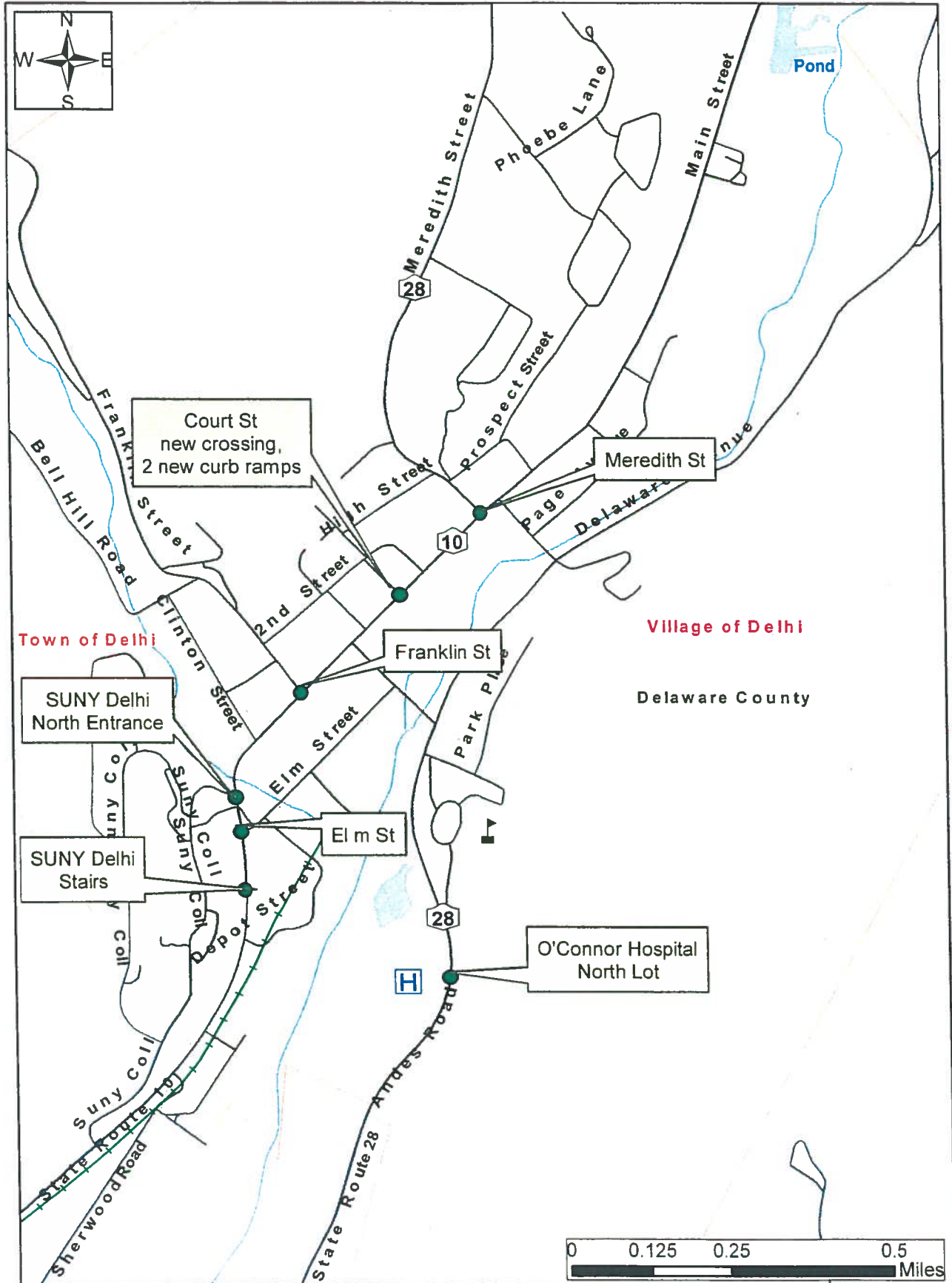
**Complete Streets: Improving Safety &
Access for All**

9V1962 - Delhi Paving Project

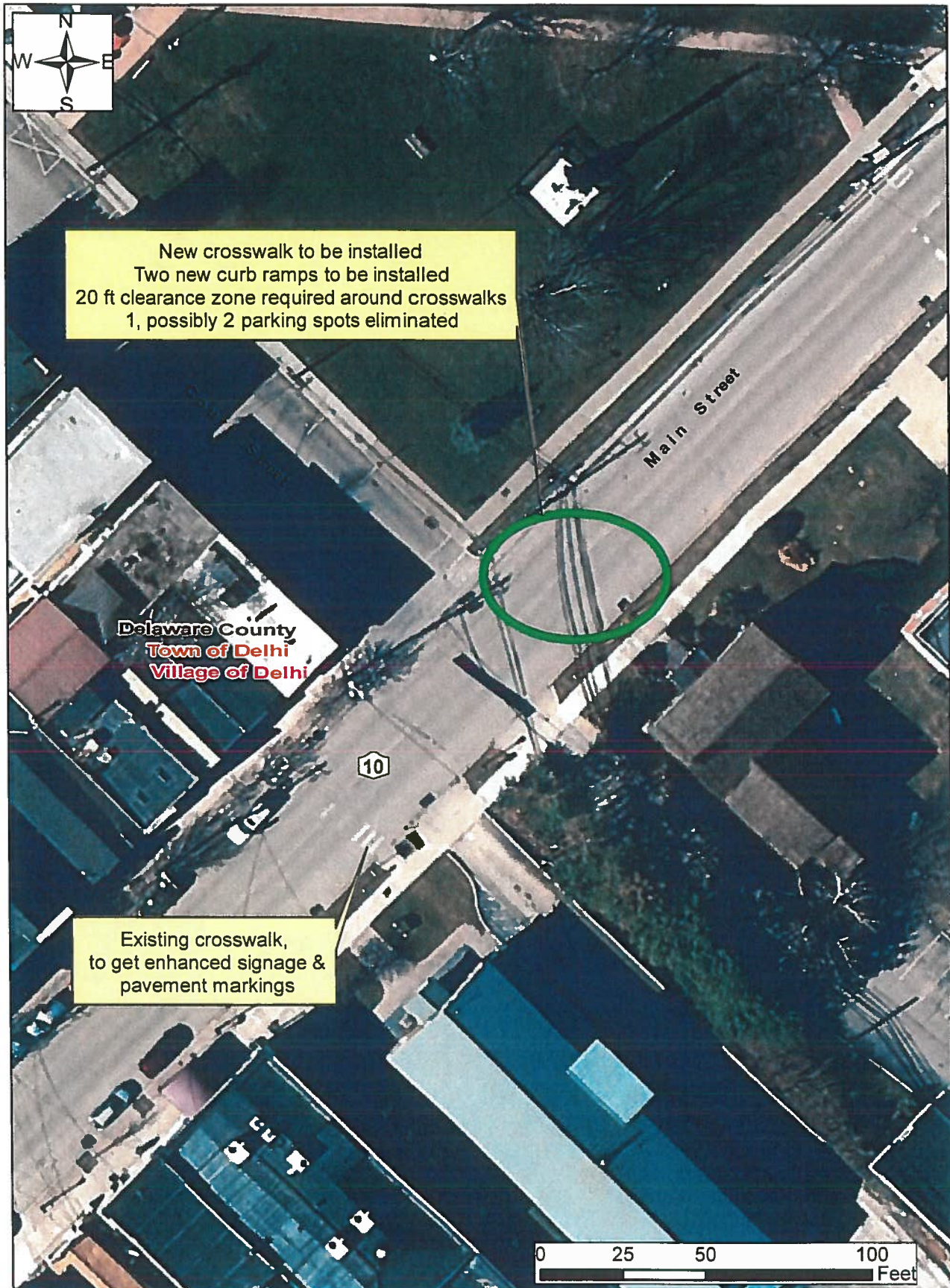
Ramps that will be repaired to meet ADA Standards



Enhanced Crosswalk Locations Pedestrian Safety Action Plan (PSAP)



Court Street - additional crosswalk



Meredith Street Crosswalk





\$2,000 To construct as Todd Park

Sunny Delhi -- Max-restaurant

12/6 @ 2pm O'Connor Hosp.

Complete Streets Meeting

Date: October 4, 2018

Attended: Amy Beveridge (O'Connor Hospital), Macy Wilbur (O'Connor Hospital), Everett Farrell (Planning Dept), Sean Leddy (Planning Dept), Spencer Devaul (Planning Dept), Evan Heaney (Population Health Improvement Program), Jeanne Darling (Cornell Cooperative Extension), Heather Warner (Public Health) Excused: Rick Roberts (Catskill Mountain Club), Chelsea Steffens (Community Member), Maureen Blanchard (Creating Healthy Schools and Communities), Art Merrill (Town of Colchester)

TOPIC	DISCUSSION	CONCLUSION
<u>MINUTES:</u>		
Map Project <i>95% complete.</i>	Spencer presented the finished result of the maps. The maps are consistent with the prescription trail grades 1,2, and 3 color schemes (green, blue, and orange)	Spencer will need the routes either by GPS (this is the best) or an explained description of the route. Once Spencer gets the description of the route, he then can create a map for it.
Walton:	Breaking ground soon on Water Street.	Amy to follow up with tails from the Catskill Mountain Club.
Grant	O'Connor has grant money \$5,000 that needs to be spent by December.	Ideas were brought up about printing maps, and potential fitness stations by the new pool at the legion. To follow up with Jane Tweed and Bill Cairns.
<i>Jamie-Coop Ed.</i>	Respectfully submitted, Macy Wilbur <i>Rick, Maureen, Heather</i>	
	<i>Rick</i>	



DELAWARE COUNTY DEPARTMENT OF PLANNING AND WATERSHED AFFAIRS

Highway Department Building • P.O. Box 367 • Delhi, New York 13753
Phone (607) 832-5444 • Fax (607) 832-6070 • Email: pln@co.delaware.ny.us

Village of Fleischmanns

- Village Ball Park : *Grade 1*
- Village Ball Park – Choice A : *Grade 1*
- Village Ball Park Loop : *Grade 1*

Village of Margaretville

- Country Route Walk : *Grade 2*
- Kennedy Heights Walk : *Grade 2*
- School Walk : *Grade 1*
- Village Park Trail : *Grade 1*
- Village Walk : *Grade 2*

Village of Sidney

- Civic Center Loop : *Grade 1*
- Tri-Town Regional Loop : *Grade 1*

Village of Walton

- Griswold Loop : *Grade 1*
- High School Loop : *Grade 1*



DELAWARE COUNTY DEPARTMENT OF PLANNING AND WATERSHED AFFAIRS

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The following is a list of maps completed for the complete street project.

Town of Andes

- Andes Cemetery Trail : *Grade 1*
- Andes Rail Trail – Bullet Hole Spur : *Grade 2*
- Andes Rail Trail : *Grade 1*
- Ballantine Park *Grade 2*
- Main Street Walk : *Grade 1*
- Palmer Hill Loop 2 : *Grade 2*
- Palmer Hill – Ruff Loop : *Grade 2*
- Palmer Hill : *Grade 2*
- Shavertown Trail Pond : *Grade 3*

Town of Walton

- Bear Spring Mountain Trails : *Grade 3*

Village of Delhi

- Bulldog Run Trail : *Grade 3*
- Court House Script Trail : *Grade 1*
- Courthouse Square Loop : *Grade 1*
- Delhi Covered Bridge Run Trail : *Grade 2*
- Delhi Hiking Trail : *Grade 3*
- Sheldon Drive Trail : *Grade 1*
- SUNY Delhi Loop Trail : *Grade 2*
- The Grinbley Trail : *Grade 3*

Village of Franklin

- School Loop : *Grade 1*

The Gribble Trail Script Trail Grade 3 Trail Village of Delhi

Grade 3 - Most Challenging Most - Remote

Changes in surface, grade and slope throughout trail.
May not be near other trails, roads and/or near
villages hamlets.

The Gribble Trail - Script Trail

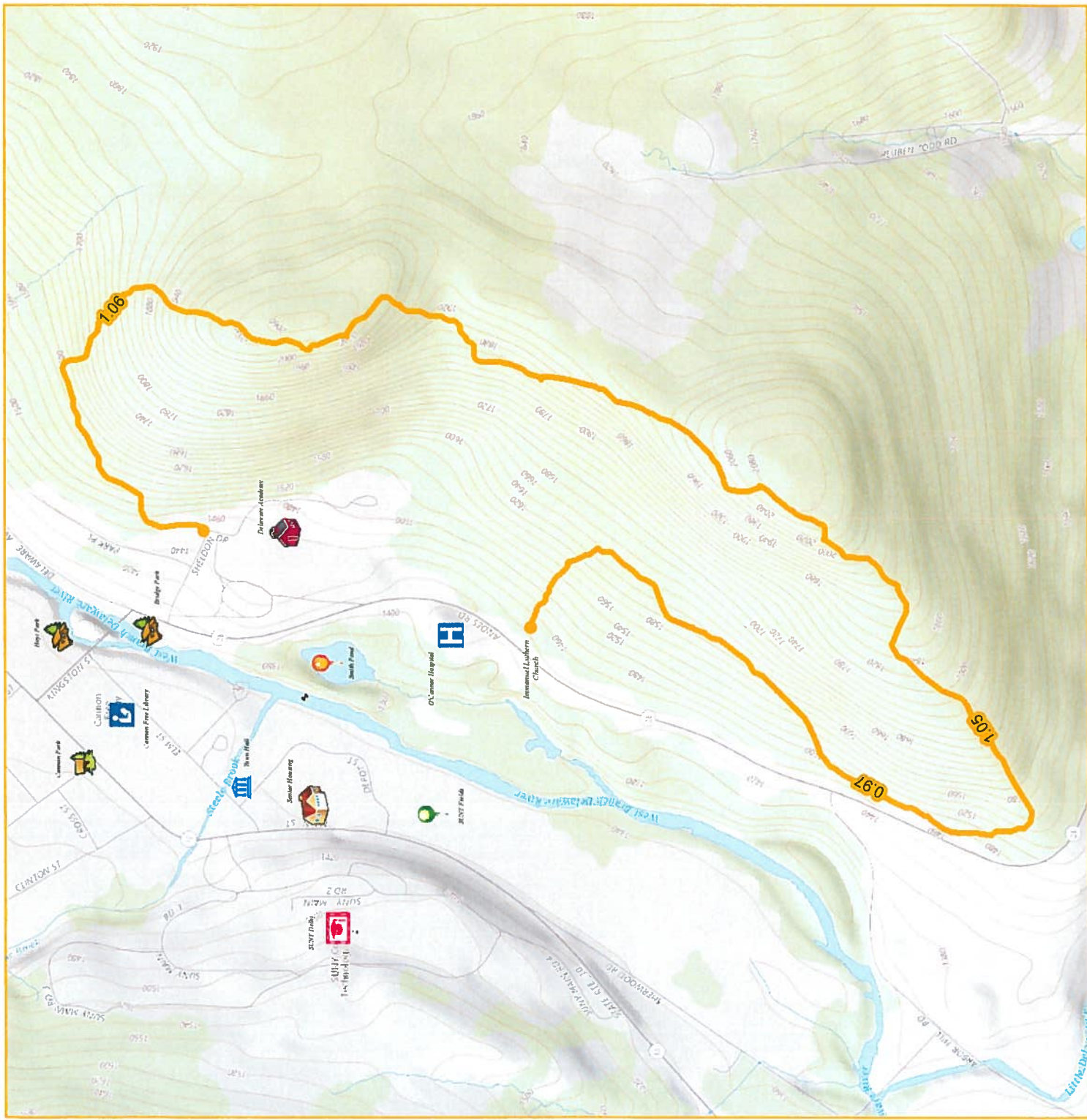
The Gribble Trail is a 3.08 mile route
that starts at the Sheldon Park Trailhead
on Sheldon Drive in downtown Delhi.
After a steep climb the trail passes through
varied vegetation, offering views of the
village, then descends to meet the Bulldog
Run Trail and ends at the Immanuel Lutheran
Church Trailhead. 3.08 miles

Legend

- Bridge Park
- Cannon Free Library
- Cannon Park
- County Office Building
- Courthouse Square
- Delaware Academy
- Fire Station
- Hoyt Park
- Legion Park
- O'Connor Hospital
- Playground
- SUNY Delhi
- SUNY Fields
- Senior Housing
- Smith Pond
- Town Hall
- US Post Office
- Village Hall
- Woodland Cemetery



Scale: 1" = 1,000'



Village Ball Park Loop



Script Trail

Grade 1 Trail

Village of Fleischmanns

Grade 1 - Accessible to Most Users

Non - Remote

Mainly flat and free of debris. Mostly located in village or hamlets. Often paved, concrete surfaces that are mostly flat with some grassy areas.

Village Ball Park Loop



Start at the entrance of the Village Ball Park and walk down Wagner Avenue to the intersection of Depot Street. Turn around and walk back to the starting point. 0.6 miles

Start at the starting point and now you have a choice.

Start at the starting point and go right up Wagner Avenue to the corner of Main Street. Turn left onto Main Street and walk through the village, down main to the corner of Depot Street, cross the bridge and then turn left again back onto Wagner Avenue and back to starting point. 1.5 miles

Legend



Fire Department



Skene Memorial Library



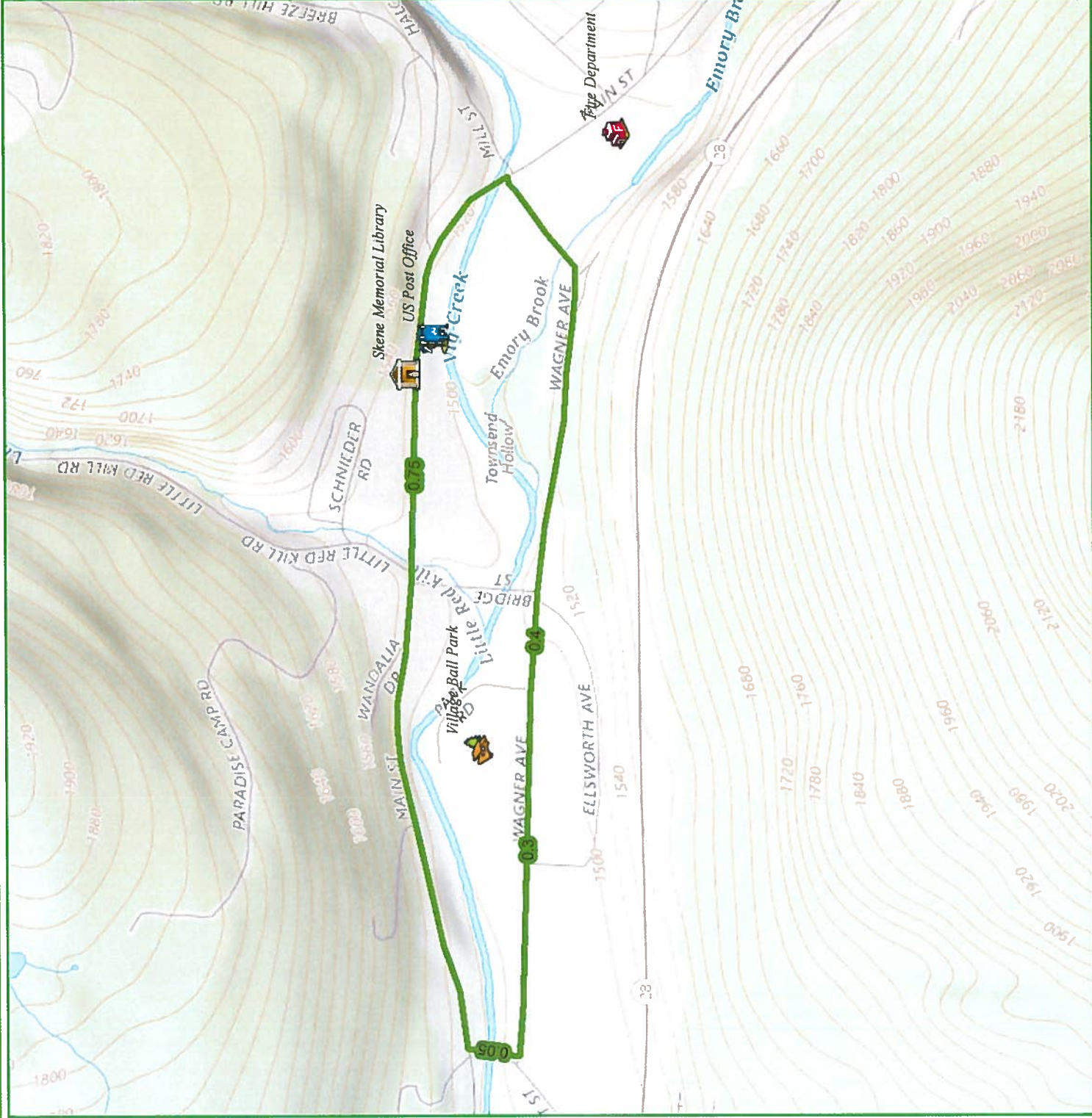
US Post Office



Village Ball Park



Scale: 1" = 600'



Palmer Hill Loop 2

Script Trail

Grade 2 Trail

Town of Andes

Grade 2 - Slightly Challenging
Semi - Remote

Paved, crushed stone, packed dirt with possible grade changes. Surface changes could include sidewalks, edge of road, and grass pathways.

Palmer Hill Loop 2

Partway to Homestead Intersection. Walk out the first quarter mile of the Palmer Hill Trail, starting at the scenic overlook. Look at the distant peaks of the Catskill Park as you do this flat portion of the trail.



Palmer Hill Loop 2 - You can also walk more of the lower portion of this trail to stay on the section. 1.1 miles (plus the 1 mile RT Homestead portion)

Legend

-  Andes Cemetery
-  Andes Rural Cemetery
-  Andes Fire Department
-  Andes School
-  Ballantine Park
-  Post Office



Scale: 1" = 700'

