

Enhancement Criteria for Uncontrolled Pedestrian Crossing Locations

This guidance is intended for pedestrian crossings at locations where no traffic control is present, such as locations without a stop sign, signal, or roundabout. Application of this guidance may be used for uncontrolled bicyclist crossings, controlled intersections or crossings, or designated school zones, but additional considerations or requirements may apply.

Legal crosswalks exist at all intersections, whether marked or not, per [RCW 46.04.160](#). Given the large number of legal crosswalks, and the responsibility to keep the traffic control device(s) legible, visible, and functional per [Manual on Uniform Traffic Control Devices](#) (MUTCD) 1A.05, any additional enhancement, including marking the crosswalk, must be installed with purpose and a defined need to ensure their effectiveness. Enhanced crossings alert motorists to the presence of a pedestrian or potential for a pedestrian, as well as help direct pedestrians to the preferred crossing location.

An engineering study is used to determine whether a crosswalk should be marked and if additional treatments are needed. The engineering study should assess the pedestrian/bicyclist need at the location, as well as the suitability of the location based on roadway, traffic, and adjacent land use characteristics. The first step of the engineering study is to use the following to determine crossing need:

- Pedestrian/bicyclist crash history severity and frequency
- Pedestrian/bicyclist volumes
- Known pedestrian/bicyclist crossing activity in dark or night time conditions
- Proximity to adjacent enhanced crossings
- Proximity to transit stops, trails/shared-use paths, or other pedestrian/bicyclist generators (employment centers, schools, parks, restaurants, bars, businesses, health services, etc.)
- Land use context and future land use changes, growth, or development patterns
- Demographics of the population within the walk shed of the location (give special consideration in communities where there are higher numbers of people over 65 and people with disabilities¹)
- Pedestrian/bicyclist delay or suitability of gaps
- Consistency with local agency plans that include the location as a part of their pedestrian/bicycle network

The second step of the engineering study is to evaluate the crossing based on the following roadway and traffic characteristics. These characteristics relate to either the guidance in Table 1 or to minimum requirements for crossing enhancement.

- Traffic volumes (ADT)
- Posted speed
- Number of lanes (total and number that would need to be crossed consecutively without an intermediate pedestrian refuge)
- Presence of median
- Motorist and pedestrian sight distance
- Proximity to nearby enhanced crossings
- ADA compliance of existing features
- Illumination
- Presence of on-street parking

¹ EJSCREEN: Environmental Justice Screening and Mapping Tool. (2017, August 17). <https://www.epa.gov/ejscreen>

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The following requirements must be met for further crossing enhancement consideration:

- Adequate sight distance, equal to or exceeding the stopping sight distance for the posted speed, is available in both directions. Decision sight distance must be met, however, for locations where the crossing is not reasonably expected. In accordance with [RCW 46.61.570](#), on-street parking is restricted within 20 feet of a crosswalk. Additional roadside parking restrictions may be required if sight distance is limited, see procedures in [Traffic Manual](#) 6.3(G).
- Pedestrian activity or land use context supports a marked crosswalk.

The pedestrian crossing enhancement guidelines shown in Table 1 are applicable for locations that are not controlled by a signal, roundabout, or stop sign. Any implementation of a marked crosswalk at an uncontrolled location shall require approval from the Region Traffic Engineer or designee. Mid-block crosswalk installations require pedestrian warning signs and stop lines per the [IS-23 Pedestrian Crossing Details](#).

Table 1. Pedestrian Crossing Enhancement Guidance

| Traffic Volume (ADT) | Posted Speed | Roadway Configuration, Two-Directional ¹ | | | | |
|----------------------|--------------|---|--|--------------------------------|---|--|
| | | 2 lanes | 2-3 lanes, with raised median ² | 3 lanes, without raised median | ≥4 lanes, with raised median ^{2,3} | ≥4 lanes, without raised median ³ |
| < 9,000 | ≤ 30 mph | A | A | A | A | A |
| | 35 mph | A | B | B | B | C |
| | ≥ 40 mph | C | C | C | C | C |
| 9,000-15,000 | ≤ 30 mph | A | A | A | B | B |
| | 35 mph | B | B | B | B | C |
| | ≥ 40 mph | C | C | C | C | C |
| ≥ 15,000 | ≤ 30 mph | B | B | C | C | C |
| | 35 mph | B | B | C | C | C |
| | ≥ 40 mph | C | C | C | C | C |

¹Roadway configuration includes all lanes at crossing location

²Raised median must meet accessibility criteria as stated in [Design Manual](#) 1510.11(1)

³The installation of a midblock crosswalk on a roadway with two or more through lanes in one direction requires a stop line placed 20 to 50 ft in advance of the crosswalk. See [MUTCD](#) 3B.16 for guidance.

Based on an identified need to enhance the crossing from the engineering study,

- A. Location may be suitable for marked crosswalk with no or minimal additional enhancement.
- B. Location suitable for marked crosswalk, additional enhancement recommended.
- C. Marked crosswalks alone are insufficient, additional enhancement is required.

Additional pedestrian crossing enhancements may include, but are not limited to, the following enhancements. Enhancement selection is based on the preceding roadway and traffic characteristics, as well as additional factors relevant for each location (e.g. percentage of truck traffic). Traffic operational analysis may also be necessary to evaluate the appropriateness of enhancements at each location.

- Pedestrian scaled illumination (consideration for height and location)
- Pedestrian warning sign, at the crosswalk location and/or advanced (see [Traffic Manual](#) 2.8)
- Advanced pedestrian warning sign
- Stop line placed 20 to 50 ft in advance of the crosswalk
- Tighter turning radii

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- In-street pedestrian crossing sign (in conjunction with refuge islands)
- Pedestrian crossing flags within incorporated cities (in coordination with local agency sponsorship)
- Pedestrian refuge island (subject to requirements in [Design Manual](#) 1510.11(1))
- Raised crosswalk
- Rapid flashing beacons (RFB) or warning beacons (subject to requirements in [MUTCD](#) 4L)
- Pedestrian hybrid beacon (PHB) (subject to requirements in [MUTCD](#) 4F)
- Pedestrian signal
- Curb extension
- Traffic-calming treatments
- Roadway narrowing or road diet

The selection of any crossing enhancements, including pavement markings, signs, or other features, at an uncontrolled location shall require the approval of the Region Traffic Engineer or designee.

Appendix: WSDOT Interim Guidance for Supplemental Treatments for Marked Pedestrian Crossings

References:

1. Blackburn, L., Zegeer, C., & Brookshire, K. (2017). Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations (FHWA-SA-17-072).
2. Zegeer, C. V., Stewart, J. R., Huang, H. H., Lagerwey, P. A., Feaganes, J., & Campbell, B. (2005). Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations (HRT-04-100).
3. Fitzpatrick, K., et al. (2006). Improving Pedestrian Safety at Unsignalized Crossings (TCRP Report 112/NCHRP Report 562).
4. Guidance for Installation of Pedestrian Crosswalks on Minnesota State Highways. (2005). Minnesota Department of Transportation.
5. Schroeder, B. J., O'Brien, S. W., & Findley, D. J. (2015). North Carolina Pedestrian Crossing Guidance (FHWA/NC/2014-15).
6. Pedestrian Crossing Accommodations at Unsignalized Locations (IIM-TE-384.0). (2016). Virginia Department of Transportation.

WSDOT Interim Guidance for Supplemental Treatments for Marked Pedestrian Crossings

Rapid Flashing Beacons (RFBs) and/or LED Circular Beacons are used to supplement pavement markings and pedestrian warning signs for a marked crossing. The decision to use a marked crossing shall be based on an engineering study and have been approved by the Region Traffic Engineer. The installation of RFBs is not acceptable mitigation to justify the approval of a mid-block pedestrian crossing. RFBs shall be pedestrian activated. This guidance describes locations where RFBs should be used to enhance pedestrian crossings at mid-block crosswalks or unsignalized intersections, and how RFBs should be arranged when they are used.

When to Use RFBs

Table 1 below describes the conditions under which RFBs, alternate beacons, and advance circular beacons should be used. Installation on roadways with a posted speed greater than 40 MPH requires an engineering analysis and approval from the Region Traffic Engineer.

Table 1: Use of Beacons by Roadway Configuration

| Roadway Type | Posted Speed Limit (MPH) | RFB / Alternate Beacon at Crossing | Advance Circular Beacons ^[2] |
|--|--------------------------|------------------------------------|---|
| Two or More Lanes in Each Direction, with Raised Median or Pedestrian Refuge | ≥ 40 | Required | Optional |
| | 35 | Optional ^[1] | Optional |
| | ≤ 30 | Not Required | Not Required |
| Two-Way – Two Lane or Three Lane (with Two-Way Left Turn Lane or Median) | ≥ 40 | Required | Optional |
| | 35 | Optional | Optional |
| | ≤ 30 | Not Required | Not Required |
| One Way – Two or More Lanes | ≥ 40 | Required | Optional |
| | 35 | Optional ^[1] | Optional |
| | ≤ 30 | Not Required | Not Required |
| Roundabouts | N/A | Contact HQ Traffic Office | |

[1]: ADT should be considered as part of the decision for this location type.

[2]: Advance beacons are required for any RFB / Alternate Beacon System when sight distance is not met for the beacons at the crossing.

At any location type marked as “Optional” or “Not Required”, RFBs or Alternate Beacons may be installed by the local jurisdiction, but the local jurisdiction is responsible for all costs and materials for installation, maintenance, and repairs. An engineering study by WSDOT is not required for systems installed by the local jurisdiction.

WSDOT Interim Guidance for Supplemental Treatments for Marked Pedestrian Crossings

Beacon System Placement

The locations of the primary and advance beacons varies with the configuration of the roadway.

1. Beacons shall be placed as shown in the IS-23 details (available on the IS-22 web page at <http://www.wsdot.wa.gov/Design/Standards/PlanSheet/IS-22.htm>).
2. Where Advance Circular Beacons are installed due to inadequate sight distance to the beacons at the crossing, they shall operate continuously. All other advance beacons shall be pedestrian activated with the beacons at the crossing.
3. Advance Circular Beacons, when used, shall use 8-inch displays for roadways with a posted speed limit of 35 MPH and 12-inch displays for roadways with a posted speed limit of 40 MPH or higher.

Table 2 shows where beacons are required to be located, based on the roadway configuration.

Table 2: Required Beacon Placement by Roadway Configuration

| Roadway Configuration | | | Required Placement | | | |
|-----------------------|----------------------------------|-------------------------------|--------------------|---------------|-----------------------|----------|
| Traffic Direction | Number of Lanes in One Direction | Median ^[1] Present | Right Shoulder | Left Shoulder | Median ^[1] | Overhead |
| One-Way | Two | N/A | X | X | | |
| | Three | N/A | X | X | | X |
| Two-Way | One | N/A | X | X | | |
| | Two | Yes | X | | X | |
| | | No | X | | | X |
| | Three or More | Yes | X | | X | X |
| No | | X | | | X | |
| Roundabout Approach | Two | N/A | X | [2] | X ^[2] | |
| | Three | N/A | X | [2] | X ^[2] | X |

[1]: Median includes open medians, median islands, pedestrian refuge islands, and roundabout approach splitter islands.

[2]: For one-way roundabout approaches, the left side beacon shall be installed on the left shoulder, since no splitter island is present.