DOWL

MLCT 2017 September 27-29 GREAT FALLS

Today's Challenges - Tomorrow's Opportunities

Best Western Heritage Inn
1600 Fox Farm Road

PEDESTRIAN CROSSING TREATMENTS

BEST PRACTICES

Presented by:

Doug Enderson, P.E., PTOE
Cody Salo, P.E.

PRESENTER **INTRODUCTIONS**

Doug Enderson, P.E., PTOE

Ped Crossing Experience:

- ADA Design-Build
- ADA Inventory & Retrofit
- RRFB
- HAWK
- Equestrian Signal Design
- Accessible Signal Upgrades
- Bulb-Outs
- Shared Use Paths

Cody Salo, P.E.

Ped Crossing Experience:

- RRFB
- HAWK
- Accessible Signal Upgrades
- ADA Transition Plans
- Pedestrian Bridges
- Bulb-Outs
- ADA Training
- Shared Use Paths

THE **AGENDA**

1. Regulations & Policies
2. Pedestrian Crossing Elements
3. Crossing Treatments
4. Funding Options
5. Questions

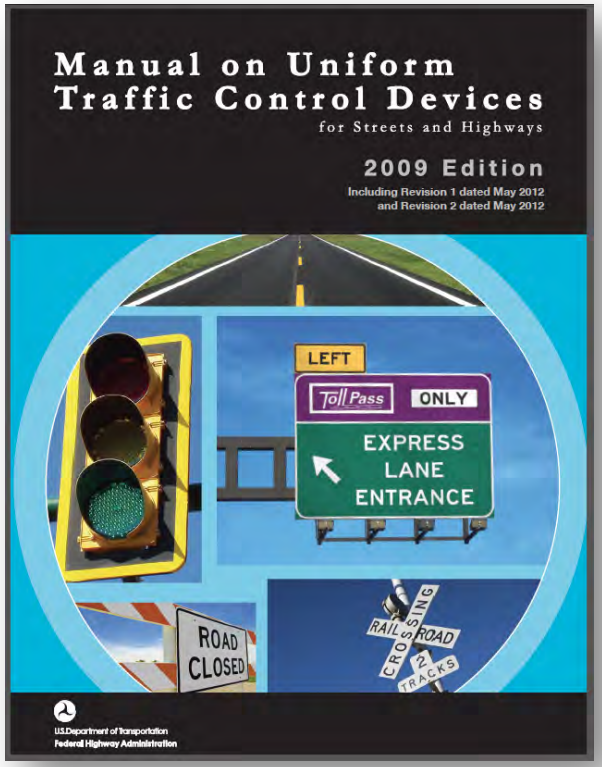
DISCLAIMER

IMAGES, PROJECTS, and EXAMPLES have been sourced from many various locations/entities. WE ARE NOT CLAIMING THESE AS OUR OWN!

REGULATIONS & **POLICY**

Manual on Uniform Traffic Control Devices (MUTCD)

- National standards governing all traffic control devices
- Two revisions accepted in 2012
- Ensures uniformity of TC devices



REGULATIONS & **POLICY**

Americans with Disabilities Act (ADA) 1990

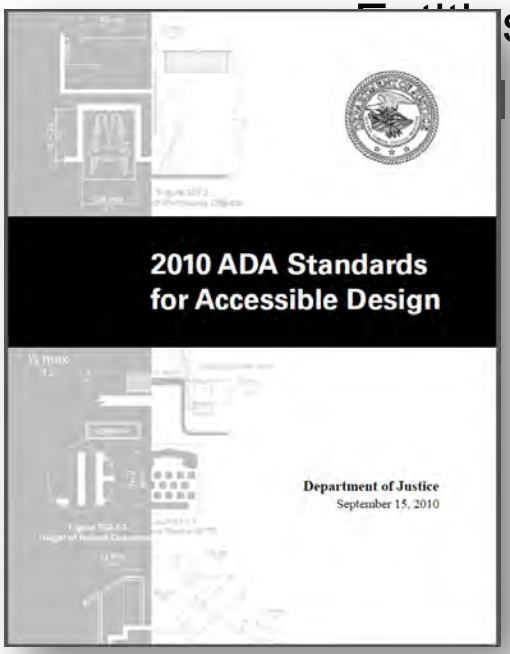
- Prohibits discrimination on the basis of disability by public entities (Title II).

- All publicly-owned intersections/facilities must comply with:

❑ Americans with Disabilities Act Accessibility Guidelines (ADAAG) (Title III)

Entities may choose to comply with…

Public Rights-of-Way Accessibility Guidelines (PROWAG)



REGULATIONS & **POLICY**

A public entity shall:

"Evaluate its current services, policies,and practices, and the effects thereof, that do not or may not meet the requirements…Identify physical obstacles in the public entity's facilities that limit the accessibility of its program or activities to individuals with disabilities"

ADA Transition Planning

- **Provides baseline to document steps towards removal of barriers**

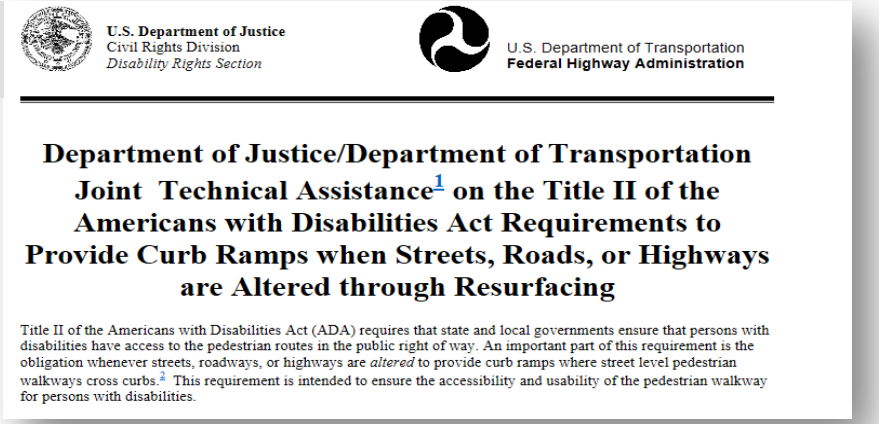
REGULATIONS & **POLICY**

Public Rights of Way Accessibility Guidelines (PROWAG) 2011

- United States Access Board created proposed guidelines
- Expands and clarifies ADA within context of the public right of way
- Access Board issued a notice in 2013 to include shared use paths
- PROWAG will be enforceable under Title II of the ADA when the Department of Justice adopts it

REGULATIONS & **POLICY**

In the meantime:



U.S. Department of Justice
Civil Rights Division
Disability Rights Section

U.S. Department of Transportation
Federal Highway Administration

Department of Justice/Department of Transportation Joint Technical Assistance[1] on the Title II of the Americans with Disabilities Act Requirements to Provide Curb Ramps when Streets, Roads, or Highways are Altered through Resurfacing

Title II of the Americans with Disabilities Act (ADA) requires that state and local governments ensure that persons with disabilities have access to the pedestrian routes in the public right of way. An important part of this requirement is the obligation whenever streets, roadways, or highways are *altered* to provide curb ramps where street level pedestrian walkways cross curbs.[2] This requirement is intended to ensure the accessibility and usability of the pedestrian walkway for persons with disabilities.

Department of Justice

- Alteration vs. Maintenance of Public Right of Way July 8, 2013 Notice

Alteration: change that affects or could affect the usability of all or part of a…facility.

Maintenance: potholes and seals.

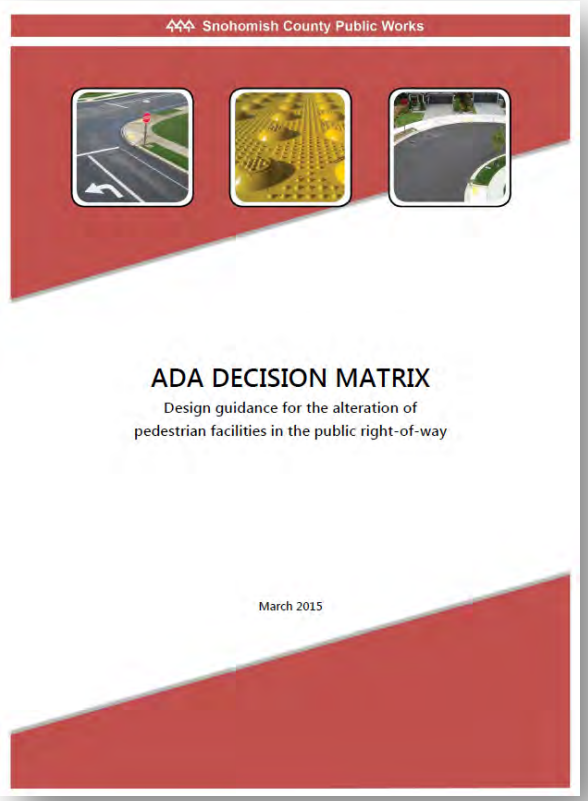
- Alterations trigger the obligation to provide curb ramps

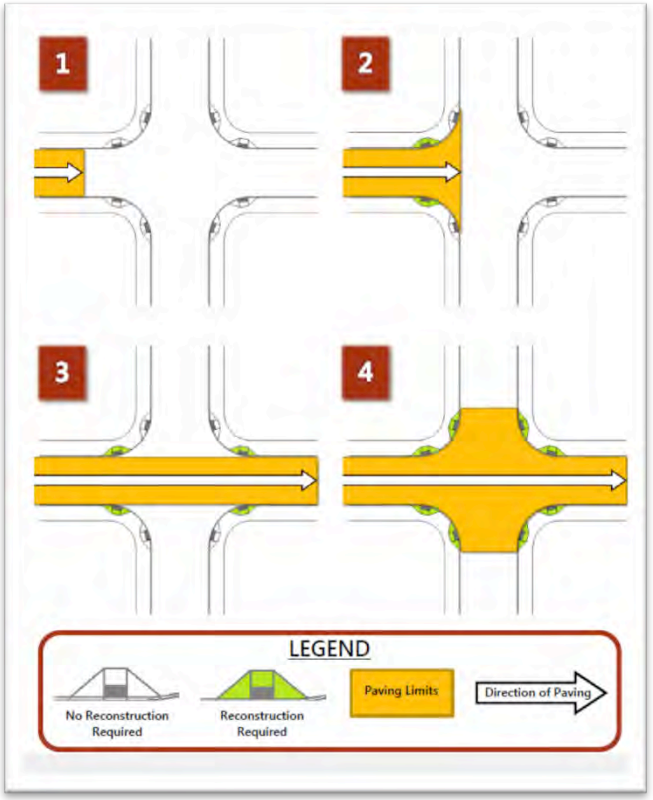
For more information:

https://www.ada.gov/doj-fhwa-ta.htm

REGULATIONS & **POLICY**

Snohomish County ADA Decision Matrix





Excellent guidance for alterations to existing facilities!

For more information:

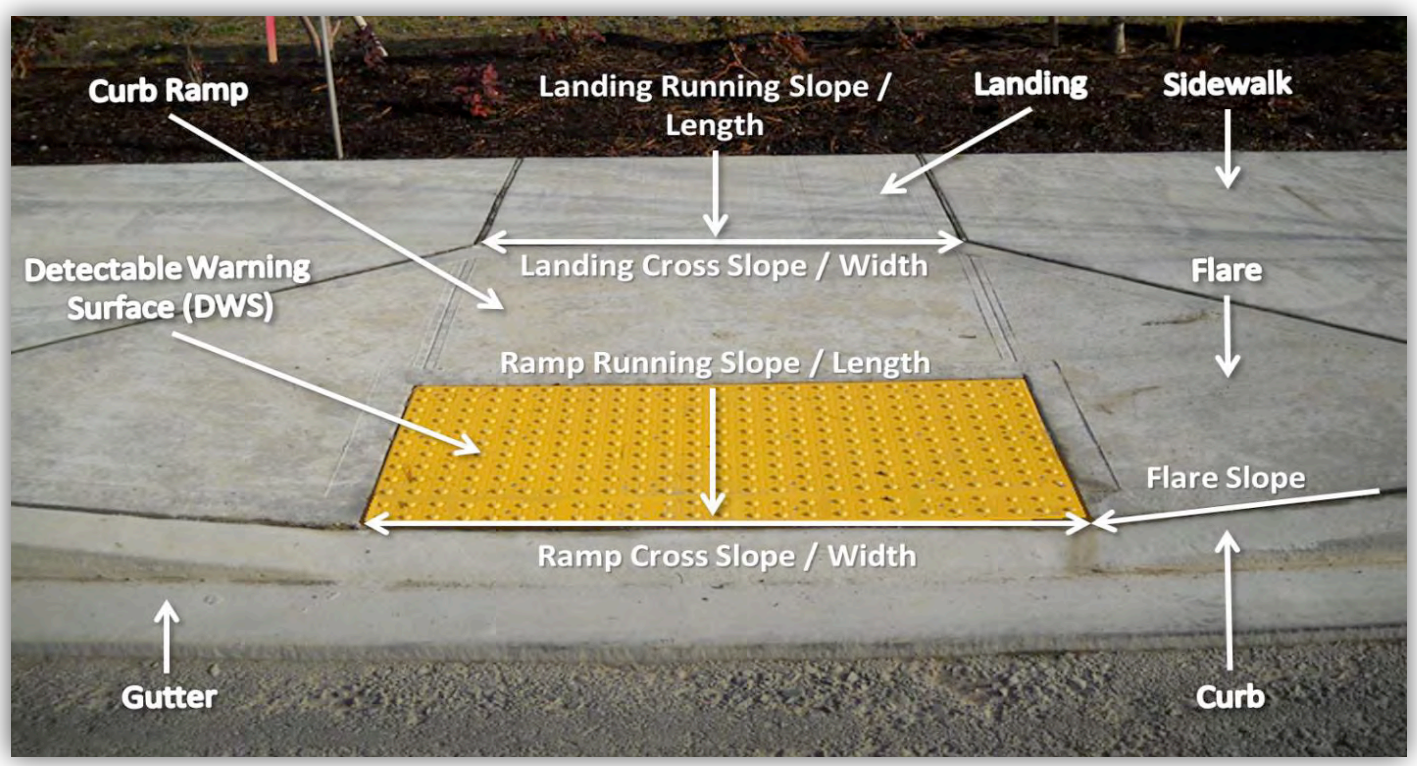
https://snohomishcountywa.gov/DocumentCenter/View/12189

PEDESTRIAN CROSSING **ELEMENTS**

Pedestrian Ramps

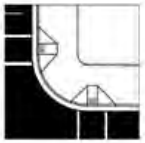
Elements:

- Landing
- Ramp
- Detectable Warning Device (DWD)



PEDESTRIAN CROSSING **ELEMENTS**

☐ Two Perpendicular Ramps



Two Perpendicular ramps can be installed where there is a small or large radius and standard sidewalk width.

☐ Two Parallel Ramps

Two Parallel ramps can be installed where the corner has a large radius and a narrow sidewalk width.

☐ Two Combination Ramps

Two Combination ramps (Perpendicular/Parallel) ramps can be installed on corners where there is a large radius and standard sidewalk width.

☐ Two Diagonal Perpendicular Ramps

Two Diagonal Perpendicular ramps can be installed on corners where there is a large radius and standard sidewalk width.

☐ One Diagonal Perpendicular Ramp

One Diagonal Perpendicular ramp can be installed on corners where there is a small radius and standard sidewalk width.

☐ One Diagonal Parallel Ramp

One Diagonal Parallel ramp can be installed on corners where there is a small radius and narrow sidewalk width.

Pedestrian Ramps

Ramp Types:

- Use Access Board's Guidelines for ramp type selection
- Designates preferred ramp types based on radii and available right of way
- Rule of thumb:

  Sidewalk is considered standard width if the sidewalk itself or the sidewalk plus the boulevard width is greater than 10 feet

PEDESTRIAN CROSSING **ELEMENTS**

Signing

- Warning Signs
- Regulatory Signs
- Guide (Way-Finding) Signs

Keep in mind:

- Special sheeting requirements at school crossings.

PEDESTRIAN CROSSING **ELEMENTS**

Figure 3B-19. Examples of Crosswalk Markings

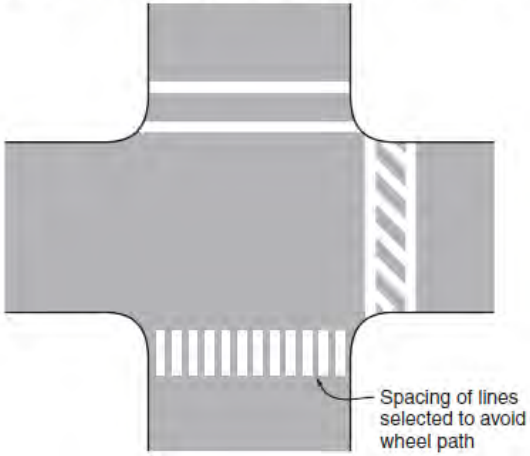
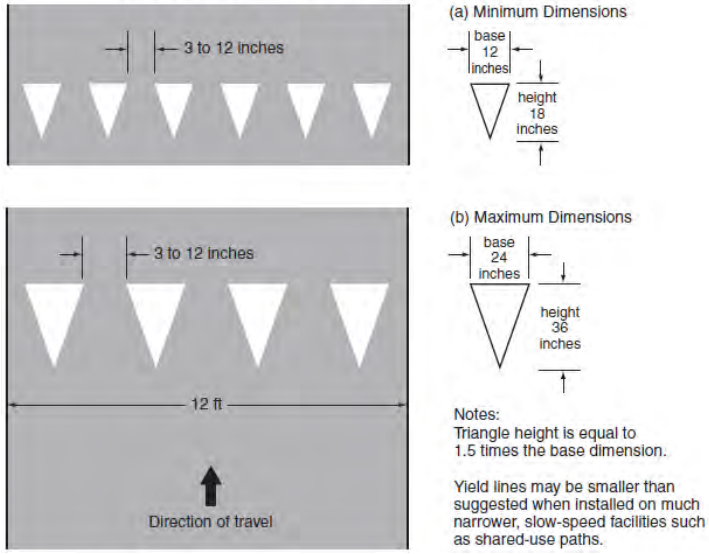


Figure 3B-16. Recommended Yield Line Layouts



Notes:
Triangle height is equal to 1.5 times the base dimension.

Yield lines may be smaller than suggested when installed on much narrower, slow-speed facilities such as shared-use paths.

Pavement Markings

Pedestrian Types:

- Bars
- Ladders

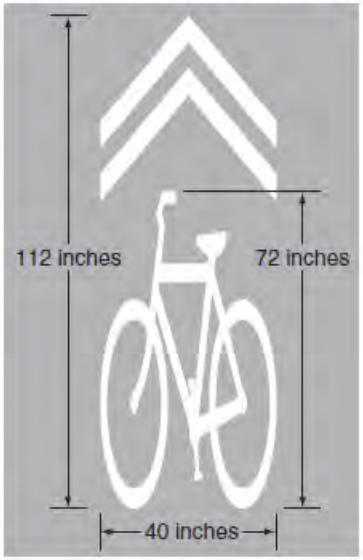
Vehicular Types:

- Stop Bar
- Yield Line

Other:

- Sharrows
- Green Pavement and Bike Boxes

Figure 9C-9. Shared Lane Marking



Note: MDT uses Yield Lines at uncontrolled locations.

PEDESTRIAN CROSSING **ELEMENTS**

Electrical

- Pedestrian Push Buttons
- Pedestrian Detection
- Pedestrian Indications
- Beacons (Round vs. Rectangular)
- Vehicular Signals

Figure 4E-1. Typical Pedestrian Signal Indications

A - With countdown display

PEDESTRIAN CROSSING **ELEMENTS**

Things to Consider

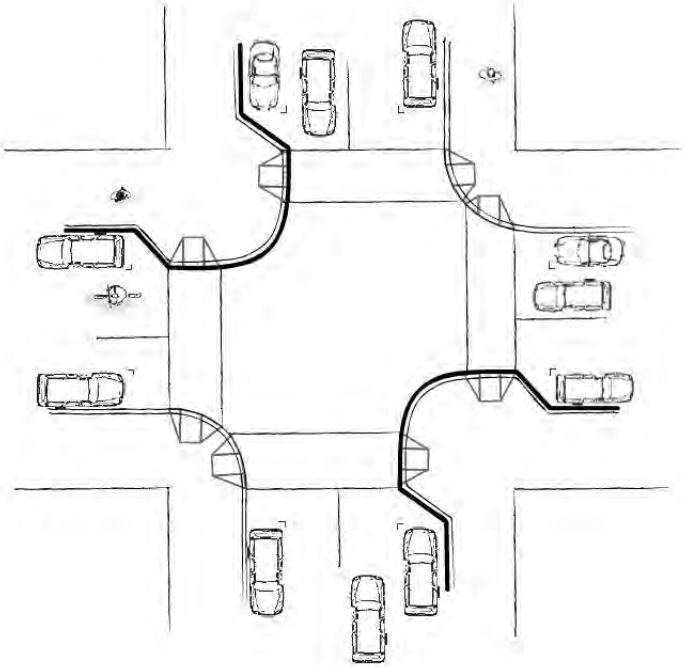
- Pedestrian refuge islands
- Chicanes
- Roadway cross slope
- Longitudinal slope
- Sight lines

CROSSING **TREATMENTS**

Bulb-Outs (aka Curb Extension)

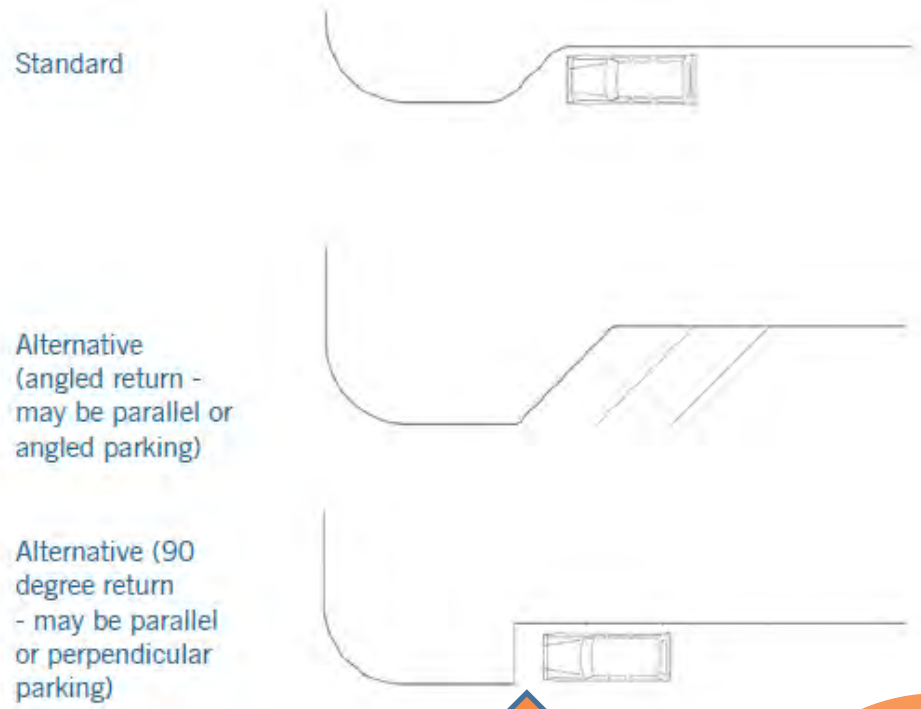
- Better pedestrian visibility
- Parked Cars
- Vegetation
- Buildings/Structures
- Sidewalk Ornaments
- Intersections or mid-block use
- Challenging drainage conveyance

CROSSING **TREATMENTS**



Bulb-Outs

- Kitty corner intersection application
  - Shortens all crosswalks, less $$
- Several styles at intersections



That should be easy to sweep/plow…

CROSSING **TREATMENTS**

Rail Crossings

- Detectable Warning Device at rail
- Flexible pavement at panels
- Panels are usually 6’ or 8’ long

CROSSING **TREATMENTS**

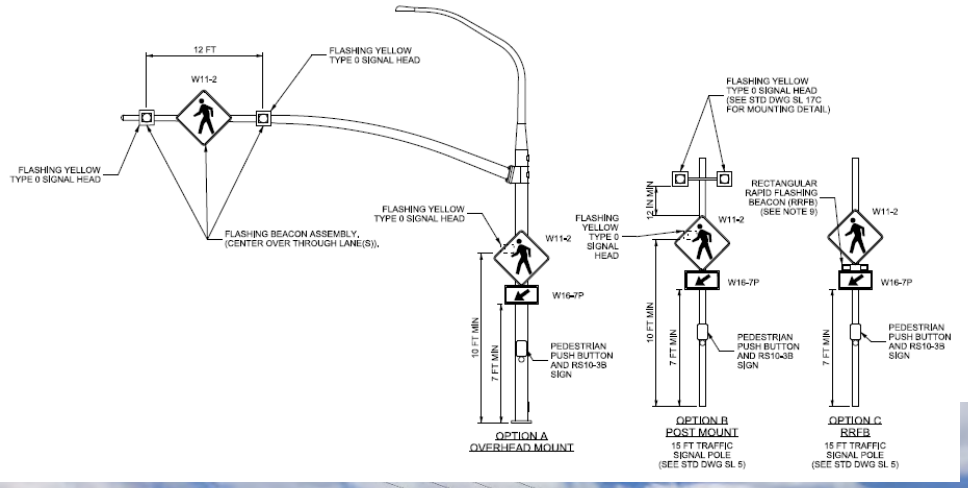
Raised Crosswalks

- Better pedestrian visibility
- Corridor Speed Control
- Intersections or mid-block use
- Challenging drainage conveyance

Other thoughts:

- Check design with local first responders!
- Plows love ‘em

CROSSING **TREATMENTS**



RRFB

Rectangular Rapid Flash Beacon

- Pedestrian activated
- Versatile
- High-visibility
- Intersections or mid-block use
- Solar-powered

FHWA Study:

- 88% compliance rate

CROSSING **TREATMENTS**

RRFB

Rectangular Rapid Flash Beacon

- Set flash duration based on 3 feet/ second pedestrian velocity

Example:

- 2 – 11’ lanes
- 5’ to push button
- 27’ total feet to cross
- 27’ /(3’ /sec) = 9 sec

Too much time will lead to compliance issues!

CROSSING **TREATMENTS**

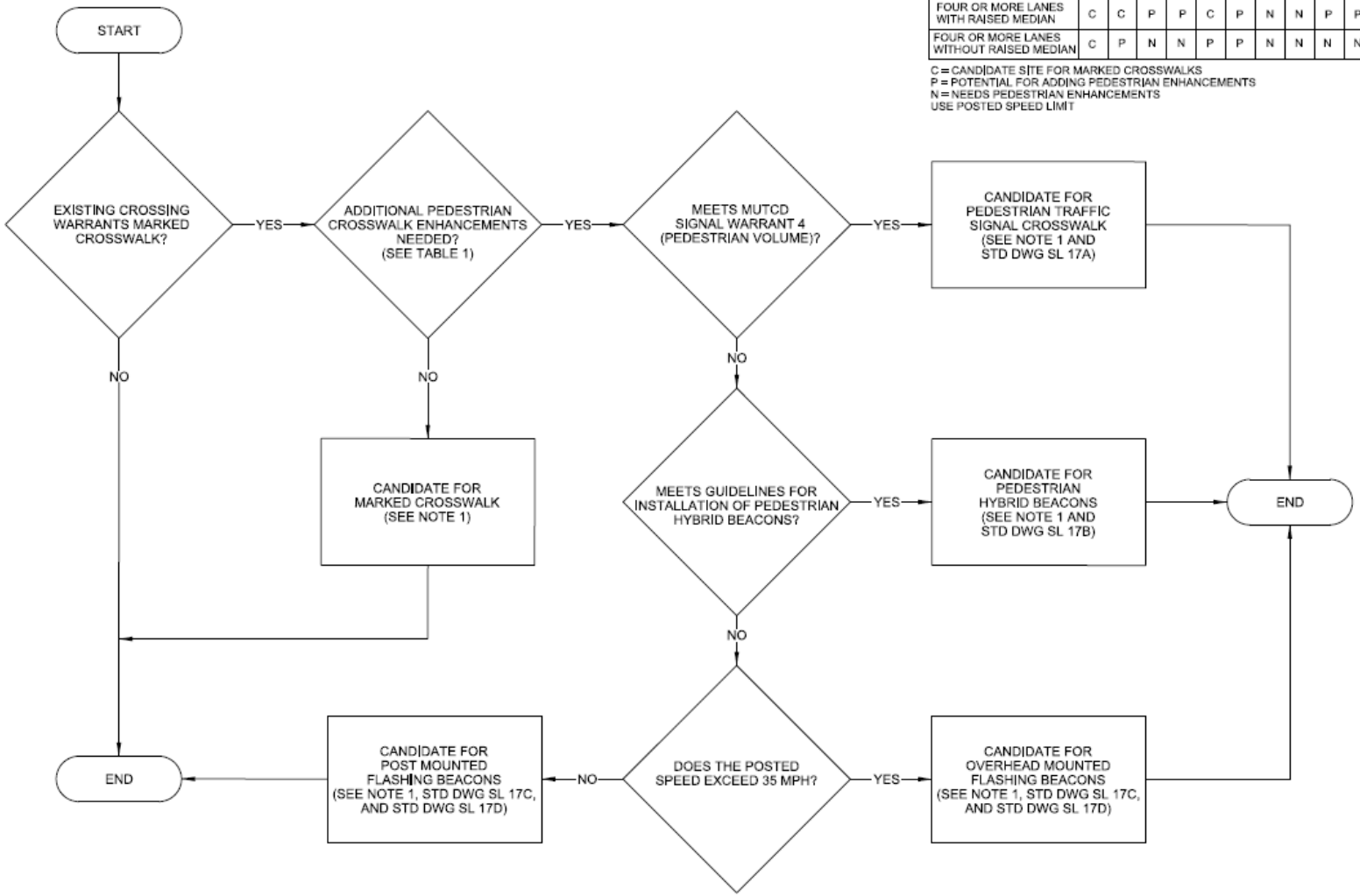
PEDESTRIAN ENHANCEMENTS FLOWCHART

UDOT Keeping Utah Moving

TABLE 1
RECOMMENDATIONS FOR INSTALLING MARKED CROSSWALKS AND ENHANCEMENTS

ROADWAY TYPE (NUMBER OF LANES AND MEDIAN TYPE)	ADT < 9,000				ADT 9,000 TO 12,000				ADT 12,000 TO 15,000				ADT > 15,000			
	30 MPH	35 MPH	40 MPH	45 MPH	30 MPH	35 MPH	40 MPH	45 MPH	30 MPH	35 MPH	40 MPH	45 MPH	30 MPH	35 MPH	40 MPH	45 MPH
TWO LANES	C	C	P	P	C	C	P	P	C	C	N	N	C	P	N	N
THREE LANES	C	C	P	P	C	P	P	P	P	P	N	N	P	N	N	N
FOUR OR MORE LANES WITH RAISED MEDIAN	C	C	P	P	C	P	N	N	P	P	N	N	N	N	N	N
FOUR OR MORE LANES WITHOUT RAISED MEDIAN	C	P	N	N	P	P	N	N	N	N	N	N	N	N	N	N

C = CANDIDATE SITE FOR MARKED CROSSWALKS
P = POTENTIAL FOR ADDING PEDESTRIAN ENHANCEMENTS
N = NEEDS PEDESTRIAN ENHANCEMENTS
USE POSTED SPEED LIMIT



CROSSING **TREATMENTS**

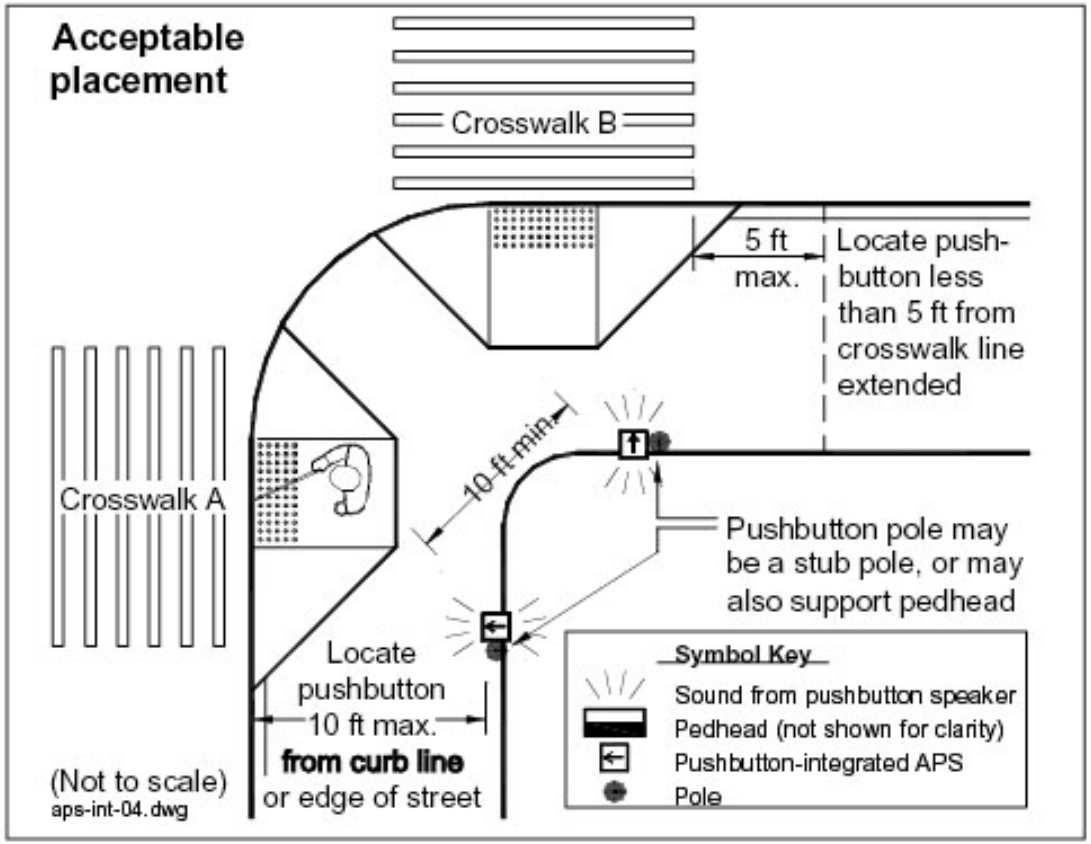
LED Lighting

- Cost effective and low maintenance
- Enhances safety at crossings with low lighting
- In-Roadway Lighting (IRWL)

CROSSING **TREATMENTS**

Signalized Intersections

Standard



OTHER NOTABLES:

- Accessible push buttons are audible, vibro-tactile and must be placed at least 10’ apart
- If they are closer than 10’, they must have street-specific messages

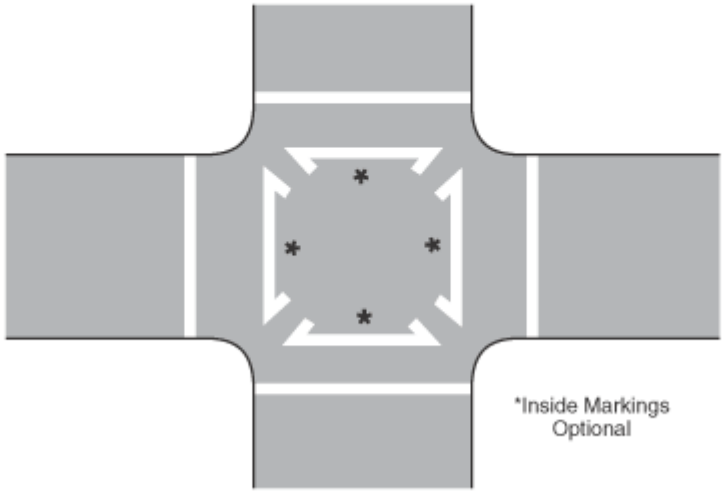
CROSSING **TREATMENTS**

Signalized Intersections

Pedestrian Scramble Phase (Exclusive Pedestrian)

- Pedestrian Signal Indication

Figure 3B-17. Example of Crosswalk Markings for Exclusive Pedestrian Phase That Permits Diagonal Crossing



You thought it was just for places like New York…

but they have been discussed in Missoula.

CROSSING **TREATMENTS**

TOUCAN Traffic Signal

TwO groUps CAN cross (bikes and peds)

- Pedestrians and cyclists
- Standard signal system for motorists
- Pedestrian-activated
- Recommended for trail or bike boulevard crossings

More information:

https://www.tucsonaz.gov/files/transportation/Crossings_brochure_3-09.pdf

CROSSING **TREATMENTS**

PELICAN Traffic Signal

PEdestrian LIght Control ActivatioN

- Two-stage crossing (median then opposite side)
- Standard signal system for motorists
- Pedestrian activated
- Mid-block use

More information:

https://www.tucsonaz.gov/files/transportation/

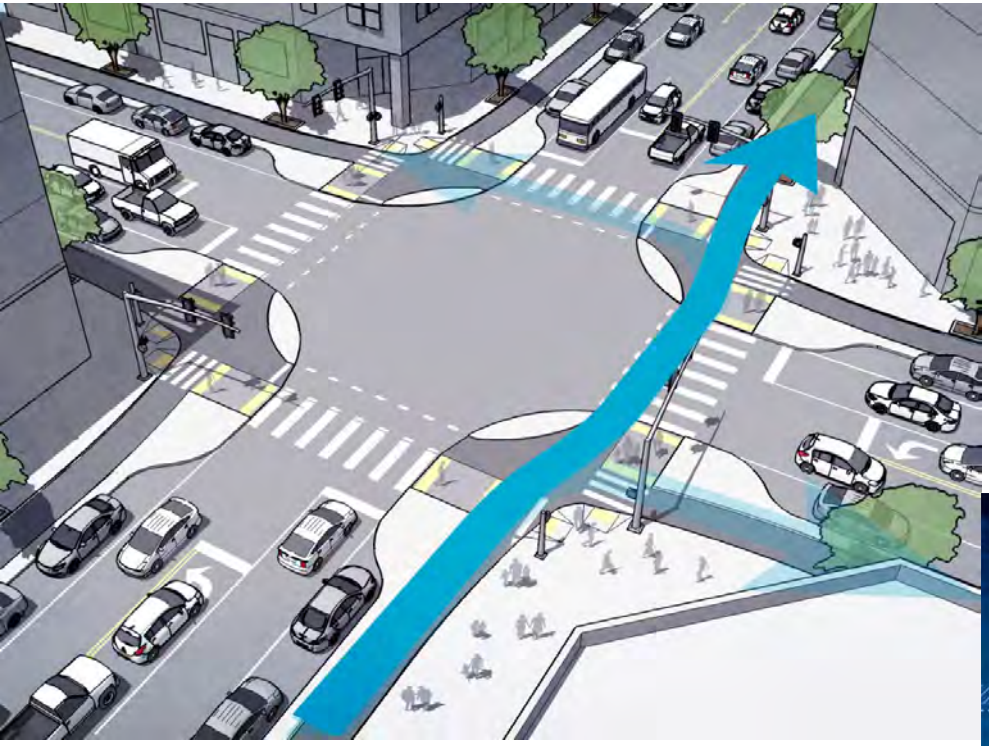
CROSSING **TREATMENTS**

HAWK

High-Intensity Activated CrossWalK

- aka: Pedestrian Hybrid Beacon
- Pedestrian activated
- Intersection or mid-block use
- Best in areas of high pedestrian activity in short intervals along high-volume roads
- 2-lane roundabouts and mid-block
- Dark until activated

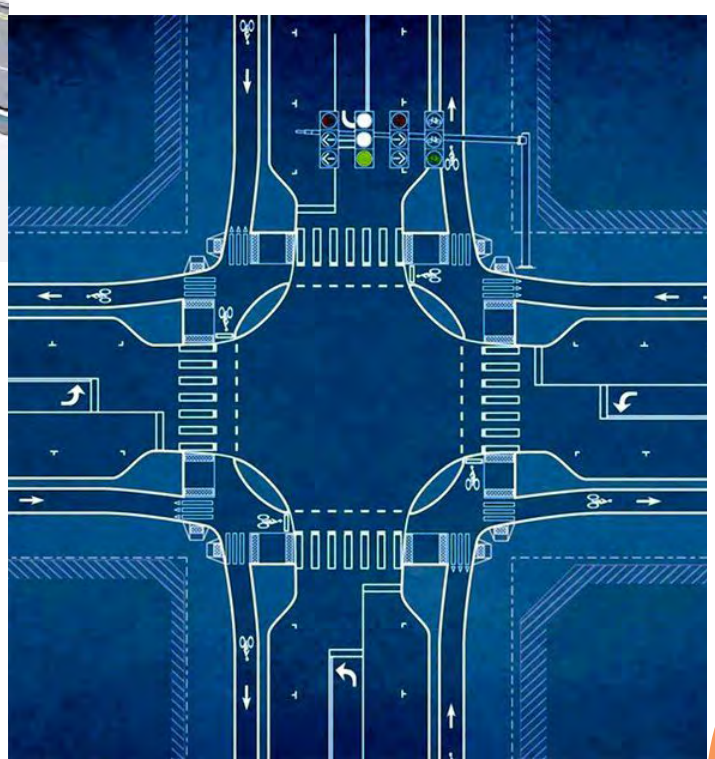
CROSSING **TREATMENTS**



Signalized Intersections

Bicycle-Enhanced

- Separated bicycle lanes
- Bulb-outs for pedestrians
- Being analyzed/considered in Portland, Oregon

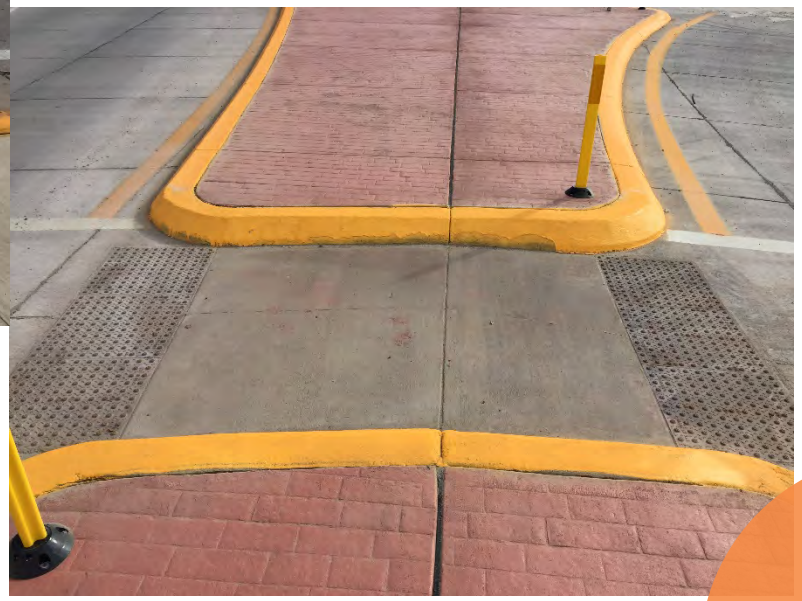


CROSSING **TREATMENTS**

Roundabout Intersections

Single-Lane

- Standard ramps with pedestrian refuge at splitter island



OTHER NOTABLES:

5’ wide minimum path at splitter island with at least 4’ between the DWDs

CROSSING **TREATMENTS**

Roundabout Intersections

Multi-Lane

- HAWK or RRFB at pedestrian crossing of two lanes
- FHWA accepting RRFBs, HAWK has red indication rather than flashing yellow

PROWAG says…

"At roundabouts with multi-lane pedestrian street crossings, a pedestrian activated signal must be provided for each multilane segment of each crossing, including the splitter island."

MDT informational site:
http://www.mdt.mt.gov/visionzero/roads/pedestrian-hybrid-beacons.shtml

CROSSING **TREATMENTS**

How much will it cost?

Pedestrian Ramp	• $2,000-$3,500 per ramp • $8,000 to $16,000 per intersection
Signing	• $300 per sign assembly • $1,200 to $1,800 per intersection
Pavement Marking	• $300 per gallon (epoxy) • $1,300 to $5,000 per intersection

CROSSING **TREATMENTS**

How much will it cost?

Bulb-Out	• $5,000 per bulb-out • Total Construction Range: $10,000 - $20,000
RRFB	• $16,000 per two-way system • Total Construction Range: $16,000 - $26,000
Raised Crosswalk	• $30,000 per crossing (2-lane) • Total Construction Range: $30,000 - $50,000

CROSSING **TREATMENTS**

How much will it cost?

HAWK	• $60,000 (electrical only) • Total Construction Range: $60,000 - $100,000
TOUCAN	• $100,000 (electrical only) • Total Construction Range: $100,000 - $200,000
PELICAN	• $100,000 (electrical only) • Total Construction Range: $100,000 - $200,000

FUNDING **OPTIONS**

Transportation Alternatives

- Competitive grant process, $6.5M awarded for 2017-2018 projects

MDT Contact:
Dave Holien
(406) 444-6118
dholien@mt.gov

For more information:
http://www.mdt.mt.gov/mdt/ta_application.shtml

Safety Funding & Congestion Mitigation and Air Quality (CMAQ)

- Contact MDT if there is an unsafe intersection on a state route in your community

MDT Contact:
Roy Peterson
(406) 444-9252
roypeterson@mt.gov

QUESTIONS


HEADS UP!
CROSS THE
STREET,
THEN
UPDATE
FACEBOOK


PEDESTRIANS
WORTH TEN
POINTS