

Engineering Toolkit

Updated 2021

For Pedestrian and Neighborhood Projects

This toolkit describes the engineering strategies the Seattle Department of Transportation commonly uses to make streets safer and more comfortable for pedestrians.

Safety Improvements

-  ↓ Reduced Pedestrian Collisions
-  ↓ Reduced Collisions
-  ↓ Reduced Turning Collisions
-  ↓ Speed Reduction
-  ↑ Increased Pedestrian Yields

Estimated Cost

-  < \$20,000.00
-  \$21,000.00 - \$100,000.00
-  > \$100,000.00

Accessibility

-  ADA Infrastructure

Installation Timeline

-  0-1 Years
-  1-3 Years
-  3+ Years

Find more information at:
<https://www.seattle.gov/transportation/projects-and-programs/programs/pedestrian-program>



Seattle
Department of
Transportation

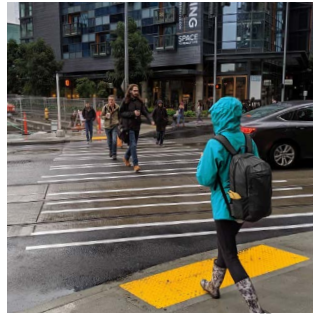
Engineering Toolkit: Crossings



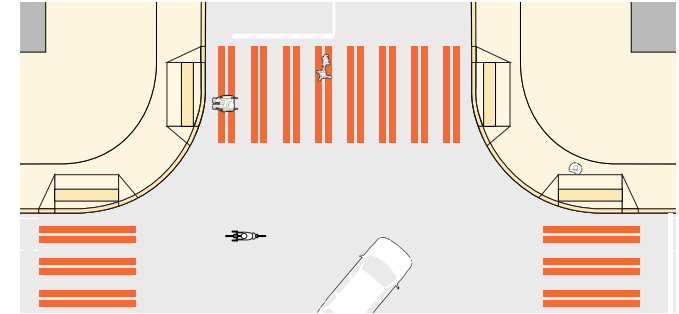
Crosswalk Marking

  20-40%

- Alerts drivers to frequent crossing locations
- For additional cost can include community designed artwork
- Includes signage to restrict parking 20 - 30' from crosswalk in order to improve visibility



8th Ave & Westlake Ave



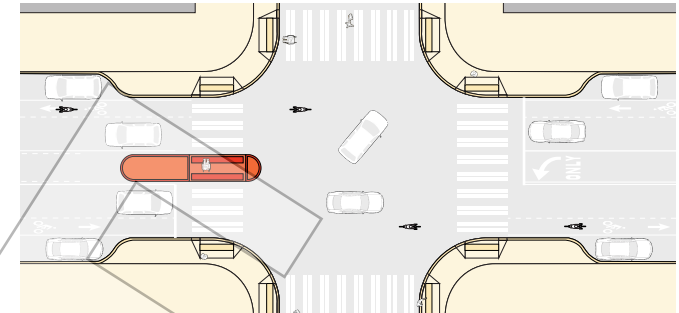
Pedestrian Refuge Island

  55%

- A space for pedestrians to cross half the roadway and wait until it is safe to cross the remainder
- Used on roads with a center turn lane or parking lane



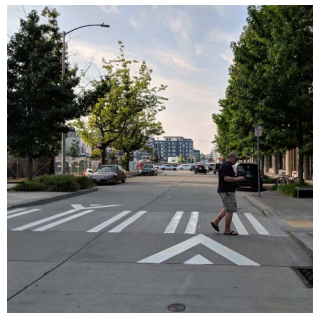
Boylston Ave E & E Olive Way



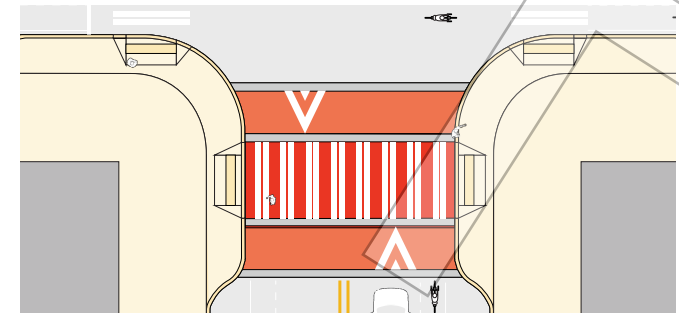
Raised Crosswalk

  45%

- A pedestrian or bicycle crossing that is above the grade of the street to better indicate presence to vehicle drivers



8th Ave



Engineering Toolkit: Curbs and Sidewalk



Sidewalk or Walkway



Traditional Sidewalk

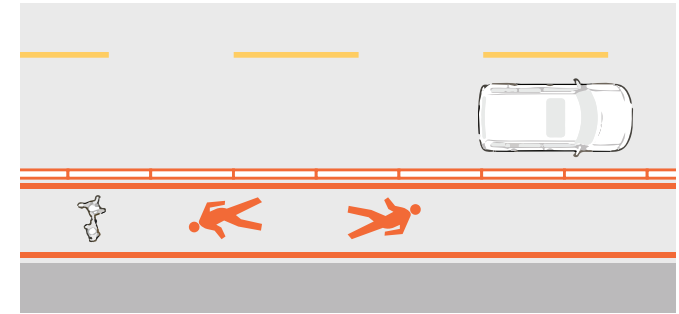
- Raised concrete sidewalk with a curb and drainage

Cost Effective Walkway

- Paved walkway level with roadway, separating pedestrians and cars
- Wheel stop curbs can be added as a low cost curb

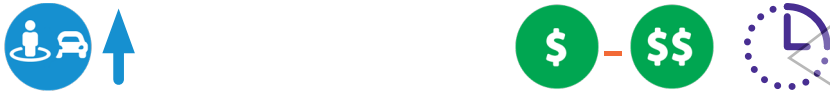


N 113th St - Cost Effective Walkway



Cost Effective Walkway

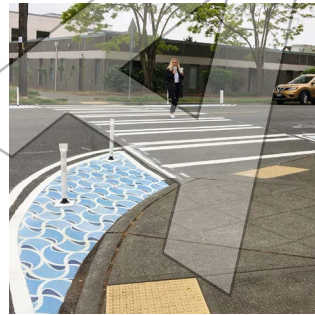
Curb Bulb



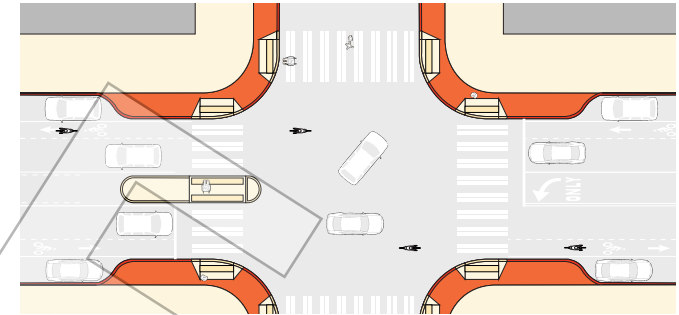
- Shortens the distance needed to cross the roadway
- Improves visibility of pedestrians waiting to cross
- Used on streets with a parking lane

Raised: more expensive, expands the sidewalk

Painted: less expensive, can include artwork



24th Ave S & E Yesler Way



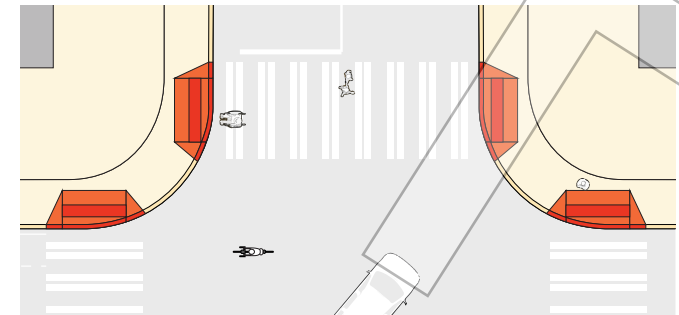
Curb Ramp



- Provides access to sidewalk for pedestrians using mobility devices
- Can be community requested through the SDOT ADA Program



7th Ave & Olive Way



Engineering Toolkit: Signals



Accessible Pedestrian Signal



- Pedestrian signals with audio cues to indicate whether walk sign is on or off and the intersection location for pedestrians who are blind, have low vision, or are blind with other disabilities
- Can be community requested through the SDOT ADA Program



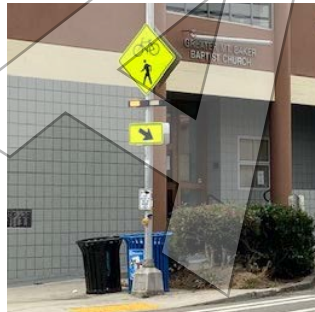
Westlake Ave N & Denny Way



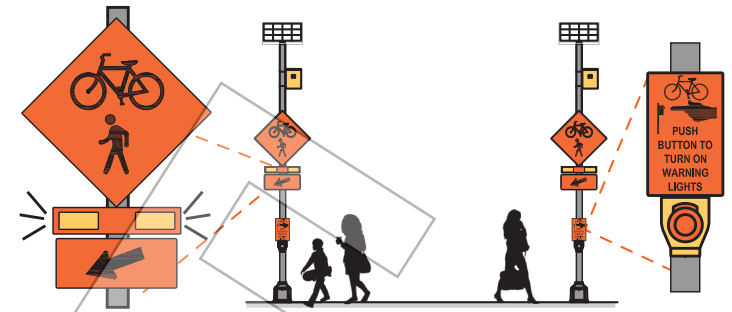
Rapid Flashing Beacon



- Blinking lights that turn on only when pedestrians or bicyclists push a button to cross the roadway
- Alerts drivers to pedestrian or bike activity on the road



25th Ave S & S Jackson St



Signal



Full Signal

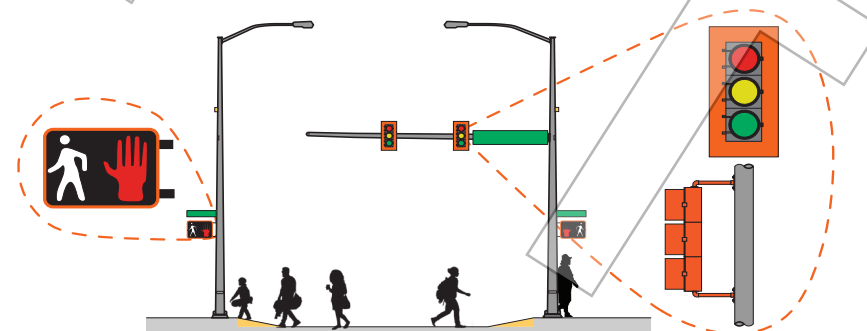
- A traffic signal that controls all vehicle and pedestrian movements at an intersection

Half Signal

- A traffic signal that stops vehicle traffic on the busier streets to allow pedestrians to cross



Pioneer Square



Engineering Toolkit: Traffic Calming



Speed Control

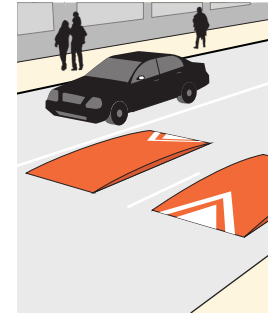


Speed Hump, Speed Cushion, Speed Table

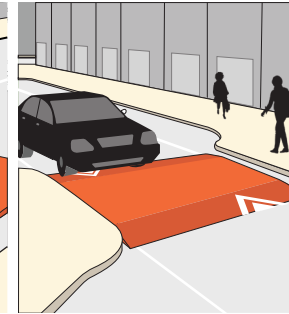
- Mid-block rise in the roadway that slows vehicles
- Speed cushions include cut outs to make it easier for emergency vehicles to pass through unhindered
- Best for streets that are steep



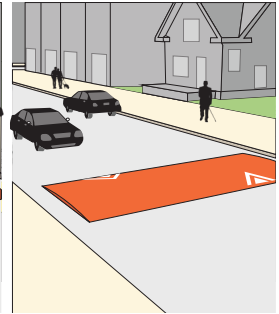
Highland Park Way SW



Speed Cushion



Speed Table



Speed Hump

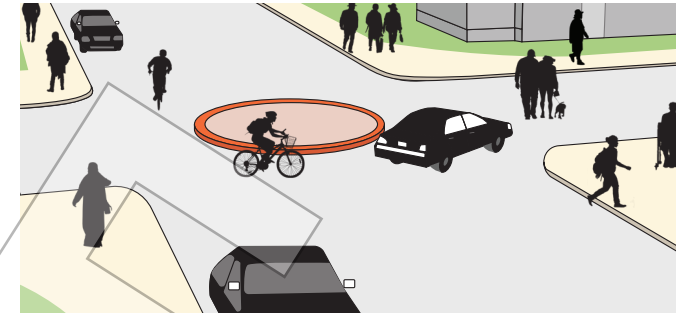
Traffic Circle



- A circle in the intersection of residential streets that requires drivers to slow and look for cross traffic
- Used on residential streets to reduce collisions and slow traffic
- Can include landscaping maintained by neighbors



Meridian Ave N & N 36th St



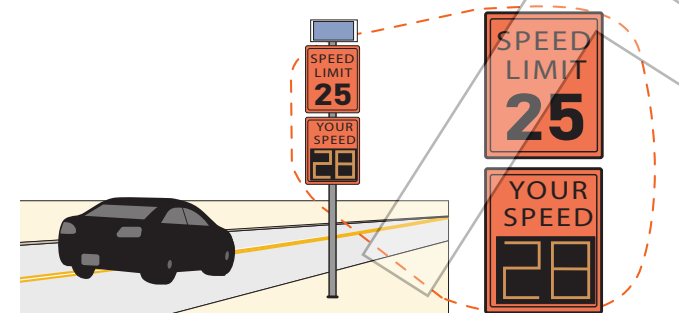
Radar Speed Feedback Sign



- Signs that display drivers' speeds to discourage speeding
- Best used on arterials and streets with a pattern of drivers traveling above the posted speed limit



Rainier Ave S & S Alaska St



Engineering Toolkit: Additional Tools



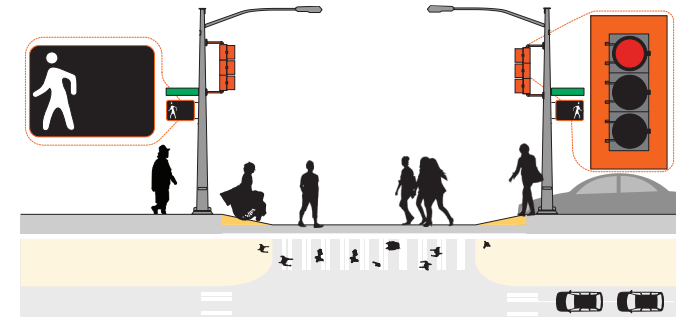
Leading Pedestrian Interval



- Walk signal that gives pedestrians a head start before traffic signal gives drivers the green light



MLK Jr Way & S Jackson St



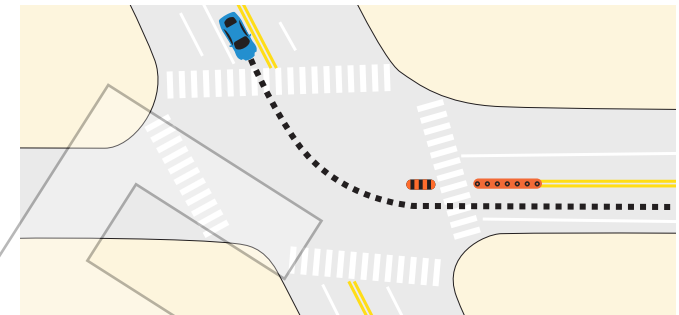
Hardened Center Line



- Raised line separating vehicle lanes at intersection before and after crosswalk, slowing left turns and improving visibility of pedestrians using the crosswalk



Rainier Ave S & S Massachusetts St



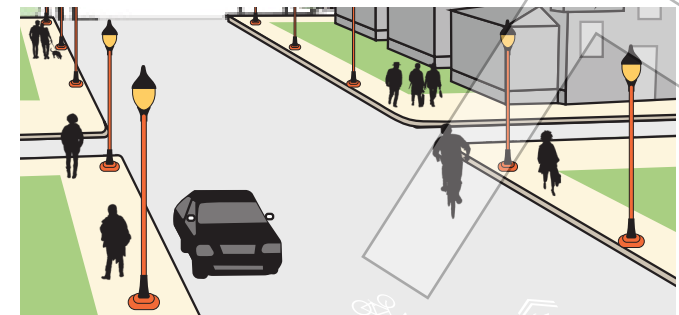
Pedestrian-Scale Lighting



- Lighting designed to brighten pedestrian spaces
- Typically shorter than traditional streetlights
- Can have a variety of designs to enhance sidewalks, parks, or other pedestrian-focused areas



Occidental St



Data Sources



Marked Crosswalk

Can reduce collisions by 20-40%

Source: Crash Modification Factors Clearinghouse (www.cmfclearinghouse.org)

Raised Crossing

Can reduce pedestrian collisions by 45%

Source: https://safety.fhwa.dot.gov/ped_bike/step/docs/techSheet_RaisedCW2018.pdf

Pedestrian Refuge Island

Can reduce pedestrian collisions by 55%

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

Sidewalks

Can reduce pedestrian collisions by 65-89%

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

Curb Bulbs

Can increase drivers yielding to pedestrians

Source: https://www.pedbikeinfo.org/cms/downloads/PedestrianLitReview_April2014.pdf#page=27&zoom=100,69,330

Signals

Half Signals: Can reduce pedestrian collisions by 55%

Source: https://safety.fhwa.dot.gov/provencountermeasures/ped_hybrid_beacon/

Flashing Beacon

Can reduce pedestrian collisions by 45%

Collision Source: Crash Modification Factors Clearinghouse (www.cmfclearinghouse.org)

Can increase drivers yielding to pedestrians by 350%

Yielding Source: <https://www.fhwa.dot.gov/publications/research/safety/pedbike/10046/index.cfm#:~:text=The%20average%20yielding%20during%20baseline,in%20yielding%20to%2087.8%20percent.>

Speed Control

Can reduce collisions by 40-50%

Source: Crash Modification Factors Clearinghouse (www.cmfclearinghouse.org)

Traffic Circle

Can reduce collisions by 30%

Source: <https://nacto.org/docs/usdg/fhwa-mini-roundabouts-technical-report.pdf>

Radar Feedback Signs

Can reduce collisions by 5%

Source: Crash Modification Factors Clearinghouse (www.cmfclearinghouse.org)

Can reduce speeds by 5-10%

Source: SDOT (Vision Zero) local study on West Marginal Way (2021)

Leading Pedestrian Interval

- Can reduce turning collisions with pedestrian by 50%
- Source: SDOT (Vision Zero) local study of LPI's

Hardened Center Lines

Can reduce turning speed by 10-16%.

Source: <https://www.portland.gov/sites/default/files/2020-07/left-turn-calming-evaluation-report.pdf>