



6. THE PEDPDX IMPLEMENTATION TOOLBOX

The Implementation Toolbox is the programmatic work plan to advance the vision and mission of PedPDX.

What is the Implementation Toolbox?

The Implementation Toolbox serves as a complement to the prioritization of infrastructure needs presented in the previous section. While the prioritization framework identifies infrastructure needs at specific locations, the Implementation Toolbox provides citywide strategies and actions for making Portland a more walkable city for all. Those strategies and actions include a variety of ways to improve the physical pedestrian network, but also include improvements to policies, programs, and planning. The strategies and actions in the PedPDX Implementation Toolbox will guide the work of all of PBOT's pedestrian-related programs and activities (these various programs are described in more detail in Chapter 7).

Data analysis and extensive outreach, including public surveys, focus groups, and work sessions with technical staff and community members, directly informed the development of the Toolbox's strategies and actions.

This robust process resulted in thirteen strategies and 67 actions.

The Toolbox serves as both a chapter of the PedPDX Plan and as a stand-alone resource for the City of Portland and its implementing partners.

What are Strategies and Actions?

The toolbox is organized by strategies and actions. Strategies are the approaches we will use to advance the PedPDX vision. Actions describe the specific means through which a strategy will be implemented.

Each PedPDX strategy includes an explanation of why that strategy is important. For each strategy, a quick reference table of all actions that support that particular strategy is provided. For each action the table identifies the following information:

- **Implementing vs. Future Action**

An “implementing action” is one that is rooted in existing City policy or that becomes policy through the City Council’s adoption of PedPDX. A “future action” is one that will be explored and pursued as future policy.

- **Category**

Actions reflect a multi-faceted approach to advancing the PedPDX mission and vision. Each action is categorized as one or more of the following types of improvements to the pedestrian environment: Infrastructure,

Policy, Funding, Maintenance, Education, Enforcement.

- **Leading Role**

PBOT is the lead agency charged with implementing PedPDX. For each action, the leading role is further defined to show the specific division or staff position within the Bureau or another department or agency within whose responsibility the action falls.

- **PedPDX Objectives Addressed**

Each action supports one or more of PedPDX’s six objectives, which are identified with a shortened label: Historic Underinvestment; Connect to Daily Needs; Funding; Vision Zero; Public Safety; and Joyful Experience.

Each action also has a “cut sheet” that provides more detailed information. The “cut sheet” defines the action and explains its intended effect on the pedestrian experience in Portland. The “cut sheet” also notes considerations that staff and implementing partners should take into account as the action is implemented.

PedPDX Objectives



HISTORIC UNDERINVESTMENT

Prioritize **investment in areas with the greatest historic underinvestment** in pedestrian infrastructure and with historically under-served populations to reduce disparities in access to safe pedestrian facilities.



CONNECT TO DAILY NEEDS

Complete and maintain a Pedestrian Priority Network that encourages walking for people of all ages, cultures, and abilities, and **connects people to their essential daily needs**.



FUNDING

Commit to funding pedestrian network improvements in the Pedestrian Priority Network.



VISION ZERO

Support the City's Vision Zero commitment to **eliminate traffic-related deaths and serious injuries**.



PUBLIC SAFETY

Protect the **public safety and personal security** of people walking.



JOYFUL EXPERIENCE

Make walking in Portland **a joyful experience** that helps people connect with their community.

How will the Toolbox be Used?

The PedPDX Implementation Toolbox is a shared workplan. It is not intended to be a comprehensive resource documenting all potential opportunities for improving the safety and mobility of pedestrians, but rather an articulation of the key actions and tools the City will use to implement PedPDX.

Improving the safety and mobility of people walking in Portland cannot be limited to the resources of one staff person, one division, or one agency. It requires a broad, ongoing effort that leverages the expertise and funding opportunities from many different people and programs. The Toolbox facilitates this broad coordination.

Following the adoption of PedPDX, City of Portland staff will refer to the PedPDX Toolbox to set priorities and refer to the action “cut sheets”

to inform work programs. With the quick reference indices provided in the Toolbox, staff can identify actions for which they are responsible, initiate discussion with coordinating staff or partners, and collaborate to ensure that program, policy and facility development are aligned with PedPDX goals.

Implementing partners, such as ODOT, Metro, and TriMet, can refer to the Toolbox strategies and actions to consider their own roles in supporting these efforts and aligning resources and initiatives that serve shared goals.

The PBOT Pedestrian Coordinator will track implementation of the 67 actions listed in the PedPDX Implementation Toolbox using the measures identified in the next section of this document (7. Implementing the Plan).

Strategies & Actions

	STRATEGIES & ACTIONS	PAGE #
STRATEGY 1	ADDRESS GAPS IN THE PEDESTRIAN PRIORITY NETWORK	137
ACTION 1.1	Fund and construct high priority crossing and sidewalk needs identified through PedPDX.	139
ACTION 1.2	Apply new marked crossing spacing guidelines as part of PBOT capital projects.	140
ACTION 1.3	Explore options to enable and encourage off-site pedestrian improvements by private development.	143
STRATEGY 2	IMPROVE VISIBILITY OF PEDESTRIANS AT CROSSINGS	145
ACTION 2.1	Implement vision clearance guidelines at uncontrolled crossings in conjunction with PBOT capital projects, development review, and paving projects.	148
ACTION 2.2	Identify key intersections for retroactive vision clearance improvements by Safe Routes to School, Neighborhood Greenways, Vision Zero, and Pedestrian Network Completion programs.	150
ACTION 2.3	Evaluate the need for vision clearance guidelines at controlled crossings and on local streets.	151
ACTION 2.4	Provide high visibility crosswalks at all marked crossings when restriping or providing new crosswalks.	152
ACTION 2.5	Clarify design guidance for tree location within the right-of-way.	153
ACTION 2.6	Update PBOT design guidance to maximize the use of curb extensions, floating curb extensions, and interim painted curb extensions within the Pedestrian Priority Network at both controlled and uncontrolled crossings.	154
STRATEGY 3	REDUCE TURNING MOVEMENT CONFLICTS AT INTERSECTIONS	157
ACTION 3.1	Develop guidelines and practices for separating vehicle turning movements concurrent with the pedestrian walk phase and incorporate signal timing analysis into capital project scopes.	160
ACTION 3.2	Develop a pilot to study prohibiting “turn-on-red” within Pedestrian Districts and at High Pedestrian Crash Intersections.	162
ACTION 3.3	Reduce uncontrolled left turn conflicts at arterial/non-arterial intersections along Major City Walkways, City Walkways, and High Crash Corridors in conjunction with capital projects.	163
ACTION 3.4	Identify and fund key intersections for signal timing improvements to separate pedestrian crossing and vehicle turning movements, prioritizing high crash intersections.	164
ACTION 3.5	Use raised crosswalks to slow automobile turning movements at arterial/non-arterial intersections.	165
STRATEGY 4	IMPROVE PEDESTRIAN SAFETY AND COMFORT AT CROSSINGS AND TRANSIT STATIONS	167
ACTION 4.1	Continue to test passive pedestrian detection technology.	170
ACTION 4.2	Evaluate the need to update crosswalk design guidelines at uncontrolled multi-lane crossings.	172
ACTION 4.3	Develop City design guidance for transit station platforms that maximize safety and comfort for people walking, biking, and taking transit.	
STRATEGY 5	SEEK COST-EFFECTIVE AND CREATIVE SOLUTIONS TO PROVIDE PEDESTRIAN IMPROVEMENTS	175
ACTION 5.1	Provide lower-cost pedestrian walkways.	177
ACTION 5.2	Provide interim pedestrian improvements.	178
ACTION 5.3	Leverage paving projects for pedestrian improvements.	179
ACTION 5.4	Convert existing fire signals to pedestrian crossings to help meet crossing spacing guidelines.	180
ACTION 5.5	Leverage bicycle infrastructure to also serve pedestrians, including neighborhood greenways.	181
ACTION 5.6	Improve unimproved rights-of-way for pedestrian travel.	182

Strategies & Actions Continued...

STRATEGY 6	PROVIDE ADEQUATE STREET LIGHTING FOR PEDESTRIANS	185
ACTION 6.1	Implement new lighting level guidelines in conjunction with capital projects and private development.	188
ACTION 6.2	Strategically improve street lighting conditions to increase visibility of (and for) pedestrians on our streets, focusing investment on High Crash Corridors and locations, Pedestrian Priority Streets, and underserved areas.	190
ACTION 6.3	Address locations where street lighting is blocked by tree canopy.	191
STRATEGY 7	MANAGE VEHICLE SPEEDS AND IMPROVE DRIVER AWARENESS	193
ACTION 7.1	Set safe speeds on arterials and collectors.	196
ACTION 7.2	Expand automated enforcement activities.	198
ACTION 7.3	Identify opportunities to retrofit signal timing along the High Crash Network to manage vehicle speeds.	199
ACTION 7.4	Expand crosswalk enforcement and education activities.	
ACTION 7.5	Explore traffic citation policy and structural changes to address inequitable impact of fines and fees on people with lower-incomes.	
ACTION 7.6	Expand safety education/outreach efforts focusing on people driving.	202
ACTION 7.7	Establish a program to provide traffic calming on neighborhood streets.	204
STRATEGY 8	CONSTRUCT AND MAINTAIN OBSTRUCTION-FREE SIDEWALKS	207
ACTION 8.1	Identify financing strategies cost-saving opportunities to help low-income households and other property owners address sidewalk repair.	210
ACTION 8.2	Address sidewalk repair needs along City-owned properties.	212
ACTION 8.3	Explore a proactive sidewalk inspection program.	213
ACTION 8.4	Update coordination practices with Urban Forestry when trees are uplifting sidewalks and develop joint practices for addressing tree/sidewalk conflicts.	214
ACTION 8.5	Expand property owner education regarding responsibility for maintaining sidewalks.	215
ACTION 8.6	Update right-of-way design standards to provide sufficient room for trees.	216
ACTION 8.7	Address utility poles creating obstructions in through zone of the sidewalk.	217
ACTION 8.8	Update clear zone requirements for outdoor dining and A-board signage based on new PedPDX pedestrian classifications.	218
ACTION 8.9	Locate utility vaults outside of pedestrian clear zones.	220
ACTION 8.10	Coordinate with street cleaners to help ensure that pedestrian facilities including curb ramps and crossings are debris-free.	222
ACTION 8.11	Improve enforcement and implementation of pedestrian access requirements around work zones, and establish a system for notifying residents of construction-related changes to pedestrian access.	224
ACTION 8.12	Educate about parking violations at driveways and crossings.	226
ACTION 8.13	Work with the disability community to develop trip planning assistance.	227
ACTION 8.14	Develop a public reporting system and a process for addressing drainage issues at curb ramps with pooling water.	228
STRATEGY 9	PRO-ACTIVELY LEVERAGE, MANAGE, DESIGN FOR, AND SET POLICIES FOR NEW AND EMERGING TECHNOLOGIES	231
ACTION 9.1	Articulate desired outcomes for pedestrians in the New Mobility Action Strategy.	233
ACTION 9.2	Develop regular pedestrian counting systems and practices.	234
ACTION 9.3	Test new technologies and establish methods to collect better pedestrian data in Portland.	235

Strategies & Actions Continued...

STRATEGY 10	PROVIDE OPPORTUNITIES FOR AN INTERESTING AND ENJOYABLE PEDESTRIAN EXPERIENCE	237
ACTION 10.1	Establish a program for community implementation of “creative crosswalks.”	239
ACTION 10.2	Encourage seating in the right-of-way.	240
ACTION 10.3	Work with partners to update the City’s pedestrian wayfinding system.	241
ACTION 10.4	Encourage more programs, events, and projects that create a car-free environment.	242
ACTION 10.5	Integrate public art into capital improvement projects.	243
ACTION 10.6	Engage and work with community partners to co-promote walking events that help people take ownership over investments and use new infrastructure.	244
STRATEGY 11	WORK WITH DEVELOPERS, RESIDENTS, AND PROPERTY OWNERS TO PROVIDE PEDESTRIAN IMPROVEMENTS	247
ACTION 11.1	Update the 1998 pedestrian design guidelines to guide future frontage improvements made in conjunction with private development.	249
ACTION 11.2	Explore a fee program for development activity on arterial and collector streets as an alternative to building required sidewalk improvements where individual frontage improvements may not be practicable.	250
ACTION 11.3	Update our approach to local improvement districts and waivers of remonstrance.	252
ACTION 11.4	Provide a pathway for residents, property owners, and businesses to self-fund pedestrian improvements not prioritized for City investment.	254
ACTION 11.5	Update design guidelines to require pedestrian improvements on unimproved rights-of-way as part of the development review process.	255
STRATEGY 12	ADDRESS PUBLIC SAFETY AND SECURITY CONCERNS FOR PEOPLE WALKING ON CITY SIDEWALKS	257
ACTION 12.1	Increase lighting per new street lighting level guidelines, focusing investment in underserved communities.	259
ACTION 12.2	Partner with other agencies and City bureaus to advance the well-being and personal security of vulnerable communities as they use Portland transportation infrastructure.	260
ACTION 12.3	Continue research on racial bias and driving behavior.	261
STRATEGY 13	USE EDUCATION AND OUTREACH TO HELP PORTLANDERS KEEP THEMSELVES SAFE WHILE WALKING	263
ACTION 13.1	Expand safety education/outreach focusing on people walking.	266
ACTION 13.2	Expand pedestrian safety education programs targeted to seniors.	268
ACTION 13.3	Expand pedestrian safety education programs targeted to school children.	269

PAGE INTENTIONALLY LEFT BLANK.



STRATEGY 1

Address gaps in the Pedestrian Priority Network

This strategy supports the overarching need to access the pedestrian network and focuses on filling sidewalk gaps and increasing the number of safe pedestrian crossing locations. Feedback from the Walking Priorities Survey indicate that Portland residents feel there are currently not enough places to cross busy streets. The PedPDX Safety Analysis revealed that crashes at unmarked locations are more likely to occur where marked crosswalk spacing does not meet the new PedPDX crossing spacing guidelines.

Strategy 1

Address gaps in the Pedestrian Priority Network

Table 8: Index of Strategy 1 Actions

ACTION	IMPLEMENTING VS. FUTURE ACTION	CATEGORY	LEADING ROLE/ COORDINATION
1.1 Fund and construct high priority crossing and sidewalk needs identified through PedPDX.	Implementing Action (policy adopted with PedPDX)	Infrastructure; Funding	PBOT Pedestrian Coordinator
1.2 Apply new marked crossing spacing guidelines as part of PBOT capital projects.	Implementing Action (policy adopted with PedPDX)	Policy; Infrastructure	PBOT Capital Delivery Division
1.3 Explore options to enable and encourage off-site pedestrian improvements by private development.	Future Action	Policy; Infrastructure	PBOT Development Permitting and Transit

ACTION 1.1

PEDPDX OBJECTIVES ADDRESSED



Fund and construct high priority crossing and sidewalk needs identified through PedPDX.

PedPDX identifies priority crossing gaps, where marked crossings are not provided at the frequency required by the City's new crossing spacing guidelines, as well as potential crossing deficiencies where an existing crossing may not meet current design guidance. The Plan also identifies and prioritizes gaps in the sidewalk network. Prioritized needs on the Pedestrian Priority Network are eligible for funding through the Pedestrian Network Completion Program, which is directly charged with expanding the city's network of sidewalks, walking paths, and crossings. The Pedestrian Network Completion Program will develop regular implementation plans to identify high priority crossing and sidewalk improvements to be funded and constructed through the program.

Additionally, PedPDX priority needs will influence pedestrian projects selected from the Transportation System Plan (TSP) for implementation and grant opportunities. All TSP projects are prioritized into two categories for implementation. Projects are prioritized for 1-10 year implementation, or 11-20 year implementation. PedPDX does not influence the TSP's methodology for prioritizing projects into these broad implementation categories. However, the PedPDX prioritization will be used to help determine how pedestrian-related projects are prioritized for implementation within these broad categories as funding opportunities arise.



Considerations

The Pedestrian Network Completion Program will apply the PedPDX prioritization methodology regularly to identify priorities based on current equity, safety, and demand data. While the Pedestrian Network Completion Program will be driven by the PedPDX prioritization, other factors will also be considered when developing program priorities, including project readiness, project feasibility, available funding, leverage opportunities, and key pedestrian destinations/generators within prioritized locations.

Strategy 1

Address gaps in the Pedestrian Priority Network

PEDPDX OBJECTIVES ADDRESSED

ACTION 1.2



Apply new marked crossing spacing guidelines as part of PBOT capital projects.

In Oregon, every intersection is a legal “crosswalk” (ORS 801.220), unless prohibited with crosswalk closed signage. As such, pedestrians are legally permitted to cross any street at any intersection whether the crossing is marked or not, and motorists are required to yield.

A major component of the City’s Vision Zero effort to eliminate traffic-related deaths and serious injuries on Portland streets includes increasing the number of locations where people walking and biking can comfortably cross busy streets. While the City has guidelines in place for determining crossing design treatments appropriate for various roadway types, there has traditionally been no guidance in place regarding desired spacing between marked and/or enhanced pedestrian crossing opportunities.

While research on exactly how far a person walking will travel out of direction to access a marked or enhanced pedestrian crossing is scant, it is a general rule of thumb that people walking will typically take the shortest route from point A to point B¹. Increasing the number of marked and enhanced crossing opportunities increases the number of options for people walking to cross the street.

PedPDX establishes new design guidelines for the desired frequency of marked pedestrian crossings in Portland. Upon adoption of PedPDX, the City Traffic Engineer will issue a directive formally instituting the new PedPDX crossing spacing guidelines as part of PBOT engineering and design practice.

¹ The AASHTO Green Book notes that “Pedestrians tend to walk in a path representing the shortest distance between two points” (as quoted by King, Michael in To Cross or Not to Cross, Examining the Practice of Determining Crosswalks, ITE Journal, November 2014.)

These guidelines are intended to identify crossing gaps in Portland’s pedestrian network, and vary according to the street’s pedestrian classification. Crossing spacing guidelines will be implemented by PBOT capital projects moving forward. PBOT will scope and adequately fund capital projects to include improved crossings on streets where these spacing guidelines are not currently met. Crossing gaps outside of planned capital projects will be implemented via the Pedestrian Network Completion program.

Existing City guidelines require a minimum of 20 people per hour crossing the street (walking or biking) in a given location to mark a crosswalk. In meeting new PedPDX crossing spacing guidelines, PBOT will apply the following approaches to demonstrating that new marked crossings are warranted:

- **Within Pedestrian Districts:** New marked/enhanced crossings on City Walkways and Major City Walkways (all arterials and collectors) within Pedestrian Districts will be determined based on anticipated and desired future use. Given the high volume of pedestrian traffic anticipated in Pedestrian Districts, City staff will establish desired crossing volumes for pedestrian crossings on these pedestrian-oriented street types. As such, a minimum of 20 pedestrians crossing during peak hour will not be required to justify new marked crossings within Pedestrian Districts.

Inside Pedestrian Districts:

DESIRED SPACING OF

530 feet

between marked crossings



City Walkways and Major City Walkways within Pedestrian Districts

DESIRED CROSSING FREQUENCY

530 ft

Pedestrian Districts are areas where high levels of pedestrian activity exist or are planned, including the Central City, Gateway regional center, town centers, and near MAX stations.

For Major City Walkways and City Walkways within Pedestrian Districts the desired spacing between marked pedestrian crossings is 530 feet.

Demonstrating existing crossing demand will not be required to justify new marked crossings within Pedestrian Districts.

On a street with standard 200-ft blocks, the 530-ft crossing frequency results in a marked pedestrian crossing approximately every other block.

Outside of Pedestrian Districts:

DESIRED SPACING OF

800 feet

between marked crossings



City Walkways and Major City Walkways outside of Pedestrian Districts

DESIRED CROSSING FREQUENCY

800 ft

City Walkways and Major City Walkways provide walking access to important land use and transit destinations. The desired spacing between marked pedestrian crossings on these streets is 800 feet.

On a street with standard 200-ft blocks, the 800-ft crossing frequency results in a marked and/or enhanced pedestrian crossing approximately every three blocks.

To ensure that new marked crossings on streets with lower pedestrian volumes do not result in driver disregard of crosswalks, a minimum of 20 pedestrian/bicycle crossings per peak hour will be required to provide new marked/enhanced crossings on City Walkways and Major City Walkways outside of Pedestrian Districts or where there is not a transit stop.

At Transit stops:

WITHIN OF ALL TRANSIT STOPS

100 ft



Transit Stops

DESIRED CROSSING WITHIN

100 ft

Moving forward, PBOT practice will be to provide a marked pedestrian crossing at all transit stops², regardless of street classification.

Demonstrating existing crossing demand will not be required to justify new marked crossings at transit stops.

Marked crossing requirements at transit stops may be implemented by providing new marked crossings at existing transit stops, and/or by strategically relocating or consolidating transit stops such that they are located at existing marked crossings. This will require PBOT capital project managers to collaborate with TriMet to consolidate, relocate, or otherwise confirm stop locations.

2. Engineering judgment may deem marked crossings unwarranted in some locations, particularly on two-lane streets with very low vehicle volumes and low transit ridership

Strategy 1

Address gaps in the Pedestrian Priority Network

- **City Walkways and Major City Walkways Outside of Pedestrian Districts:** Crossing demand and pedestrian volumes are likely lower on streets outside of Pedestrian Districts. To ensure that new marked crossings on streets with lower pedestrian volumes do not result in driver disregard of crosswalks, a minimum of 20 pedestrian/bicycle crossings per peak hour will still be required to provide new marked/enhanced crossings on City Walkways and Major City Walkways outside of Pedestrian Districts or where there is not a transit stop. Projected future crossing volumes (in addition to current volumes) may be used to meet this minimum crossing volume. Note that this may result in temporarily deferring new marked crossings in certain locations on City Walkways or Major City Walkways outside of a Pedestrian District or transit stop, though crossing spacing standards may identify a network gap.
- **Transit stops:** Moving forward, PBOT practice will be to provide a marked pedestrian crossing at all transit stops. A minimum of 20 pedestrians crossing during peak hour will not be required to justify new marked crossings at transit stops. Implementing this new guideline will require collaborating with TriMet staff to consolidate, relocate, or otherwise confirm transit stop locations before determining marked crossing needs to help meet this guideline.

Considerations

These crossing spacing guidelines are intended to identify gaps where further engineering analysis is required. While the stated desired distances between marked pedestrian crossings should generally not be exceeded, the exact location of marked crossings should be context-driven, and will be determined based on pedestrian crossing demand, specific land use generators, sight distance needs, proximity to traffic signals, existing pedestrian crossings, and engineering judgment.

As new design guidelines, the PedPDX Crossing Spacing Guidelines will be implemented as part of new capital projects as they are scoped and constructed. While these spacing guidelines will determine the general locations where additional marked pedestrian crossings should be evaluated, the design of those crossings (whether a simple marked crosswalk is provided, or whether additional enhancements are provided) will be determined by existing City guidelines outlining the types of crossing design treatments appropriate for various roadway types.

ACTION 1.3



Explore options to enable and encourage off-site pedestrian improvements by private development.

PBOT's Development Permitting and Transit group reviews and permits all street and frontage improvements associated with private development. In Portland, private development is often required to make street frontage improvements along the property as part of a development project. This includes providing or improving sidewalks in a manner consistent with the City's rules and the Pedestrian Design Guide. A large proportion of new sidewalks constructed or improved in Portland over time have been provided in conjunction with private development activities.

Current case law on exactions often limits developers to improving the sidewalk frontage directly adjacent to the property. There are few mechanisms in place to encourage or require private developments to provide pedestrian infrastructure beyond the immediate property frontage, including crossing enhancements that could serve future tenants, or sidewalk extensions beyond the property to connect to new development to surrounding neighborhoods.

PBOT Development Permitting and Transit team will work with PBOT Policy, Innovation, and Regional Collaboration staff, the City Attorney, and City Council to explore mechanisms for encouraging off-site pedestrian improvements in conjunction with private development. Options to explore include updating PBOT's development review criteria to require off site pedestrian mitigations when appropriate.

Considerations

Changes to PBOT development review criteria or will likely require updates to City Code and authorization by the City Attorney and City Council. Establishing a funding source for PBOT Development Review to leverage private pedestrian improvements could also help maximize improvements provided by private development.



Crossing improvements made in conjunction with new development can help address the increase in demand on the pedestrian network and help serve future tenants and/or residents

PAGE INTENTIONALLY LEFT BLANK.



STRATEGY 2

Improve visibility of pedestrians at crossings

The PedPDX Safety Analysis found that citywide, 70% of pedestrian crashes in Portland occur at intersections (in Oregon, every intersection is a legal crosswalk). Making sure pedestrians crossing the street are visible to people driving is a critical factor for increasing pedestrian safety on our roadways. The following actions seek to improve visibility conditions at pedestrian crossings through intersection design, changes to street markings, and by applying vision clearance best practices. The actions presented as part of this strategy may be viewed as a set of tools for improving visibility of pedestrians at intersections. The appropriate treatment or set of treatments will vary according to context.

Improved street lighting at intersections and crossings is also a critical tool for improving visibility of pedestrians and will be addressed in greater detail as part of Strategy 6.

Strategy 2

Improve visibility of pedestrians at crossings

Table 9: Index of Strategy 2 Actions

ACTION	IMPLEMENTING VS. FUTURE ACTION	CATEGORY	LEADING ROLE
2.1 Implement vision clearance guidelines at uncontrolled crossings in conjunction with PBOT capital projects, development review, and paving projects.	Implementing Action (policy adopted with PedPDX)	Policy	PBOT Capital Delivery Division; PBOT Development Review; PBOT Parking
2.2 Identify key intersections for retroactive vision clearance improvements by Safe Routes to School, Neighborhood Greenways, Vision Zero, and Pedestrian Network Completion programs.	Future Action	Infrastructure	Vision Zero; Safe Routes to School; Neighborhood Greenways; PBOT Traffic Investigations
2.3 Evaluate the need for vision clearance guidelines at controlled crossings and on local streets.	Future Action	Policy	City Traffic Engineer
2.4 Provide high visibility crosswalks at all marked crossings when restriping or providing new crosswalks.	Implementing Action (policy adopted with PedPDX)	Infrastructure	PBOT Capital Delivery Division; PBOT Maintenance Operations
2.5 Clarify design guidance for tree location within the right-of-way.	Future Action	Policy	Urban Forestry; City Traffic Engineer
2.6 Update PBOT design guidance to maximize the use of curb extensions, floating curb extensions, and interim painted curb extensions within the Pedestrian Priority Network at both controlled and uncontrolled crossings.	Future Action	Policy	Streets 2035 Project Manager; PBOT Modal Coordinators; City Traffic Engineer

PAGE INTENTIONALLY LEFT BLANK.

Strategy 2

Improve visibility of pedestrians at crossings

ACTION 2.1

Implement vision clearance guidelines at uncontrolled crossings in conjunction with PBOT capital projects, development review, and paving projects.

In many locations throughout the city, vehicles have historically been permitted to park all the way to the edges of street corners. This practice can significantly decrease visibility at street intersections and crossings, making it difficult for people driving to see pedestrians and bicyclists attempting to cross the street. This is a particular concern along busy arterials, and in locations with high pedestrian and bicycle crossing demand (including in neighborhood centers, retail districts, and along neighborhood greenways). While pedestrians and bicyclists are most vulnerable, inadequate vision clearance impacts safety for all modes, as parked cars at street corners can make it difficult for people driving to see oncoming traffic when turning onto or crossing busy streets.

To improve safety for all modes at street intersections and crossings, PBOT has updated our design guidelines to set back on-street parking a minimum of 20 feet from the approaches to all marked and unmarked crosswalks on pedestrian priority streets. This new design guideline was enacted by a directive from the City Traffic Engineer in 2018. Pedestrian priority streets include Major City Walkways, City Walkways, Neighborhood Greenways, and streets on the High Crash Network.

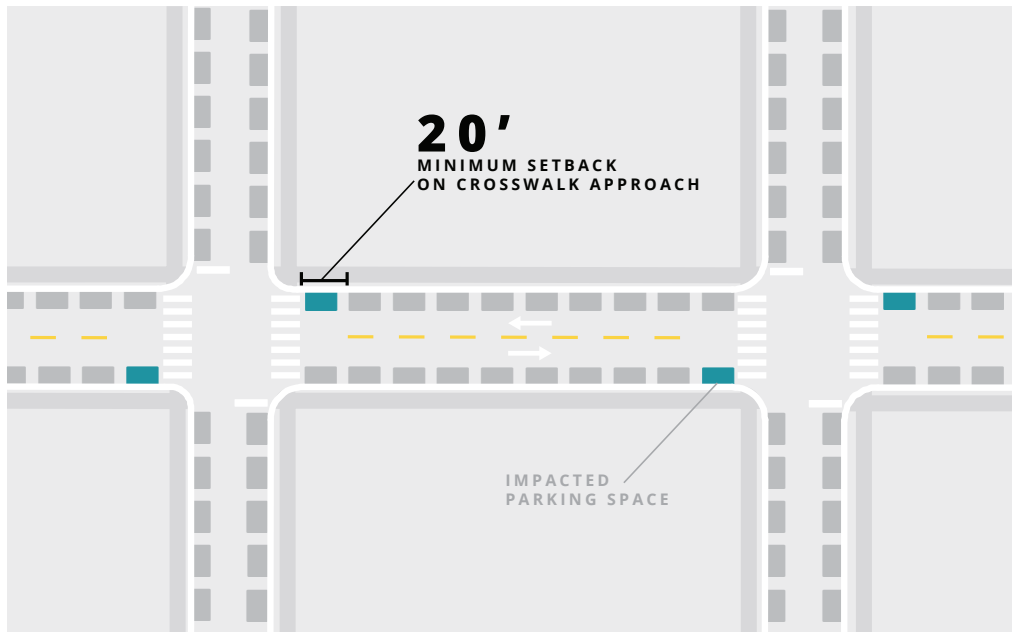
New PBOT capital projects impacting crossings, corners, and/or on-street parking will implement these new vision clearance guidelines on pedestrian priority streets when the project is constructed. PBOT's Development Review group will implement

updated vision clearance guidelines in conjunction with private frontage improvements during the public works permitting process.

Daylighting approaches to crosswalks (both marked and unmarked) by setting back on-street parking makes people crossing the street and people riding bicycles



PEDPDX OBJECTIVES ADDRESSED



Vision Clearance Diagram

more visible to people driving, and is current best practice in cities across the country¹. PBOT's new vision clearance guidelines will improve visibility for people attempting to cross pedestrian priority streets and streets within Portland's High Crash Network at marked and unmarked crosswalks. It will also improve visibility of people walking and biking along neighborhood greenways.

Considerations

New Vision Clearance Guidelines are intended to serve as a guide for capital projects moving forward and will be implemented incrementally as new right-of-way improvements are delivered and as part of the development of parking management plans. Methods for setting back parking from marked and unmarked crossing approaches include providing curb extensions

long enough to effectively meet the minimum parking setback, or providing signs prohibiting parking on the approaches to the crosswalk. Visually permeable uses such as bicycle or motorcycle parking, stormwater management facilities, and bike share stations may be provided within this required vision clearance zone.

At this time, PBOT's new Vision Clearance Guidelines apply to approaches to "uncontrolled" crossings (the legs of intersections that do not have stop signs or signals), and do not automatically apply at intersections with traffic signals or stop signs.

Outside of new capital projects, PBOT Traffic Investigations will continue to conduct engineering analysis to evaluate intersection visibility in response to public requests through the 823-SAFE hotline.

¹ ORS 811.550 prohibits on-street parking within 20 feet of a crosswalk at an intersection. While other sections of State code (ORS 810) authorize cities to establish local regulations and/or practices which may deviate, many jurisdictions follow this guidance.

Strategy 2

Improve visibility of pedestrians at crossings

ACTION 2.2

PEDPDX OBJECTIVES ADDRESSED



Identify key intersections for retroactive vision clearance improvements by Safe Routes to School, Neighborhood Greenways, Vision Zero, and Pedestrian Network Completion programs.

PBOT's new vision clearance guidelines will implement on-street parking setbacks as new capital projects are constructed and in conjunction with frontage improvements associated with private development. However, many corridors on designated routes to school, neighborhood greenways, High Crash Corridors, and on the PedPDX Pedestrian Priority Network could greatly benefit from improved vision clearance at intersections but do not currently have planned or active projects. An analysis of key corridors and intersections on these networks is needed to identify and prioritize additional locations for program-funded vision clearance improvements outside of capital projects.

PBOT Safe Routes to School, Neighborhood Greenways, Vision Zero, and Pedestrian Network Completion programs will collaboratively identify, fund, and implement intersections for retroactive vision clearance improvements along these networks.



Parked Car Blocking Visibility at Crossing

Considerations

Changes to on-street parking will impact parking availability within neighborhoods.

ACTION 2.3



Evaluate the need for vision clearance guidelines at controlled crossings and on local streets.

PBOT's new vision clearance guidelines do not currently apply to controlled crossings (intersections that have stop signs or signals) or to local streets. Vehicles parked near intersection corners on local streets and at controlled crossings may obscure views of pedestrians attempting to cross the street at stop signs and at traffic signals. It can also impede visibility of side-mounted traffic signs (such as stop signs) for people driving.

The City Traffic Engineer and PBOT Parking Management will evaluate the need for vision clearance guidelines at pedestrian crossings with stop signs and traffic signals and on local streets to improve visibility for all modes.

Considerations

Analysis to determine whether vision clearance guidelines should be extended to controlled crossings and local streets must include an engineering justification confirming the need for safety reasons. Engineering analysis may suggest that improving safety and visibility of pedestrians at intersections may be best achieved through other tools in this toolbox.

Changes to on-street parking regulations on local streets will impact parking availability within neighborhoods. New parking setback requirements at traffic signals will reduce on-street parking supply in locations with high parking demand, such as the Center City and in neighborhood retail districts. As part of this evaluation, City parking and curb space policy, actual localized parking demand, and other methods to improve visibility and safety of pedestrians at crossings should all be considered.



Parked vehicles at signalized intersections can make it difficult for people driving to see people attempting to cross the street.

Strategy 2

Improve visibility of pedestrians at crossings

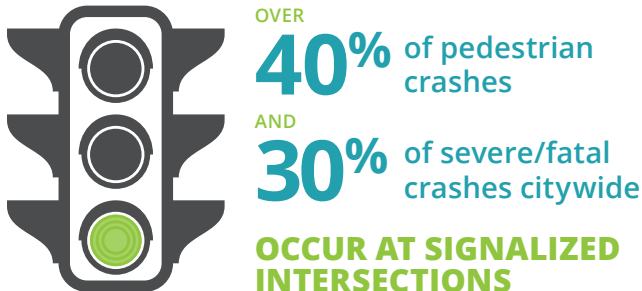
ACTION 2.4

PEDPDX OBJECTIVES ADDRESSED



Provide high visibility crosswalks at all marked crossings when restriping or providing new crosswalks.

The PedPDX Safety Analysis found that signalized intersections are not preventing pedestrian crashes in Portland. Over 40% of pedestrian crashes and 30% of severe/fatal crashes citywide occur at signalized intersections. Over a quarter of all crashes involve a turning driver failing to yield when the person walking has the right of way at the signal.



Improving the visibility of pedestrian crosswalks at signalized intersections may help make crossing pedestrians more visible to people driving. PBOT's Traffic Design Manual has historically called for crosswalk markings with two transverse lines (running perpendicular to oncoming traffic) at signalized intersections. In contrast, high visibility (or "continental") crosswalks with longitudinal lines parallel to traffic flow allow drivers to see the marked crosswalk from a greater distance. This increased visibility gives drivers more time to safely stop for a pedestrian waiting to cross. The PBOT Traffic Design Manual currently requires these high-visibility "continental" crosswalk markings at uncontrolled crossings and at school crossings where increased visibility is needed.

To increase visibility at all marked crossings, PBOT will provide high-visibility crosswalks at all marked crossings moving forward, including at traffic signals. Upon adoption of PedPDX, the City Traffic Engineer will issue a directive to make high-visibility "continental" crosswalk markings our citywide practice. This updated design practice will subsequently be integrated into an updated PBOT Traffic Design Manual. As new crosswalks are installed or reinstalled by PBOT Maintenance Operations or contractors, they will be transitioned to high-visibility markings.

Considerations

As an update to PBOT's design guidelines, changes to crosswalk markings will be implemented incrementally as crossings are installed or reinstalled moving forward.



High visibility, "continental" style crosswalk

ACTION 2.5



Clarify design guidance for tree location within the right-of-way

Street trees are a critical element of a pedestrian-friendly city. They provide a pleasant walking experience by buffering pedestrians from the roadway, provide shade along sidewalks, and introduce natural features into the public realm. Street trees help mitigate the impacts of climate change by improving local air quality and reducing the effects of urban heat islands. Trees in the right-of-way promote walking by providing shade, calming traffic, and beautifying the urban environment.

While a critical component of our urban infrastructure, vegetation in the right-of-way must be strategically sited and maintained to ensure clear visibility of people crossing the street at marked crosswalks and intersections.

PBOT staff will work with Urban Forestry to clarify existing Urban Forestry Street Tree Planting Standards in relation to pedestrian crossings on sidewalks and in medians, and collaboratively refine current guidance as appropriate. This may include clarifying where within the right-of-way trees should/should not be planted in relation to crosswalks, when and where tree limbing needs should be regularly evaluated, where particular species are preferable or should be avoided, and/or other context specific approaches for maintaining visibility of people crossing at marked crosswalks and intersections.

Considerations

Collaboratively clarifying street tree planting standards will help decrease the amount of vegetation removal and trimming at pedestrian crossings that occurs as trees become overgrown.

Strategy 2

Improve visibility of pedestrians at crossings

ACTION 2.6

PEDPDX OBJECTIVES ADDRESSED

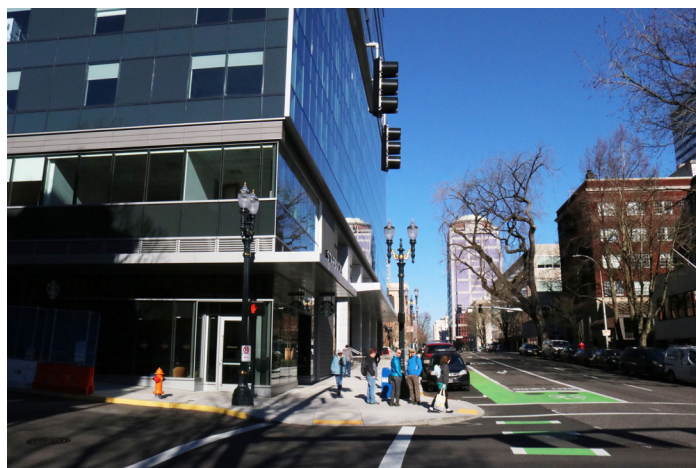


Update PBOT design guidance to maximize the use of curb extensions, floating curb extensions, and interim painted curb extensions within the Pedestrian Priority Network at both controlled and uncontrolled crossings.

Curb extensions, floating curb extensions and painted curb extensions are improvements that increase visibility of people walking to drivers and decrease the crossing distance and exposure time for pedestrians crossing the street.

Curb extensions are important at uncontrolled crossings to improve the visibility of pedestrians waiting to cross the roadway (and driver yielding), but they are also important at intersections with traffic signals and stop signs. The PedPDX Safety Analysis found that the largest proportion of pedestrian crashes in Portland occur at signalized intersections. Over a quarter of all crashes involve a turning driver failing to yield when the person walking has the right of way at the signal. Curb extensions (including floating curb extensions) help increase the visibility of pedestrians waiting to cross the roadway and may be particularly beneficial at signals where pedestrians and turning vehicles move during the same signal phase. Curb extensions can also help keep signal poles and other infrastructure out of pedestrian clear zones.

The PBOT Streets 2035 Plan will develop multi-modal decision-making frameworks for Portland rights-of-way. The PBOT modal coordinators will work with the Streets 2035 project manager and the City Traffic Engineer to develop clear design guidance for when and where curb extensions and floating curb extensions should be provided as part of capital projects and development review.



Curb extensions at signalized intersections can increase visibility of pedestrians attempting to cross the street. They also help set back vehicle parking to improve sight lines.

Considerations

While curb extensions are an important tool for enhancing pedestrian safety and comfort, they can present trade-offs that must be considered. Concrete curb extensions can preclude future bike and transit improvements. They can sometimes restrict turns for large vehicles, including buses, freight and delivery trucks, and emergency response vehicles. Floating curb extensions and interim curb extensions are two design variations that can help to address these concerns. In some locations, a pedestrian refuge median may be more desirable or appropriate.

PAGE INTENTIONALLY LEFT BLANK.

PAGE INTENTIONALLY LEFT BLANK.



STRATEGY 3

Reduce turning movement conflicts at intersections

Intersections are where pedestrians are most likely to be killed or seriously injured. This strategy aims at protecting pedestrians trying to cross at a “WALK” signal from turning cars, a problem shown in the PedPDX Safety Analysis and heard in the Disability Focus Group. Intersection design focused on turning movements can facilitate safe turning and improve pedestrian safety.

Strategy 3

Reduce turning movement conflicts at intersections

Table 10: Index of Strategy 3 Actions

ACTION	IMPLEMENTING VS. FUTURE ACTION	CATEGORY	LEADING ROLE/ COORDINATION
3.1 Develop guidelines and practices for separating vehicle turning movements concurrent with the pedestrian walk phase and incorporate signal timing analysis into capital project scopes.	Implementing Action (policy adopted with PedPDX)	Policy	City Traffic Engineer; Vision Zero; PBOT Signals and Street Lighting; PBOT Capital Delivery Division
3.2 Develop a pilot to study prohibiting “turn-on-red” within Pedestrian Districts and at High Pedestrian Crash Intersections.	Implementing Action (policy adopted with PedPDX)	Policy	City Traffic Engineer; Vision Zero; PBOT Signals and Street Lighting
3.3 Reduce uncontrolled left turn conflicts at arterial/non-arterial intersections along Major City Walkways, City Walkways, and High Crash Corridors in conjunction with capital projects.	Implementing Action (policy adopted with PedPDX)	Policy; Infrastructure	City Traffic Engineer; Vision Zero; PBOT Capital Delivery Division
3.4 Identify and fund key intersections for signal timing improvements to separate pedestrian crossing and vehicle turning movements, prioritizing high crash Intersections.	Future Action	Infrastructure	Vision Zero; PBOT Signals and Street Lighting
3.5 Use raised crosswalks to slow automobile turning movements at arterial/non-arterial intersections.	Future Action	Infrastructure	City Traffic Engineer; PBOT Pedestrian Coordinator; PBOT Capital Delivery Division

PAGE INTENTIONALLY LEFT BLANK.

Strategy 3

Reduce turning movement conflicts at intersections

ACTION 3.1

Develop guidelines and practices for separating vehicle turning movements concurrent with the pedestrian walk phase and incorporate signal timing analysis into capital project scopes.

The PedPDX Safety Analysis found that over 40% of crashes involving pedestrians occur at signalized intersections. Assignments of error for pedestrian crashes show that 8% involve a right-turning driver failing to yield and 20% involve a left-turning driver failing to yield when the person walking has the right of way. Protecting crossing pedestrians from automobile turning phases can help decrease these right and left turn conflicts.

There are a variety of tools for separating pedestrian crossing movements from vehicle turning movements, including protected left turns, protected right turns, all-pedestrian phases, leading pedestrian intervals, and protected-permissive phasing. Protected-permitted left turns area flashing yellow arrows that if concurrent with conflicting walk symbols also create a hazard and should be avoided (this is already PBOT practice). The Oregon Department of Transportation's Crash Reduction Factor Appendix cites a 37% pedestrian and bicycle crash reduction factor for leading pedestrian intervals and a 43% pedestrian crash reduction factor for installing signals with no pedestrian phase with flashing yellow arrows.

The City Traffic Engineer, PBOT Signals and Street Lighting, and Vision Zero staff will develop guidelines and practices for separating vehicle turning phases concurrent with pedestrian walks, including identifying contexts and

criteria where various treatments are appropriate and where shared phasing should be eliminated.

In the interim, PBOT Signals and Street Lighting and the City Traffic Engineer will generally not approve permissive left turns at new signals across Major City Walkways (or Bikeways), unless engineering judgment justifies the treatment. PBOT will utilize ODOT guidelines and practices for separating vehicle turning phases from opposing through traffic. PBOT Signals and Street Lighting will continue to use PBOT's Leading Pedestrian Interval (LPI) Guidelines to identify opportunities to provide LPis.

These guidelines will consider PedPDX classifications and designated pedestrian high crash intersections as a factor. The decision to separate pedestrian crossing phases from vehicle turning phases should largely be a function of where we have seen or predict pedestrian safety concerns.

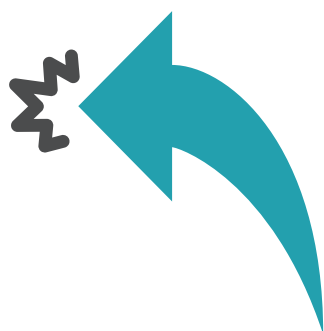
Once developed, PBOT Complete Streets will incorporate new signal timing guidelines into the PBOT project development checklist to inform project scoping needs.

PEDPDX OBJECTIVES ADDRESSED



20% OF ALL PEDESTRIAN CRASHES

involve a **left-turning driver failing to yield** to a person walking who has the right of way



8% OF ALL PEDESTRIAN CRASHES

involve a **right-turning driver failing to yield** to a person walking who has the right of way



Considerations

There are a number of trade-offs to be considered when determining how to effectively set signal timing to maximize safety and efficiency for all road users. Giving more walk time to pedestrians will have an impact on traffic flows, including transit vehicles and people biking. Increasing the overall length of time it takes for a signal to move through a cycle length will increase wait time for all users, including pedestrians, which can lead to less efficient crossings and non-compliant movements. Turn pockets needed for protected turning phases require sufficient right-of-way width, which is not always available. Changing the signal timing at one location could lead to a ripple impact to dozens of nearby signals.

Tools for separating pedestrian crossing movements from vehicle turning movements:

PROTECTED (OR PROHIBITED) LEFT TURNS:

Turning vehicle has a green left-turn signal and pedestrians are not permitted to cross (as opposed to an unprotected turn, when turning vehicles have a green light and must yield to oncoming traffic and pedestrians typically have a "WALK" signal, which creates a potential conflict for pedestrians and turning vehicles). Prohibited left turn movements may be an appropriate tool where there is not adequate space for a left turn pocket.

PROTECTED RIGHT TURNS:

Protected right turns are similar to protected left turns in that they hold vehicles from turning right with a red light to provide pedestrians with a "WALK" signal. This prevents pedestrians from sharing a traffic

phase with right-turning vehicles. When vehicles have a green right turn arrow, pedestrians are not permitted to cross. The addition of a "NO TURN ON RED" sign may also be used.

ALL-PEDESTRIAN PHASES:

Stops all motor vehicle movement and allows pedestrians to cross in any direction at the intersection, including diagonally.

LEADING PEDESTRIAN INTERVALS:

Gives pedestrians a 3-10 second head start when entering an intersection.

PROTECTED PERMISSIVE PHASING:

Motor vehicles are given two phasings. In a "permissive/protected" mode, the permissive left-turn phase is immediately followed by an exclusive, protected left-turn phase, initiated by a green arrow signal indication.

Strategy 3

Reduce turning movement conflicts at intersections

ACTION 3.2

PEDPDX OBJECTIVES ADDRESSED



Develop a pilot to study prohibiting “turn-on-red” within Pedestrian Districts and at High Pedestrian Crash Intersections.

Allowing rights on red is common throughout the city. Left turns on a red light are also allowed when the driver is turning onto a one-way street, which is common downtown. To make these movements, drivers must pull forward into the crosswalk to look for a gap in on-coming traffic, into and across the path of pedestrians who have a “walk” signal. This can create a dangerous situation if the driver does not see a pedestrian entering the crosswalk. It is particularly dangerous for blind pedestrians, who do not receive visual clues (through signals or eye contact with the driver) that the driver intends to turn against the signal. Furthermore, drivers looking for gaps in traffic to make the turn do not always look the opposite direction to check for crossing pedestrians before making the turn against the signal.

As part of the PedPDX public outreach, members of Portland’s disability community in particular have expressed strong support for eliminating “turn-on-red.” Engineering studies show a significant increase in pedestrian crashes where “right-on-red” is permitted ¹². The City Traffic Engineer, PBOT Signals and Street Lighting, and Vision Zero staff will develop a pilot to study prohibiting “turn-on-red” in high pedestrian demand districts and/or at pedestrian high crashes intersections. The pilot study will establish evaluation criteria and based on the findings of the pilot the City Traffic Engineer may consider permanent prohibitions on “turn-on-red” at key locations.



No Turn on Red

Considerations

A pilot study will allow PBOT to monitor what impact prohibiting “turn-on-red” might have on pedestrian safety and automobile congestion. It will also offer an opportunity to monitor driver compliance. The pilot study should be coupled with education about the safety concerns underlying the study, as well as enforcement for non-compliance.

¹ 10% increase in right turn crashes where right turn on red is permitted - Handbook of Road Safety Measures, Elvik, R. and Vaa, T., 2004

² 69% increase in vehicle/bike and vehicle/pedestrian crashes (all severities) – Highway Safety Manual, 1st Edition, 2010

ACTION 3.3



Reduce uncontrolled left turn conflicts at arterial/non-arterial intersections along Major City Walkways, City Walkways, and High Crash Corridors in conjunction with capital projects.



33% of fatal and serious injury crashes

OCCUR AT UNCONTROLLED INTERSECTIONS

(intersections with no stop signs or traffic signals)

The PedPDX Safety Analysis found that 27.5% of all crashes and 33% of fatal and serious injury crashes occur at uncontrolled intersections (intersections without a stop sign or traffic light). Many of these crashes occur when drivers are looking for gaps in oncoming traffic to make a left turn and do not see pedestrians crossing streets and driveways. This can happen when drivers are turning left off of major arterials onto local streets and driveways, and where drivers are turning from local streets onto major arterials.

Reducing the number of potential vehicle turning movements at uncontrolled intersections can help prevent pedestrian crashes. Medians within the arterial roadway that span across the intersection with the local street prevents unexpected vehicle turning movements at uncontrolled intersections that pedestrians must contend with, allowing pedestrians to more safely walk along the arterial street. Medians also provide opportunities for enhanced pedestrian crossings by creating space for a refuge island. In the absence of central median islands or diverters, left turn restrictions can also help reduce uncontrolled left turns and create a safer walking environment along the roadway.

As part of PBOT capital projects, project managers will evaluate opportunities to apply left turn restrictions on Major City Walkways, City Walkways, and on High Crash Corridors. The analysis will be included in the PBOT Project Development Checklist to help identify project scope.

Considerations

Medians, diverters, and left turn restrictions disallow uncontrolled left turns, forcing drivers a block or two out of direction to make a left turn or u-turn. This can lead to slightly longer driving times and potential delay at traffic signals. Left turn restrictions should be context driven to ensure there is reasonable access to and through neighborhoods.



Median diverters at arterial / non-arterial intersections reduce the number of conflicts with turning vehicles that pedestrians must contend with and provide a central refuge to make crossings safer and more comfortable.

Strategy 3

Reduce turning movement conflicts at intersections

ACTION 3.4

PEDPDX OBJECTIVES ADDRESSED

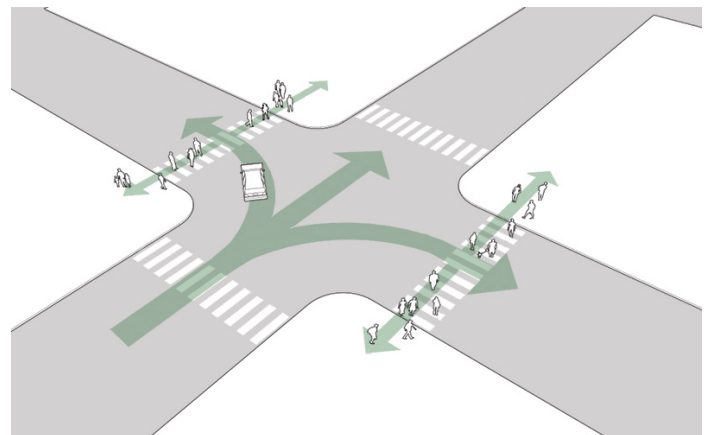


Identify and fund key intersections for signal timing improvements to separate pedestrian crossing and vehicle turning movements, prioritizing high crash intersections.

In addition to implementing signal timing improvements through capital projects, PBOT Signals and Street Lighting and Vision Zero staff will collaboratively identify locations, particularly at high crash intersections, where separating pedestrian crossing and vehicle turning movements could decrease vehicle/pedestrian conflicts. The Vision Zero and Signals and Street Lighting will advocate for funding for these programmatic improvements at pedestrian high crash intersections as needed.

Considerations

While some retroactive signal timing improvements may be simple changes to signal timing, locations where new signal heads, right-of-way, roadway striping, or new signal technology is needed will be more costly and will depend upon available funding.



Signal Phasing Diagram

ACTION 3.5



Use raised crosswalks to slow automobile turning movements at arterial/non-arterial intersections.

Raised crosswalks bring pedestrian street crossings to be level with the sidewalk and street curb. Raising crosswalks offers numerous benefits. They can improve accessibility and eliminate the need for curb ramps by keeping the sidewalk and the roadway crossing at the same grade. Raised crosswalks also make pedestrians slightly more visible to people driving and provide traffic calming by slowing vehicle turning movements as the move from higher speed arterial streets onto slower speed local streets. While not a common design in Portland at this time, raised crosswalks are used at arterial/local street intersections in cities across the world.

The Portland Protected Bicycle Lane Planning and Design Guide identifies sidewalk-level bikeways as one of Portland's preferred bikeway designs. Raised crossings can also be built as a part of these projects, offering safer roadway for multiple modes.

The City Traffic Engineer and Pedestrian Coordinator will develop design guidelines and criteria identifying where raised crosswalks should be considered when scoping and constructing capital projects. The Pedestrian Coordinator will integrate these criteria into the PBOT project development checklist to inform capital project scopes.

Considerations

As non-traditional designs, raised crosswalks should be designed to be accessible and legible to disabled pedestrians.



Raised Crosswalk

PAGE INTENTIONALLY LEFT BLANK.



STRATEGY 4

Improve pedestrian safety and comfort at crossings and transit stations

Improving the safety and comfort at crossing locations and transit stations will improve the pedestrian experience for all. Actions related to increasing pedestrian safety and comfort included to implement this strategy include continuing to test passive detection technology at pedestrian crossings to eliminate the need for pedestrian push buttons and ensure adequate crossing time, evaluating current crosswalk design guidance, and developing City guidance for transit station design.

Strategy 4

Improve pedestrian safety and comfort at crossings and transit stations

Table 11: Index of Strategy 4 Actions

ACTION	IMPLEMENTING VS. FUTURE ACTION	CATEGORY	LEADING ROLE
4.1 Continue to test passive pedestrian detection technology.	Implementing Action (policy adopted with PedPDX)	Policy	PBOT Signals and Street Lighting
4.2 Evaluate the need to update crosswalk design guidelines at uncontrolled multi-lane crossings.	Implementing Action (policy adopted with PedPDX)	Policy	City Traffic Engineer; Vision Zero; PBOT Signals and Street Lighting
4.3 Develop City design guidance for transit station platforms that maximize safety and comfort for people walking, biking, and taking transit.	Future Action	Infrastructure Policy	PBOT Complete Streets

PAGE INTENTIONALLY LEFT BLANK.

Strategy 4

Improve pedestrian safety and comfort at crossings and transit stations

ACTION 4.1

Continue to test passive pedestrian detection technology.

Manual actuation and detection of pedestrian signals at crossings require a person to find, and physically push a pedestrian pushbutton to place a call for a pedestrian “WALK” phase in the traffic signal cycle. Pedestrian pushbuttons are often used at streets with high vehicle volumes, and when pushed activate the red signal for motor vehicles, allowing the pedestrian to cross the street on demand. However, many pedestrians do not activate pushbuttons when present. Furthermore, pushbuttons sometimes do not provide feedback to the user that the button has been activated and is operating properly. If a person waiting to cross the street does not realize the need to push a button to activate the pedestrian crossing phase, the person may have to wait a full additional signal cycle for a “WALK” indication.

In areas with high pedestrian volumes, pedestrian crossing phases are typically automatically activated as part of every signal cycle. The automatic “WALK” phase obviates the need for a manual pushbutton and eliminates any uncertainty of detection. However, there are many instances in which a pedestrian actuated crossing may be preferable to an automatic “WALK” phase. In locations with high vehicle volumes, pedestrian actuated pushbuttons can decrease pedestrian waiting times over an automatic pedestrian “WALK” phase.

Passive pedestrian detection could help register the presence of a person wishing to cross the street without requiring the pedestrian to push a button, thereby making traffic signals automatically responsive to pedestrian crossing demand. A successful passive pedestrian



Manual Pedestrian-Actuated “Walk” Pushbutton

PEDPDX OBJECTIVES ADDRESSED



technology could also potentially detect in real time how quickly pedestrians are crossing the roadway, and adjust the “WALK” phase to adjust to the pedestrian rate of travel.

However, despite the promise and potential utility of passive pedestrian detection, a reliable technology has not yet been developed and tested and approved by PBOT Maintenance staff. PBOT Signals and Street Lighting staff have been consistently testing new technologies for detecting pedestrians at crossings, and will continue to monitor and evaluate this technology as it continues to develop.

Considerations

When activated, APS features provide audible and tactile information about the crossing to pedestrians who are blind or have low vision. They provide a voice announcement indicating when to walk and when the crossing is in the don’t walk condition.

Even at intersections without manual pedestrian detection, the US Access Board Public Right-of-Way Design Guidelines recommend that all signalized intersections provide Accessible Pedestrian Signals. The City of Portland currently has around 300 intersections equipped with some form of Accessible Pedestrian System. PBOT Signals and Street Lighting evaluates locations for audible pedestrian signals based on resident request.

Non-actuated WALK phases should be the preferred practice within Pedestrian Districts. When not provided a clear reason for doing otherwise should be provided.

Strategy 4

Improve pedestrian safety and comfort at crossings and transit stations

ACTION 4.2

Evaluate the need to update crosswalk design guidelines at uncontrolled multi-lane crossings.

Every intersection, and certain midblock locations, are legal crosswalks in Oregon (ORS 801.220). Crosswalks vary in their design; some are unmarked, while others have stop lines, median islands, rapid flashing beacons or other elements that can improve safety at pedestrian crossings.

PBOT's crosswalk design guidelines tailors each crosswalk's design to its location based on engineering studies. In general, roadways with more travel lanes, higher speeds and a greater number of people driving, walking and biking need extra elements to meet safety guidelines.

While engineering best practice may indicate that a marked crossing or flashing pedestrian beacon sufficiently meets safety criteria on roadways with multiple travel lanes, these types of crossing treatments may not always eliminate "double threat" situations for people trying to cross the street (City of Portland crash data does not show an increase in crashes where rapid flashing beacons have been installed on multi-lane roadways). A double threat exists on multi-lane crossings where a person crossing the roadway is blocked from the view of other approaching motorists by a stopped vehicle.

Crossing treatments that provide a full stop indication for vehicles, such as full signals, half signals, or pedestrian hybrid beacons could help address potential double threat crossings on multi-lane roadways. These devices can also be coordinated to help facilitate transit mobility and control travel speeds, and may be a better choice than rapid flashing beacons in locations where traffic



RRFB with Median Refuge Island



Half Signal



Full Signal

³ NCHRP Report 562, "Improving Pedestrian Safety at Unsignalized Crossings," 2005, National Cooperative Highway Research Program

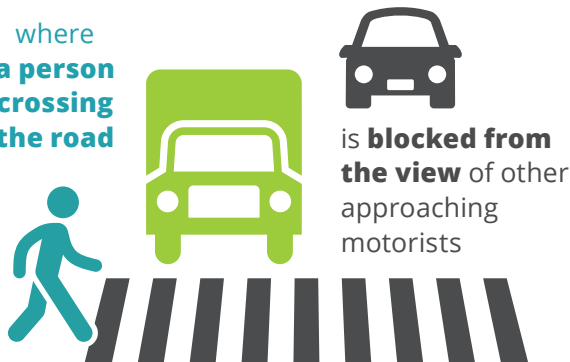
⁴ FHWA-HRT-04-100, "Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations Final Report and Recommended Guidelines," 2005.

PEDPDX OBJECTIVES ADDRESSED



A DOUBLE THREAT EXISTS ON MULTI-LANE CROSSINGS

where
a person
crossing
the road



is **blocked from the view** of other approaching motorists

BY A STOPPED VEHICLE.

volumes are projected to increase over time. Median refuge islands, which allow pedestrians to cross one lane of traffic at a time, could also be appropriate at multi-lane crossings.

The City Traffic Engineer and Vision Zero and Signals and Street Lighting staff will evaluate whether existing PBOT crossing design guidelines should be updated to eliminate uncontrolled multi-lane crossings where a potential “double threat” condition occurs, either by reducing the number of vehicle lanes a person must cross at a time or by providing a full stop indication to vehicles.

Considerations

Portland’s crossing design guidelines stem from engineering research and national best practice³⁴. Any refinements to existing City of Portland design guidelines to require higher-order pedestrian infrastructure at multi-lane crossings would effectively go above and beyond current engineering best practice.

CROSSWALK DESIGN BY ROADWAY TYPE*

	VEHICLE ADT > 4,000 - 9,000			VEHICLE ADT > 9,000 -12,000			VEHICLE ADT > 12,000 -15,000			VEHICLE ADT > 15,000		
	≤30 MPH	35 MPH	40+ MPH	≤30 MPH	35 MPH	40+ MPH	≤30 MPH	35 MPH	40+ MPH	≤30 MPH	35 MPH	40+ MPH
TWO LANES	●	●	●	●	●	●	●	●	●	●	●	●
THREE LANES WITH RAISED MEDIAN	●	●	●	●	●	●	●	●	●	●	●	●
THREE LANES WITHOUT RAISED MEDIAN	●	●	●	●	●	●	●	●	●	●	●	●
MULTILANE WITH RAISED MEDIAN	●	●	●	●	●	●	●	●	●	●	●	●
MULTILANE WITHOUT RAISED MEDIAN	●	●	●	●	●	●	●	●	●	●	●	●

* All crossings must be scoped by an engineer to ensure recommended treatment is appropriate and ADA ramps and illumination are in place.

- Marked Crosswalk
- Marked Crosswalk, island or curb extensions, enhanced signing and striping
- Marked Crosswalk and enhanced/active warning (islands and RRFB's)
- Marked Crosswalk and pedestrian hybrid or full signal



The City has developed crosswalk design guidance by roadway type which indicates the appropriate type of crosswalk to install based on the number of lanes, posted speed, and average daily traffic of a roadway. PedPDX assesses the design of existing marked crossings on priority streets to identify those that do not meet current guidelines.

Strategy 4

Improve pedestrian safety and comfort at crossings and transit stations

ACTION 4.3



Develop City design guidance for transit station platforms that maximize safety and comfort for people walking, biking, and taking transit.

As Portland's population grows and the number of people walking, biking, and using transit increases, these three modes can sometimes compete for limited space in the right-of-way. One particular design challenge faced by planners and engineers is how to design transit stops that reduce conflict between people walking, biking, and taking transit. Portland has yet to develop strong design guidance for transit station design where bicycle lanes exist, but three main designs have emerged in recent years that warrant further refinement and standardization, including island transit platforms, bicycle bypasses, and bikes behind step out zone.

PBOT's design preference is always for clear separation between people walking and people bicycling. This includes at transit stops, where PBOT's preferred design is the island transit platform. Portland has already successfully implemented this design in a few locations along Moody Avenue. In this design, passengers board from and alight to a transit platform. A through bicycle lane, which can be either at street or sidewalk level, runs behind the platform and the sidewalk continues adjacent to building frontages. This design offers the highest level of protection and separation between modes and provides a space for waiting transit patrons that is separated from through-pedestrians on the sidewalk, but typically comes at the highest cost and uses the most right-of-way space.



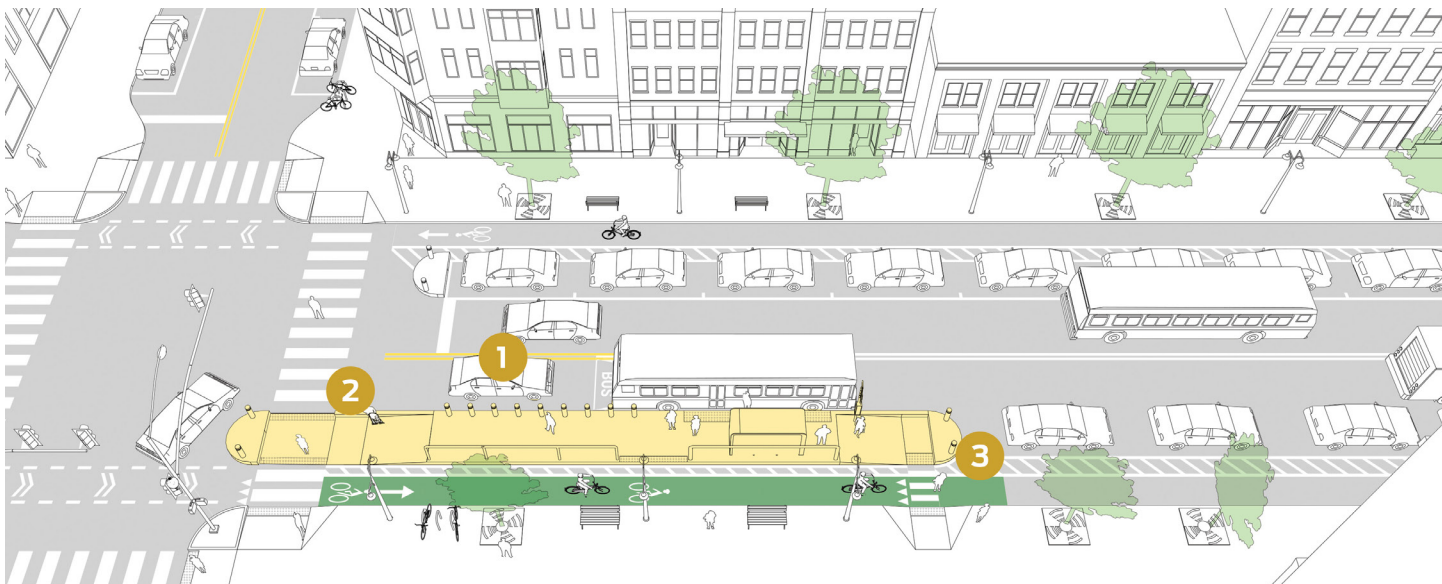
Island Transit Platform in Portland on SW Moody Ave



Bicycle Bypass in Seattle



Bikes Behind Step Out in Toronto (Photo from NACTO)



Island Transit Platform (Image from NACTO Transit Street Design Guide)

Where right-of-way space is constrained, bicycle bypasses should be considered. This design is very similar to the island transit platform, with the difference being that the bike lane deflects to move around the transit station platform. With this design, it is especially important that objects like transit shelters, poles, and vegetation do not block sight lines and allow people biking and people stepping onto the platform to see each other.

The least preferred option is the bikes behind step out zone design, which eliminates the island, forcing transit passengers to board directly from the bike lane or onto a small “step out” zone. Transit stations are typically integrated into the sidewalk corridor. This design should only be considered where right-of-way or budget constraints do not allow for a full transit island or where volumes of people walking and biking are expected to be extremely low, as it does not denote clear separation between people walking or waiting for transit service and people biking.

As the City and the region continue to test and review the performance of these various transit station design types, the PBOT Complete Streets team will solidify any “lessons learned” into clear design guidance for transit stations in Portland. This design guidance will clarify that island transit platforms are the preferred treatment for pedestrian safety and comfort, as well as for people riding bicycles and taking transit.

Considerations

Project budget and right-of-way constraints will typically be the determining factor in transit station design. Regional partners will need to come to a consensus about the detailed design elements for each of these station standards, as well as the order of preference for station types.

PAGE INTENTIONALLY LEFT BLANK.



STRATEGY 5

Seek cost-effective and creative solutions to provide pedestrian improvements

Thinking creatively can result in the installation of more sidewalks through the utilization of low-cost and interim solutions. Responses from the Walking Priorities Survey cited missing and poorly maintained infrastructure as key factors creating difficult walking conditions citywide. The PedPDX Advisory Committees voiced support for near-term strategies and actions to address infrastructural gaps to avoid long funding and design processes. Cost effective and creative solutions entail leveraging existing signals and infrastructure, and combine projects with planned infrastructure improvements.

Strategy 5

Seek cost-effective and creative solutions to provide pedestrian improvements

Table 12: Index of Strategy 5 Actions

ACTION	IMPLEMENTING VS. FUTURE ACTION	CATEGORY	LEADING ROLE
5.1 Provide lower-cost pedestrian walkways.	Implementing Action (policy adopted with PedPDX)	Policy; Infrastructure	City Traffic Engineer; PBOT Civil Engineering Services; Safe Routes to School; Neighborhood Greenways; PBOT Pedestrian Coordinator; PBOT Capital Delivery Division; PBOT Maintenance
5.2 Provide interim pedestrian improvements.	Future Action	Infrastructure	City Traffic Engineer; Safe Routes to School; Neighborhood Greenways; PBOT Pedestrian Coordinator; PBOT Maintenance
5.3 Leverage paving projects for pedestrian improvements.	Implementing Action	Infrastructure	PBOT Pedestrian Coordinator; Safe Routes to School; Neighborhood Greenways; Vision Zero
5.4 Convert existing fire signals to pedestrian crossings to help meet crossing spacing guidelines.	Implementing Action	Infrastructure	PBOT Signals and Street Lighting; PBOT Pedestrian Coordinator
5.5 Leverage bicycle infrastructure to also serve pedestrians, including neighborhood greenways.	Future Action	Infrastructure	PBOT Pedestrian Coordinator; PBOT Bicycle Coordinator; Neighborhood Greenways
5.6 Improve unimproved rights-of-way for pedestrian travel.	Implementing Action	Infrastructure	Portland Pathways; Safe Routes to School; PBOT Pedestrian Coordinator

ACTION 5.1

PEDPDX OBJECTIVES ADDRESSED



Provide lower-cost pedestrian walkways.

The PedPDX needs analysis shows there are still approximately 350 linear miles of sidewalk missing on Portland's busy arterial and collector streets. These remaining sidewalk gaps are often some of our most expensive needs, as many of these locations also lack stormwater infrastructure and sufficient right-of-way width, and/or have substantial physical or environmental constraints that make traditional pedestrian infrastructure cost-prohibitive.

Because of the expense of traditional sidewalks, addressing this need with traditional concrete sidewalks will take many years, likely much longer than the 20-year horizon of this plan. A review of all sidewalk construction activity between 1998 through 2008 during the 20-year lifespan of Portland's original Pedestrian Master Plan found that during that time a total of approximately 250 miles of sidewalk were constructed or repaired. This includes all sidewalks constructed or repaired by the City and by private property owners and developers.

Portland residents cannot wait another 20 years or more to address gaps in the sidewalk network, particularly on our busiest streets. Providing lower-cost pedestrian walkways will allow us to provide critical pedestrian safety improvements sooner to more residents who need them now. In addition to costing less than a traditional concrete sidewalk with a full curb and gutter, lower-cost pedestrian walkways can also be a more context-sensitive approach for providing pedestrian walkways in neighborhoods.

Lower-cost and alternative walkway designs are not new to Portland. Most of the alternative walkway design types presented in this Toolbox were included in the 1998 Pedestrian Design Guide. PedPDX has worked together with PBOT Planning, the City Traffic Engineer, and the City Engineer to clarify the design elements for each of the

alternative pedestrian design walkway types, as well as the roadway and traffic thresholds where these alternative designs are appropriate. Moving forward, PBOT programs providing pedestrian improvements (including Safe Routes to School, Vision Zero, Neighborhood Greenways, Neighborhood Streets, and the Pedestrian Network Completion Program) and PBOT's Civil Engineering Services will apply the alternative pedestrian walkway design types to sidewalk gaps in these programs' respective networks, as guided by the roadway and traffic criteria described for each. The pages appended to the end of this Toolbox describe the alternative pedestrian walkway design types that PBOT will apply to the pedestrian network, including key design elements, appropriate roadway types, and vehicle speed and volume thresholds for each.

THERE ARE
(approx.)
350
LINEAR MILES OF SIDEWALK MISSING
on Portland's busy streets
(arterial and collector streets)

Considerations

The criteria described within each of the alternative pedestrian design types are intended to serve as guidelines. Local context will be considered during engineering and design. As non-traditional pedestrian walkways, each of these design types must accommodate and be legible to pedestrians with disabilities.

Strategy 5

Seek cost-effective and creative solutions to provide pedestrian improvements

ACTION 5.2

PEDPDX OBJECTIVES ADDRESSED



Provide interim pedestrian improvements.

Concrete pedestrian infrastructure such as curb extensions and pedestrian refuge islands can be expensive. In some cases, a temporary or interim treatment provided with low-cost materials such as paint and delineator posts can help provide more pedestrian improvements in more locations while waiting for funding to provide permanent concrete infrastructure. These sorts of lower-cost treatments may also be used to test a configuration and allows us to make adjustments before a design is permanently constructed. Interim pedestrian infrastructure such as painted curb extensions can be initiated and provided by PBOT as part of a capital improvement or initiated by residents and implemented through PBOT's Portland in the Streets program (discussed further in Strategy 10).

The City Traffic Engineer will provide guidance to indicate where interim pedestrian infrastructure is appropriate and to clarify acceptable design treatments, including requirements for durable, slip resistant pavement markings. PBOT Safe Routes to School, Neighborhood Greenways, Vision Zero, and Pedestrian Network Completion programs will identify, fund, and implement low-cost pedestrian improvements as appropriate.

Considerations

Interim painted pedestrian infrastructure should be considered supplemental to other treatments that are required to meet minimum safety requirements per engineering studies. Painted curb extensions or refuge islands should not be used to meet minimum safety requirements and must be designed to be accessible and legible to pedestrians with disabilities. Painted curb extensions and refuge islands will require on-going maintenance, including sweeping and clearing dust and debris, and occasional repainting.



Interim Pedestrian Median Refuge



Painted Pedestrian Refuge

ACTION 5.3

PEDPDX OBJECTIVES ADDRESSED



Leverage paving projects for pedestrian improvements.

When roads are repaved, maintenance crews install roadway striping and construct or improve corner curb ramps to meet current standard. Leveraging this new striping and expensive curb ramp work to also provide pedestrian crossing or walkway improvements in conjunction with paving projects allows us to stretch our dollar and provide more. There are also costs savings from taking advantage of work crews already being mobilized and on-site.

In the past, PBOT's Bicycle Missing Links Program has successfully leveraged paving projects to help fill small gaps in the bike network, but this same approach has not been used to identify needed marked crossings and other pedestrian improvements. Paving projects should be evaluated from a complete streets perspective, identifying opportunities to reconfigure newly paved roadways in ways that enhance safety for all road users. Moving forward, PBOT Safe Routes to School, Neighborhood Greenways, Vision Zero, and Pedestrian Network Completion programs will review PBOT paving projects to collaboratively identify, fund, and implement prioritized pedestrian improvements in conjunction with paving projects.

Considerations

The PBOT Maintenance and Operations Division establishes the schedule for when roads will be paved. If needed improvements for paving projects become too large and require extensive public involvement, these projects should move to the Capital Delivery Division and become full capital projects.

Strategy 5

Seek cost-effective and creative solutions to provide pedestrian improvements

ACTION 5.4

PEDPDX OBJECTIVES ADDRESSED



Convert existing fire signals to pedestrian crossings to help meet crossing spacing guidelines.

Portland is home to 31 fire stations, many with its own fire signal that allows emergency vehicles quick access out of the station when emergencies arise. These signals often do not have pedestrian crossing infrastructure but are readily equipped with much of the most costly infrastructure such as poles and signal cabinets that would be necessary to provide a signalized crossing. Providing pedestrian crossing infrastructure at each of these existing fire signals could help close crossing gaps in the pedestrian network for less cost than constructing an entirely new signal. PBOT Signals and Street Lighting staff have successfully converted several fire signals to pedestrian crossings across the city over the last several years. The PBOT Pedestrian Coordinator will identify the location of existing fire signals not yet converted to pedestrian crossings and will work with PBOT Signals and Street Lighting and PBOT capital project managers to develop a strategic plan for updating these to pedestrian crossings.

Considerations

Converting fire signals to pedestrian crossings could occur as part of a PBOT capital project or could be initiated and funded through PBOT programs including by PBOT Signals and Street Lighting and/or the Pedestrian Network Completion Program. Converting fire signals to pedestrian crossings will require coordination with the Portland Fire

Bureau. Revising existing fire station signals (many of which are old installations on span wires) to accommodate pedestrian crossings could lead to a full replacement of the signal equipment, new ADA corner curb ramps, and other infrastructure improvements to accommodate the new crossing.



A fire signal was converted to serve as a pedestrian crossing on NE Sandy

ACTION 5.5



Leverage bicycle infrastructure to also serve pedestrians, including neighborhood greenways.

Multi-modal design solutions provide added safety benefits and cost-efficient solutions for multiple modes. For example, bicycle signals that hold vehicle turning movements so people cycling can move through the intersection also provide a protected phase for pedestrians crossing the street. Similarly, infrastructure associated with protected bicycle lanes separates people cycling from moving vehicles, but can also serve as a pedestrian refuge island at intersections to help increase visibility of pedestrians and close crossing distances and pedestrian exposure time. The PBOT Bicycle Coordinator, Pedestrian Coordinator will collaborate during project development and design to maximize opportunities to provide bicycle and pedestrian infrastructure that jointly addresses the safety and comfort of both modes. Strategic coordination among PBOT staff that focus on each of these modes will create opportunities for leveraging investments and finding cost-efficient ways to integrate pedestrian improvements into bikeways.

PBOT's Neighborhood Greenways Program also presents an opportunity to develop safety improvements that serve both people walking and people riding bikes. Neighborhood Greenways are residential streets with low volumes of auto traffic and low speeds where bicycles and pedestrians are given priority. Neighborhood Greenways improvements typically include reducing automobile speeds and volumes on designated streets using speed bumps and traffic diverters, providing pavement markings and signage alerting people driving to expect people bicycling, and providing crossing treatments at busy arterial and collector streets to help people walking and bicycling cross.

While Neighborhood Greenways provide traffic calming and crossing improvements that benefit people walking,

due to cost the program has not traditionally provided new sidewalks where pedestrian walkways are missing on designated greenways. Because of their many walking benefits, PedPDX includes designated Neighborhood Greenways within the Pedestrian Priority Network as Neighborhood Walkways. Moving forward, the Neighborhood Greenways program and capital project managers in PBOT's Capital Delivery Division will evaluate opportunities to provide pedestrian walkways as part of Neighborhood Greenway improvements. This could include applying lower-cost, alternative pedestrian walkway design types.

Considerations

Neighborhood Greenway improvements have traditionally been a low-cost tool for improving local streets for bicycle travel. Increasing the scope of Neighborhood Greenways project to also include pedestrian walkway improvements, even alternative pedestrian walkway treatments, may require an increase to project budgets. This is particularly true as Neighborhood Greenway projects continue to extend beyond inner Portland into East and Southwest Portland where there are significant gaps in the pedestrian network.



Protected Bike Lane/ Pedestrian Refuge Island

Strategy 5

Seek cost-effective and creative solutions to provide pedestrian improvements

ACTION 5.6



Improve unimproved rights-of-way for pedestrian travel.

Unimproved rights-of-way are street segments that have a dirt, gravel, or substandard pavement surface and typically lack curbs. Sometimes unimproved rights-of-way are completely unimproved and are merely platted “paper streets” with no walking or driving surface at all.

Unimproved rights of way that are too narrow or that are topographically challenged such that they cannot be improved to accommodate vehicles are often good candidates for sidewalk infill, pathways, stairways, or other alternative walkway treatments. These underutilized right-of-way segments can present low-cost opportunities to increase pedestrian connectivity, particularly in neighborhoods where the street grid is irregular or widely spaced and pedestrian connectivity is limited. Providing pedestrian walking improvements on these rights-of-way presents a cost savings over improving the street for all modes, including vehicle traffic. Since many of these unimproved rights-of-way tend to be narrow, they can often serve as designated, pedestrian-only paths.

PedPDX identifies several unimproved rights-of-way and pedestrian-only paths in the right-of-way as part of the Pedestrian Priority Network. As such, these designated Neighborhood Walkways are eligible for public funding as part of a PBOT led capital improvement. PBOT’s Safe Routes to School and Pedestrian Network Completion program will consider these unimproved Neighborhood Walkways when prioritizing funding for capital improvements.

To support communities interested in developing neighborhood trails, the PBOT’s Portland in the Streets Program provide a path by which community groups

may propose, permit, build, and maintain pedestrian trails on public rights-of-way. Unimproved rights-of-way not identified as part of the PedPDX Pedestrian Priority Network may be improved by community partners using the Portland in the Streets permitting program and process.

Considerations

As an alternative, low-cost treatment, design guidelines for pedestrian paths are presented in Action 5.1. Pedestrian paths should consider lighting needs, particularly when serving as walking route to school. Where topography is steep, a staircase may be provided when an accessible route is provided on the nearest full street connection.

Improving rights-of-way for pedestrian travel likely leads to a need for new lighting.



Paved Pedestrian Path

PAGE INTENTIONALLY LEFT BLANK.

PAGE INTENTIONALLY LEFT BLANK.



STRATEGY 6

Provide adequate street lighting for pedestrians

Poor lighting is one of the top pedestrian difficulties in Portland, according to the Walking Priorities Survey and the Walking While Black Focus Group. The PedPDX Safety Analysis found that streetlights are present in crashes after dark, suggesting that existing streetlights alone are not sufficient to ensure motorists and pedestrians see each other. Since lighting may require construction to install, actions to integrate it as a component of development projects will work to improve lighting conditions incrementally. This can be paired with a separate lighting plan for under-served or high-crash areas, as well as design guidelines for implementation.

Strategy 6

Provide adequate street lighting for pedestrians

Table 14: Index of Strategy 6 Actions

ACTION	IMPLEMENTING VS. FUTURE ACTION	CATEGORY	LEADING ROLE
6.1 Implement new lighting level guidelines in conjunction with capital projects and private development.	Implementing Action	Infrastructure	PBOT Signals and Street Lighting; PBOT Capital Delivery Division; PBOT Development Review
6.2 Strategically improve street lighting conditions to increase visibility of (and for) pedestrians on our streets, focusing investment on High Crash Corridors and locations, Pedestrian Priority Streets, and underserved areas.	Future Action	Funding	PBOT Signals and Street Lighting; Vision Zero
6.3 Address locations where street lighting is blocked by tree canopy.	Implementing Action	Maintenance	Urban Forestry; PBOT Signals and Street Lighting

PAGE INTENTIONALLY LEFT BLANK.

Strategy 6

Provide adequate street lighting for pedestrians

ACTION 6.1

Implement new lighting level guidelines in conjunction with capital projects and private development.

During the PedPDX public outreach process, Portland residents voiced a strong desire to increase the amount of lighting on our streets. Dark streets and sidewalks can impact residents' sense of safety and personal security in the public realm, while dark crossings and intersections can significantly reduce visibility of people crossing the street and contributes to the rate and severity of pedestrian crashes. In particular, feedback from the "Walking While Black" focus group highlighted the impact that dark streets have not only on traffic safety, but on personal safety and security in the public realm. Participants identified poor lighting as the top barrier to walking in Portland. Focus group discussion about poor lighting conditions revealed that while increasing visibility of pedestrians at night for traffic safety is important, poor lighting on our streets also contributes to personal safety concerns in public spaces and during travel commutes, issues that speak to the unique experience of Black pedestrians in Portland.

The PedPDX safety analysis also shows that street lighting conditions significantly impact the rate and severity of pedestrian crashes in Portland. The PedPDX Safety Analysis found that in Portland crashes involving people walking are more frequent in the fall and winter months when hours of daylight are reduced. Visibility is an important issue for pedestrian safety in Portland, where there is a big swing in the number of daylight hours depending on the time of year. Increasing the amount of lighting at pedestrian crossings is therefore critical for preventing future pedestrian crashes. The Oregon Department of Transportation's Crash Reduction

Factor Appendix cites a 42% crash reduction factor when intersection illumination is provided.

In response, PBOT Signals and Street Lighting staff has updated the City's street lighting level guidelines to ensure better lighting conditions are provided for people walking throughout the city, be it on a sidewalk, trail, path, or at a crossing. Historically PBOT's lighting guidelines were focused on the light output within the vehicle portion of the roadway between the curbs. The target values fluctuated by street classification, with higher values required at intersections. PBOT's new lighting level guidelines establish updated lighting criteria for street sections based on a wider variety of inputs, establishes minimum target light levels along sidewalks, and includes



PEDPDX OBJECTIVES ADDRESSED

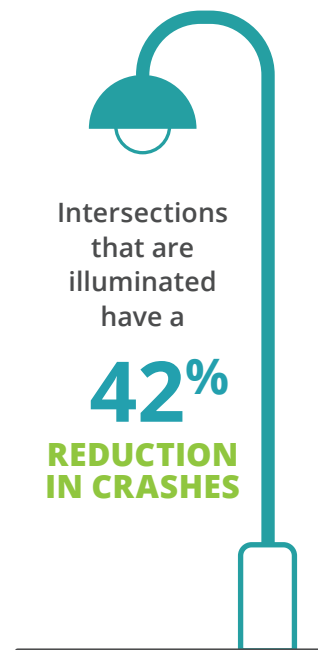


target light levels and expanded analysis requirements for marked pedestrian crossings. The full lighting guidelines can be found in the appendix of this document.

Key pedestrian-related outcomes of PBOT's new lighting level guidelines include:

- Lighting level requirements that are directly tied to PedPDX classifications, with increased lighting levels called for on streets with higher pedestrian demand (for example, Pedestrian Districts and Major City Walkways).
- Guidelines for desired lighting levels for pedestrian facilities, not just for roadway spaces between curbs. This includes establishing minimum lighting levels for the sidewalk corridor behind the curb and for marked crossings and intersections.
- Context-sensitive lighting level guidelines that respond to the alternative pedestrian walkway design types presented in Action 5.1, including pedestrian paths, shared local streets, and shoulder walkways.
- Consideration for where pedestrian-scale lighting (as opposed to higher roadway lighting fixtures) is appropriate.

PBOT project managers will include a lighting analysis and address lighting gaps as part of capital projects. A lighting analysis is included in PBOT's Project Delivery Checklist that project managers use for scoping small and large projects to ensure that these new guidelines are implemented.



Source: Oregon Department of Transportation's Crash Reduction Factor Appendix

PBOT Development Review will also implement new lighting level guidelines as part of private frontage improvements. Lighting level reviews are conducted every time development occurs that constructs new sidewalk and path segments and this practice will continue with updated lighting guidelines.

Considerations

As a new design guideline, changes to lighting conditions concurrent with capital projects and private development will be incremental. Including lighting needs as part of capital project scopes may require an increase to project budgets and/or a phased approach to addressing lighting deficiencies.

Strategy 6

Provide adequate street lighting for pedestrians

ACTION 6.2

PEDPDX OBJECTIVES ADDRESSED



Strategically improve street lighting conditions to increase visibility of (and for) pedestrians on our streets, focusing investment on High Crash Corridors and locations, Pedestrian Priority Streets, and underserved areas.

In addition to implementing new lighting level guidelines through capital projects and private development, PBOT Signals and Street Lighting and Vision Zero staff will evaluate current lighting levels across the city against new guidelines and will identify key crossings for retroactive lighting improvements, where there are not projects planned for the near future.

This analysis and prioritization will focus on high crash corridors, Pedestrian Priority Streets, and historically underserved areas. PBOT Signals and Street Lighting and Vision Zero staff will collaborate to develop a recommended strategic investment plan for addressing lighting gaps to PBOT management.

Considerations

New funding for strategic, citywide lighting level improvements will be required to move this action forward. Any new street lights provided creates future obligations for PBOT and the City, including more assets to maintain, higher energy costs and monthly power bills, and increased staff and equipment expenses for maintenance and relamping.



Street Lighting

ACTION 6.3



Address locations where street lighting is blocked by tree canopy.

Street trees provide many benefits to the community and to the pedestrian experience. However, in some instances large trees can present a safety problem when they block street lighting at night, particularly in Spring and Summer months when leaves return to trees.

Currently residents can report trees blocking street lighting to PBOT, and these street trees will eventually be trimmed by Urban Forestry or PBOT maintenance crews. However, Portland City Code 11.60.060 requires property owners to trim or remove trees on private property or on the adjacent street planting area in the right-of-way when trees branches block street lights, and specifies that private property owners are responsible for costs associated with such maintenance.

PBOT Signals and Street Lighting will coordinate with Urban Forestry to jointly clarify and refine the City's toolkit for addressing street tree and lighting conflicts. Updated practices may include clarifying bureau roles and tree-trimming practices, increasing communication and enforcement of pruning standards, and/or providing pedestrian-scale lighting below the tree canopy where appropriate.

Considerations

Seasonal changes in foliage affect street lighting conditions. The amount of light that reaches the road and sidewalk surface increases during winter months because the leaves from many trees have fallen.

Additional lighting may increase the amount of tree trims needed. Funding for tree-trimming with projected lighting increases should be evaluated.



Large tree canopies can block street lighting at night. This can be particularly problematic in Spring and Summer when leaves return to trees.

PAGE INTENTIONALLY LEFT BLANK.



STRATEGY 7

Manage vehicle speeds and improve driver awareness

Maintaining safe driving speeds, through enforcement and driver education can help to make roadways safer for all. The Walking Priorities Survey found that “people driving too fast on residential streets” and “people driving too fast on busy streets” are two of the top five reasons walking is difficult in Portland. According to the PedPDX Safety Analysis, risk of a pedestrian crash is 180% higher on a street with a 35 mph posted speed than one with 30 mph. The analysis also showed that as the posted speed increases, the risk of a pedestrian crash resulting in death or serious injury also increases. Actions to reduce vehicle speed on roadways with a history of crashes, increase driver awareness and enforce traffic laws will help to implement this Strategy. Measures to address speed through education, enforcement, and outreach supports Portland’s Vision Zero initiative, while working to address concerns about enforcement in communities of color.

Strategy 7

Manage vehicle speeds and improve driver awareness

Table 15: Index of Strategy 7 Actions

ACTION	IMPLEMENTING VS. FUTURE ACTION	CATEGORY	LEADING ROLE
7.1 Set safe speeds on arterials and collectors.	Implementing Action	Infrastructure	PBOT Vision Zero; PBOT Traffic Operations
7.2 Expand automated enforcement activities.	Future Action	Enforcement	PBOT Vision Zero; Portland Police Bureau
7.3 Identify opportunities to retrofit signal timing along the High Crash Network to manage vehicle speeds.	Future Action	Infrastructure	PBOT Signals and Street Lighting; PBOT Vision Zero
7.4 Expand crosswalk enforcement and education activities.	Future Action	Education; Enforcement	PBOT Vision Zero; Portland Police Bureau
7.5 Explore traffic citation policy and structural changes to address inequitable impact of fines and fees on people with lower-incomes.	Future Action	Enforcement	PBOT Vision Zero
7.6 Expand safety education/outreach efforts focusing on people driving.	Future Action	Education	PBOT Vision Zero; Portland Police Bureau
7.7 Establish a program to provide traffic calming on neighborhood streets.	Future Action	Funding	PBOT Traffic Operations

PAGE INTENTIONALLY LEFT BLANK.

Strategy 7

Manage vehicle speeds and improve driver awareness

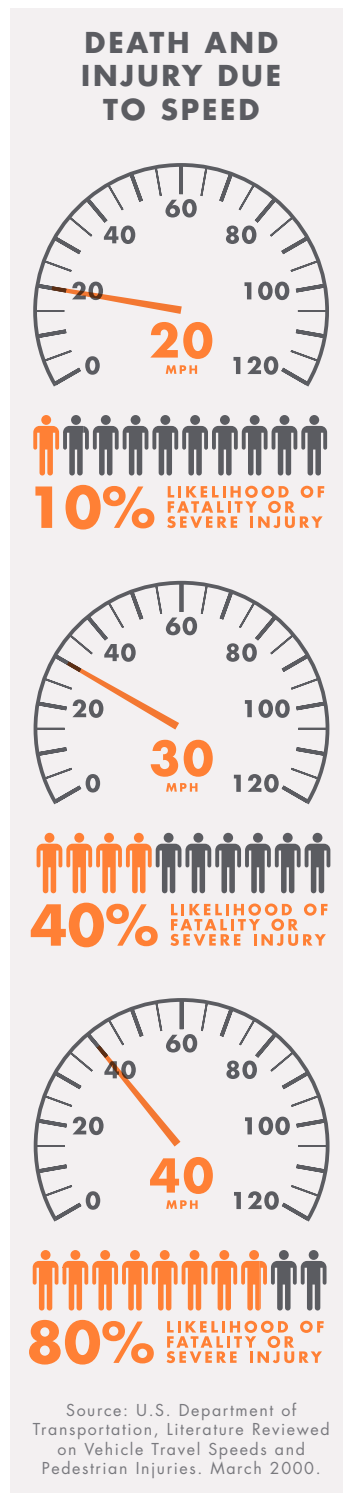
ACTION 7.1

Set safe speeds on arterials and collectors.

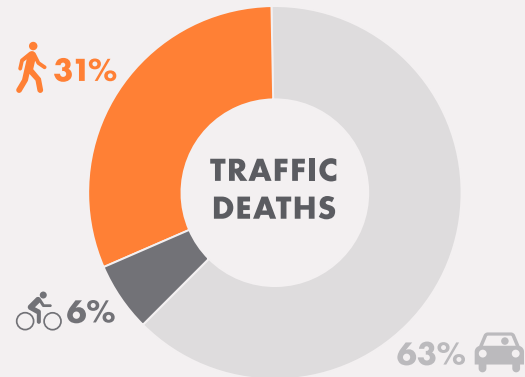
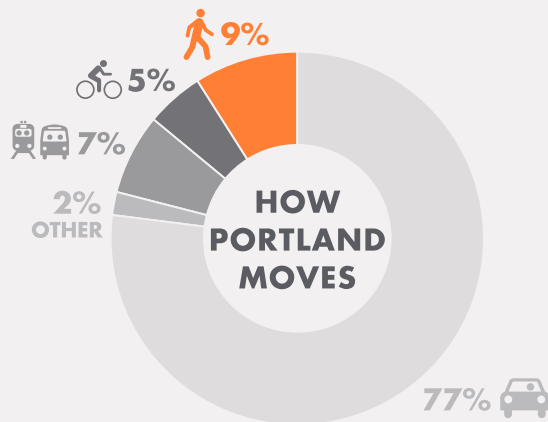
Portland's Vision Zero Action Plan identifies vehicle speed as a major factor in traffic deaths on our streets. Speed impacts the severity of a crash. A person walking struck by a person driving 40 mph is 8 times more likely to die than one struck by a person driving at 20 mph. People walking make up a disproportionate number of traffic deaths. While about 10% of people identify walking as their primary way to travel in Portland, pedestrians make up nearly one-third of all traffic-related deaths. Slowing vehicle speeds is critical to creating a safer city for walking.

PBOT's Vision Zero program actively pursues posted speed reductions in Portland. However, the City of Portland does not control posted speed limits on City streets. Currently in Oregon, the State sets speed limits on city streets, and cities must send a request to the Oregon Department of Transportation (ODOT) if they desire to change a speed limit. PBOT aggressively submits requests to ODOT for posted speed limit reductions in Portland in an effort to decrease speed-related traffic deaths on our streets, and will continue to do so.

In 2017, the state legislature granted Portland authority to drop residential speed limits from 25 mph to 20 mph. These new speed limits took effect on April 1, 2018 and new sign installation began in February of 2018. PBOT and City staff are currently working at the State level to gain local authority for setting speeds on City of Portland streets, including high-speed arterial and collector streets.



PEDPDX OBJECTIVES ADDRESSED



PORTLAND TRAFFIC DEATHS VS. TRAVEL MODE

Source: 2004–2013 ODOT crash data; 2015 City of Portland Community Survey

Considerations

There are four methods by which ODOT sets speed limits on City streets:

- 1) Traditional – This method is required on arterial streets, except on sections eligible for business district statutory speed limits. Requests to change speeds limits are typically time-consuming and resource-intensive, involving analysis of 85th percentile speeds, crash history, “roadside culture,” traffic volumes, roadway alignment, width, and surface. These requests, when accepted, result in an updated speed zone order held by the state.
- 2) Alternative – This method was implemented in 2016 so that PBOT could submit requests more easily and applies to non-arterial streets with speed limits above 25mph. This method includes the following speed limit guidelines: 20 mph maximum on shared space streets, a 20-30mph maximum on streets with busy intersections and crash history, where sidewalks are unbuffered from driving lanes, or where bike lanes are immediately adjacent to driving lanes, and a 20-40 mph maximum on streets without a median barrier or where there is no physical separation between people traveling in motor vehicles and

people traveling outside motor vehicles. These requests result in an updated speed zone order held by the state.

- 3) Statutory – These requests apply to alleys, narrow streets, school zones, residence districts, and business districts. Requests to rescind speed zone orders and lower speed limits in these areas are relatively simple and can be implemented quickly.

- 4) Special clauses – This method applies on low-traffic neighborhood greenways and certain residential streets and allows for 5 mph below statutory speed limits.

ORS 811.111 describes statutory (specified by law) speed limits for streets in particular areas, like in a business district, near schools and parks, and on especially narrow roadways. There are many streets in Portland that have speed limits that are different than the statutory speeds because they have speed zone orders. A speed zone order sets a speed limit (sometimes called a “designated” or “non-statutory” speed limit) that supersedes a statutory speed limit and is created by ODOT upon request by a local road authority. PBOT must request that a speed zone order be rescinded in order for a statutory speed limit to take effect on an eligible street.

Strategy 7

Manage vehicle speeds and improve driver awareness

ACTION 7.2

PEDPDX OBJECTIVES ADDRESSED



Expand automated enforcement activities.

Speed safety cameras are a proven safety tool for reducing dangerous speeding in neighborhoods. Prior to 2015, state law only allowed the operation of photo radar systems in mobile vans for no more than four hours in one location with a uniformed police officer present. This resulted in inconsistent enforcement and a “decay effect” – travelers return to speeding once the van leaves. The newer fixed speed safety camera system provides more consistent and predictable speed control on Portland’s most dangerous streets. PBOT has installed speed safety cameras on four of its High Crash Network streets -- SW Beaverton-Hillsdale Highway, SE Division Street, SE 122nd Avenue and NE Marine Drive -- as a part of a pilot program.

When people drive past the cameras while exceeding the posted speed limit, the cameras capture photos and video for review by Portland Police. The state law authorizing Portland to operate fixed speed safety cameras outlines signage requirements that inform drivers that traffic laws are photo enforced and provide supplemental feedback of a driver’s current rate of speed. The number of speeders and those driving in excess of 10 mph over the speed limit has dropped compared to the “before” speed counts conducted near the camera systems. The number of violations mailed dropped following the initial 30-day warning period. More detailed information about the fixed speed safety camera systems can be found in the biennial report to the state legislature.

PBOT will expand its automated enforcement program in support of Vision Zero actions. Program expansion will consider the use of dual camera systems: photo enforcement of speed at red light running enforced intersections. HB 2409 authorizes any city to use cameras at signalized intersections to enforce red light running or speeding without the presence of a police officer.



Automated Speed Safety System

For over two decades, the City has been a leader in utilizing automated enforcement tools to bolster transportation safety. Operationalized in 2016, fixed photo enforcement of speed is the City’s newest tool in the enforcement toolkit. Reducing speeding and reducing the number of people speeding aims to drive down the risk that speeding exposes all road users – especially those walking or cycling. Any revenue beyond the program costs will be dedicated to investing in traffic safety among the City’s High Crash Network corridors. While several years remain to draw additional observations from a 5-year period of crash data, the nascent program’s near-term positive results demonstrate that the program can support the goal of zero deaths and serious injuries on Portland’s high crash network streets. PedPDX supports expansion and continuation of this program to reduce speeds and make walking safer on Portland’s most dangerous roadways.

Considerations

Expanding automated enforcement in Portland not only relies on crash data analysis or speed studies but also the staff and systems outside of PBOT: Portland Police Bureau, the Multnomah County Circuit Court (4th Judicial District, Oregon State Courts) and Department of Motor Vehicles (DMV).

ACTION 7.3



Identify opportunities to retrofit signal timing along the High Crash Network to manage vehicle speeds.

Traffic engineers can set the progression of signals as they shift from red to green along a given corridor to help manage traffic flow for efficient movement of vehicles, bikes, and pedestrians. Signal timing can also be used to establish safe vehicle speeds. In Downtown Portland for example, traffic signals are timed such that if a person in a car or bike (or a very talented runner!) traveled at roughly 13-16 mph, they would be met with green light after green light. If someone were to try to travel any faster, they would be stopped at each intersection along the corridor by a red light.

Portland's High Crash Network includes many arterial roadways with very high-speed limits and often even higher average vehicle speeds. One tool that PBOT can use to manage those speeds is to set signal timing to discourage people driving faster than the set speed limit. When coordinated signal timing is in place, people driving faster than the speed limit will be faced with red lights at every intersection, while people traveling at or below the speed limit will be met with green lights.

PBOT Signals and Streetlighting will conduct an analysis of signal timing on the High Crash Network to identify opportunities to lower vehicle speeds through signal timing modifications. As new posted speed limits are implemented, PBOT Signals and Streetlighting will adjust signal timing as appropriate to manage vehicle speeds.

Considerations

Funding will be required to modify traffic signals on the High Crash Network.

Changing the signal timing at one location could lead to a ripple impact to dozens of nearby signals.

Successful implementation of countermeasures for speed management may include adding new detection or upgrading signal controllers at existing signals.



Signal Timed Lights

Strategy 7

Manage vehicle speeds and improve driver awareness

ACTION 7.4



Expand crosswalk enforcement and education activities.

PBOT coordinates with Portland Police Bureau (PPB) Traffic Division and local pedestrian and bicycle groups to conduct “crosswalk education and enforcement actions” throughout the city. Each crosswalk education and enforcement action is an opportunity to educate community members about Oregon crosswalk laws and to enforce the law. During each crosswalk education and enforcement action, PPB officers can give violators an option to take a 2-hour Share the Road Safety Class. Once the Share the Road Safety Class is successfully completed, the fine and violation are removed from the individual’s record.

Each crosswalk education and enforcement action includes a pedestrian decoy strategically positioned at a location that has marked or unmarked crosswalks and a fair amount of pedestrian activity and vehicle travel. Drivers that fail to stop for pedestrians in the crosswalk according to Oregon law can be issued a warning or given a citation that carries a presumptive fine of \$260. Crosswalk enforcement actions are conducted several times across the city throughout the year.

Nominations for possible crosswalk education and enforcement action sites are submitted by community members, Portland Police Bureau (PPB) officers, PBOT engineers, and other PBOT staff. Most of the locations selected for a crosswalk education and enforcement action are on the Vision Zero High crash network.

Based on recent research indicating lower vehicle yielding rates for Black pedestrians attempting to cross the street, as well as feedback from the PedPDX “Walking



Crosswalk

While Black” focus group, PBOT will expand the program to also prioritize crossings that have been identified by communities of color as locations where drivers do not stop for them.

Prior to each crosswalk education and enforcement action, PBOT hand delivers information about the crosswalk education and enforcement action and information about Oregon crosswalk laws to businesses within 2-3 blocks of the location, sends out electronic notifications to the neighborhood association where the action will take place and members of the media, and posts information about the event on PBOT’s webpage.

Since 2005, PBOT and PPB have conducted over 100 crosswalk education and enforcement actions.

Considerations

Crosswalk education and enforcement actions are reliant on Portland Police Bureau staffing availability.

ACTION 7.5

Explore traffic citation policy and structural changes to address inequitable impacts of fines and fees on people with lower-incomes.

Traffic citations can sometimes have a regressive impact. While a flat fine or fee for a traffic violation may not substantially impact a middle- or high-income person, the same fine can sometimes significantly impact a low-income person.

As such, PBOT's Vision Zero team will explore systematic changes to move toward a more just citation system to ensure that consequences for traffic violations do not place an inequitable burden on lower-income people in Portland.

Some jurisdictions employ a sped camera fine system, which treats speed camera citations like parking tickets. A speed camera fine system can result in a lower fee and allow fine structures to be controlled directly by the City. This would allow the City to pursue ability to pay or income-based structures without needing to obtain authorization from the State legislature.

Considerations

A new income-based citation or speed camera fine system would require State legislative action. A well-functioning ability to pay system will cost some money and may reduce revenue from citations.

Strategy 7

Manage vehicle speeds and improve driver awareness

ACTION 7.6

PEDPDX OBJECTIVES ADDRESSED



Expand safety education/outreach efforts focusing on people driving.

Ninety-one percent of all fatal and serious traffic injuries in Portland involve speeding, impaired driving, and other dangerous driving behaviors. Educating community members about Oregon crosswalk laws, the relationship between speed and fatality rates, the impact of behaviors on vulnerable populations including seniors, children, and the disabled, Oregon distracted driving laws, and safety tips for being a safer driver can lead to safer streets for all.

PBOT currently engages in several efforts to help educate drivers:

- PBOT Vision Zero education campaigns include 1) The “Safe Ride Home” campaign to prevent impaired driving by offering reduced-cost rides home on targeted holidays with the goal of preventing drivers from driving under the influence, 2) The “Struck” campaign will continue with various iterations focusing on improving driver behaviors.
- PBOT educational programs include: 1) Scheduled in-classroom and “Walk & Talk” trainings that include an in-classroom training followed by a walk and discussion outside; trainings are available city-wide for all community members with a priority focus of promoting the trainings to community members located on or near Vision Zero high crash network streets and community members with limited English proficiency skills, 2) Viewing of PBOT educational online videos including Every Corner is a Crosswalk, Oregon Walks – Be Safe, and Beacon Buddies, 3) Promoting The Street Trust’s

91%

of all fatal and serious traffic injuries in Portland involve

✓ **SPEEDING**
✓ **IMPAIRED DRIVING**
✓ **OTHER DANGEROUS DRIVING BEHAVIORS**

“Oregon Friendly Driver” program and other traffic safety classes on the PBOT Traffic Safety Resources webpage.

- PBOT’s Yard Sign Lender Program has free and \$25 signs that community members can use (or keep) to display on their personal property. Each sign displays “SLOW DOWN” on one side and has one of three messages on the reverse side – “WATCH for people biking” or “STOP for people crossing” or “LOOK for kids and seniors.”
- PPB driver safety classes for immigrant and refugee adults include in-classroom trainings and behind-the-wheel driver experiences. Each participant will receive training about Oregon traffic laws including Oregon crosswalk laws and how to be safer when walking and driving.

- Partnering with Families for Safe Streets to implement a World Day of Remembrance event each year to remember those that were killed or seriously injured in traffic crashes and to thank first responders to traffic crashes.

Portland Vision Zero staff will coordinate with Portland Police Bureau to substantially expand efforts to educate drivers to message the importance of safe driving speeds and spread awareness of Oregon law. This could include (but is not limited to) broad reaching media campaigns, expanding PBOT's SmartTrips education program beyond people who have just moved, required training for commercial drivers and private-for—hire drivers, working with PBOT Communications staff to reach broader audiences including non-native English speakers and vulnerable residents, and leveraging community partnerships.

Considerations

Significantly expanding outreach and education efforts will require additional funding.



SLOW! Signage

Strategy 7

Manage vehicle speeds and improve driver awareness

ACTION 7.7

PEDPDX OBJECTIVES ADDRESSED



Establish a program to provide traffic calming on neighborhood streets.

Traffic calming measures such as speed bumps slow down vehicle speeds, making neighborhoods safer for walking and biking. Speed bumps in particular can be relatively inexpensive, and provide a big impact on vehicle speeds for a relatively small investment. While speed bumps and speed cushions are not allowed on major arterials or higher-volume collector streets, they can be used effectively on some neighborhood collectors and local streets to reduce vehicle speed.

In past years, PBOT had a Traffic Calming Program in place by which residents could request installation of speed bumps on neighborhood streets, as determined by an engineering analysis of vehicle speeds and volumes. However funding was cut for the program and was never reinstated. Given the impact of vehicle speed on pedestrian and bicycle crash severity and the relatively low-cost of speed bumps to help reduce speeds, there has been significant interest in reviving PBOT's Traffic Calming Program.

A new PBOT Traffic Calming Program would work in tandem with Action 11.4 which seeks to identify processes by which residents and neighborhoods not prioritized for City investment may self-fund improvements, including speed bumps. While many neighborhoods in Portland may be able to fundraise or collectively self-fund desired improvements such as speed bumps, less affluent neighborhoods may not. New self funding mechanisms for resident-requested traffic calming will require addressing these potential equity concerns.



Speed bumps in Portland

PBOT's Traffic Operations group and supporting staff will explore the feasibility of establishing a new traffic calming program to provide speed bumps and other traffic calming features on local service streets and some potential neighborhood collector streets where warranted by vehicle speeds and volumes.

Traffic calming should be prioritized on local and collector-level streets within the Pedestrian Priority Network, including designated Safe Routes to School, Neighborhood Greenways, other Neighborhood Walkways, and collector-level City Walkways.

Considerations

Establishing a new PBOT program to respond to resident requests for traffic calming is predicated on obtaining new funding for staff time and program management.

If a request-based program is not feasible or not funded, traffic calming on local and collector streets may be integrated into existing pedestrian programs, such as Safe Routes to School and Pedestrian Network Completion. To ensure that improvements provided by these City programs are delivered equitably across the City, traffic calming improvements should be programmatically evaluated and prioritized based on vehicle speed and volume data.

Speed cushions may be provided on Secondary Response Routes. Speed cushions on Major Response Routes require Fire Bureau approval. TSP policy discourages the use of speed bumps or cushions on Major Transit Priority Streets.

PAGE INTENTIONALLY LEFT BLANK.



STRATEGY 8

Construct and maintain obstruction-free sidewalks

Buckled, cracked or uplifted sidewalks were reported to be one of the top pedestrian difficulties citywide in the Walking Priorities Survey. Participants in the Disability Focus Group also cited sidewalks that do not meet Americans with Disabilities Act (ADA) standards, construction projects that do not re-route pedestrian pathways, and sidewalks impeded by vegetation, trash or debris. Addressing these obstructions and the poor condition of the paving itself would make walking enjoyable for all ages and abilities. Programs, practices, and coordination with other departments can help to address obstructions in a timely manner and maintain obstruction-free sidewalks.

An update to the City's sidewalk repair program could include proactive sidewalk inspection and could include strategies to identify financing options to help low-income households and other property owners address sidewalk repair. This strategy is particularly important for people with disabilities, as was heard in the Disability Focus Group.

Strategy 8

Construct and maintain obstruction-free sidewalks

Table 16: Index of Strategy 8 Actions

ACTION	IMPLEMENTING VS. FUTURE ACTION	CATEGORY	LEADING ROLE
8.1 Identify financing strategies and cost-saving opportunities to help low-income households and other property owners address sidewalk repair.	Future Action	Policy; Maintenance; Funding	Commissioner's Office; PBOT Utilities, Construction, and Inspection
8.2 Address sidewalk repair needs along City-owned properties.	Future Action	Maintenance; Funding	PBOT Utilities, Construction, and Inspection
8.3 Explore a proactive sidewalk inspection program.	Future Action	Policy; Maintenance	PBOT Utilities, Construction, and Inspection
8.4 Update coordination practices with Urban Forestry when trees are uplifting sidewalks and develop joint practices for addressing tree/sidewalk conflicts.	Future Action	Maintenance	PBOT Utilities, Construction, and Inspection
8.5 Expand property owner education regarding responsibility for maintaining sidewalks.	Future Action	Education	PBOT Utilities, Construction, and Inspection; PBOT Communications
8.6 Update right-of-way design standards to provide sufficient room for trees.	Future Action	Policy	Streets 2035 Project Manager; Urban Forestry; PBOT Modal Coordinators
8.7 Address utility poles creating obstructions in through zone of the sidewalk.	Future Action	Infrastructure	PBOT Capital Delivery Division; PBOT Utilities, Construction, and Inspection
8.8 Update clear zone requirements for outdoor dining and A-board signage based on new PedPDX pedestrian classifications.	Future Action	Policy	BDS Enforcement (A-board signs); PBOT Portland in the Streets (sidewalk cafes)

ACTION	IMPLEMENTING VS. FUTURE ACTION	CATEGORY	LEADING ROLE
8.9 Locate utility vaults outside of pedestrian clear zones.	Implementing Action	Policy	PBOT Utility Permitting
8.10 Coordinate with street cleaners to help ensure that pedestrian facilities including curb ramps and crossings are debris-free.	Future Action	Maintenance	PBOT Maintenance; PBOT ADA Coordinator;
8.11 Improve enforcement and implementation of pedestrian access requirements around work zones, and establish a system for notifying residents of construction-related changes to pedestrian access.	Future Action	Policy	City Traffic Engineer; PBOT Utilities, Construction, and Inspection
8.12 Educate about parking violations at driveways and crossings.	Future Action	Education	PBOT ADA Coordinator
8.13 Work with the disability community to develop trip planning assistance.	Future Action	Education	PBOT ADA Coordinator
8.14 Develop a public reporting system and a process for addressing drainage issues at curb ramps with pooling water.	Future Action	Education	PBOT ADA Coordinator; PBOT Maintenance

Strategy 8

Construct and maintain obstruction-free sidewalks

ACTION 8.1

Identify financing strategies and cost-saving opportunities to help low-income households and other property owners address sidewalk repair.

Maintaining sidewalks is critical to providing accessible walkways and preventing potentially dangerous tripping hazards, particularly for those with mobility challenges or sight impairments. Participants at the PedPDX Disability Workshop cited cracked and buckled sidewalks as a particular barrier to accessibility and mobility in Portland. While most pedestrians are able to maneuver around and avoid cracked sidewalks, pedestrians in wheelchairs often cannot. What's worse, wheelchairs and other mobility devices can be tipped and overturned by buckled sidewalks. Cracked and buckled sidewalks create tripping hazards for all people, particularly in dark conditions.

Per City Charter and City Code, property owners are responsible for constructing, maintaining, and repairing the sidewalks abutting their property. This obligation includes repairing sidewalks that are uplifted or cracked due to tree roots, the most common cause of sidewalk damage.

PBOT's Sidewalk Repair program investigates reports of cracked and buckled sidewalks as submitted by residents. When a City sidewalk inspector finds a safety hazard attributable to cracked or broken sidewalks, the owner of the adjacent property is notified and is required to repair the sidewalk. Historically, this authority has been referred to as "posting," because a notice requiring the repair of the sidewalk is posted on the property. According to City code, property owners have 60 days to complete repairs. If they don't, the City can hire a contractor to complete the repairs and bill the property owner. If they don't pay the bill, a lien will be placed on their property.



The **average cost of sidewalk repair for a full sidewalk frontage** currently ranges from

\$900-\$1,200



Safe, Accessible Sidewalk

PEDPDX OBJECTIVES ADDRESSED



The average cost of sidewalk repair for a full sidewalk frontage currently ranges from \$900-\$1,200. This cost can be a burden to low-income and other property owners.

To help ensure that Portland sidewalks are safe and accessible, particularly for vulnerable pedestrians, and to ease the financial burden on property owners, PBOT Utilities, Construction, and Inspection (who now oversees PBOT Sidewalk Repair) will coordinate with the Commissioner's Office to identify and initiate financing and cost-reduction strategies to help low-income households and other homeowners address sidewalk repair obligations. Such strategies could include (but are not limited to):

- Waiving all permit fees for voluntary sidewalk repair (currently permit fees are reduced for voluntary sidewalk repair)

- Requiring sidewalk repair when properties are sold as a condition of sale
- Establishing a revolving "micro-loan" fund, with options for deferred payment when properties change hands
- Developing voluntary, "opt-in," neighborhood-scale sidewalk repair efforts, allowing PBOT crews to help property owners address sidewalk maintenance. Batching sidewalk repairs across a neighborhood creates an economy of scale and potential cost savings over addressing sidewalk repair needs property by property. Property owners could voluntarily opt-in (in a manner similar to PBOT's former opt-in Leaf Day fee) to save money on required sidewalk repair obligations.
- Subsidizing City labor to provide sidewalk repair work for property owners

Considerations

Any new City-funded financing structures would require a property lien and a funding source. Additional labor by City maintenance crews would also need a funding source.

Strategy 8

Construct and maintain obstruction-free sidewalks

ACTION 8.2

PEDPDX OBJECTIVES ADDRESSED



Address sidewalk repair needs along City-owned properties.

The obligation to repair buckled and cracked sidewalks adjacent applies to all property owners, including home owners, business owners, school, other large institutions, and City and government property owners. Like all property owners, the City of Portland must maintain sidewalks along frontages of City-owned property.

PBOT Utilities, Construction, and Inspection oversees PBOT's Sidewalk Repair Program, and will conduct an assessment of sidewalk conditions along all City-owned properties. Repair of all buckled and cracked sidewalks will subsequently be the responsibility of the respective City bureau owning the property.

Considerations

(NOTE: NO CONSIDERATION CONTENT)



Sidewalk Needs Repair

ACTION 8.3

PEDPDX OBJECTIVES ADDRESSED



Explore a proactive sidewalk inspection program.

PBOT's Sidewalk Repair Program notifies private property owners when cracked or damaged sidewalks along their property frontage must be repaired. The program relies on Portland residents to notify PBOT when sidewalks are damaged. As staffing allows, sidewalk repair staff occasionally do some proactive inspections around newly installed ADA corners and paving segments done by Maintenance Operations crews.

A complaint-driven program presents equity concerns. The majority of complaints to the City tend to come from higher-income, inner Portland neighborhoods. Consequently, pedestrian conditions in outer neighborhoods (where a large proportion of disabled residents live) are less frequently addressed than in inner neighborhoods. A complaint-driven program also does not ensure that high-priority pedestrian streets are safe and well-maintained.

Upon establishing financing and cost-reduction strategies in Action 8.1 and addressing sidewalk repair needs along City-owned properties, PBOT Utilities, Construction, and Inspection will explore the feasibility of establishing a proactive, rather than complaint-driven, sidewalk repair program. A proactive sidewalk inspection program should prioritize locations with high levels of pedestrian activity, including Pedestrian Districts and Major City Walkways.

Considerations

Any new proactive sidewalk inspection program must be coupled with financing and cost-saving strategies, as articulated in Action 8.1.



Sidewalk Needs Repair

Strategy 8

Construct and maintain obstruction-free sidewalks

ACTION 8.4

PEDPDX OBJECTIVES ADDRESSED



Update coordination practices with Urban Forestry when trees are uplifting sidewalks and develop joint practices for addressing tree/sidewalk conflicts.

Tree roots are the most common cause for uplifted and damaged sidewalks. When trees are oversized for the planting area or do not have sufficient space for roots, the tree can uplift and crack sidewalks, streets, and curbs. Cracked and buckled sidewalks present a significant accessibility concern for pedestrians with disabilities, and potentially dangerous tripping hazards for all.

Portland City Charter and City code stipulate that property owners are responsible for maintaining and repairing sidewalks abutting their property. This obligation includes repairing sidewalks damaged by tree roots. Repairing cracked sidewalks without simultaneously addressing the core cause of the problem can result in a mere temporary fix, whereby the property owner will be responsible for repairing the sidewalk again in the future as tree roots continue to damage sidewalks.

The PBOT Sidewalk Repair Program will collaborate with Urban Forestry to develop joint practices for addressing tree and sidewalk conflicts to result in good solutions that prevent recurrent costly repairs for property owners. This should include a process for joint evaluation by PBOT and Urban Forestry staff when tree/sidewalk conflicts arise, and developing a joint solutions “toolkit” for addressing tree/sidewalk conflicts, potentially including but not limited to root pruning, expanding tree planting zones into on-street parking zones, expanding the right-of-way to relocate the sidewalk, grinding or raising sidewalks, and tree removal as needed.

Considerations

Some potential joint solutions may include expanding the right-of-way or impacting on-street parking. As such the City Engineer and PBOT Parking may participate in developing new joint practices.



Tree Sidewalk Conflict

ACTION 8.5



Expand property owner education regarding responsibility for maintaining sidewalks.

Maintaining sidewalks is critical to providing accessible walkways, particularly for those with mobility challenges or sight impairments. While most pedestrians can maneuver around obstacles, pedestrians with visual impairments and those using wheelchairs and mobility devices often cannot avoid cracked sidewalks, pathways blocked by overgrown vegetation, garbage and recycling bins in the sidewalk, or impassable sidewalks due to snow, ice, or leaves. Participants in the PedPDX Disability Workshop cited blocked and poorly maintained sidewalks as a particular barrier to accessibility and mobility in Portland.

While private property owners are responsible for maintaining sidewalks, many Portlanders do not know this, nor are many aware of the impact that poorly maintained sidewalks have on disabled pedestrians and our fellow Portlanders.

PBOT Communications currently distributes seasonal reminders via social media, email, and print regarding the need to clear snow and ice and remove leaf litter from storm drains and sidewalks. PBOT Communications and PBOT Utilities, Construction, and Inspection will continue to expand communications and materials educating property owners about sidewalk maintenance responsibilities. Expanded education efforts may include coordination with neighborhood and business associations, leveraging PBOT's SmartTrips mailings, and expanded social media efforts.

Considerations

Education and outreach efforts need to reach non-English speaking residents. Such efforts may include partnerships with chambers of commerce and minority-owned media outlets.



Sidewalk Obstacles

Strategy 8

Construct and maintain obstruction-free sidewalks

ACTION 8.6

PEDPDX OBJECTIVES ADDRESSED



Update right-of-way design standards to provide sufficient room for trees.

In addition to their many environmental benefits, Portland's urban forest contributes to a more comfortable and pleasant walking and rolling experience. Trees provide shade and a physical buffer from traffic and noise and contribute to Portland's quality of place.

Given the mobility, accessibility, environmental, and place-making demands on PBOT's streets and limited space to accommodate all of these needs, tradeoffs about how to design and allocate space within rights-of-way must be made. PBOT's Streets 2035 effort will establish decision-making frameworks for various street types to help clarify priorities when various demands on the right-of-way compete for space, including pedestrian and bicycle facilities, transit needs, vehicular mobility, on-street parking, stormwater infrastructure, and street trees.

Given limited space in the right-of-way, this may include increasing the size of the furnishing zone, providing trees within the curb zone intermittent with on-street parking, providing soil cells and/or continuous planting strips (rather than tree pits) to allow roots space to grow without disturbing infrastructure above.

Considerations

Urban Forestry will work closely with the Streets 2035 project manager in clarifying right-of-way needs and tradeoffs regarding street trees, including reconciling against competing needs in the right-of-way. The location of underground utilities may impact the feasibility of locating street trees within on-street parking zones.



Providing street trees within the curb zone intermittent with on-street parking can help maximize space within narrow rights-of-way

ACTION 8.7



Address utility poles creating obstructions in the through zone of the sidewalk.

The Portland Pedestrian Design Guide establishes that the through pedestrian zone, the area of the sidewalk intended for pedestrian travel, “be entirely free of permanent and temporary objects.” In contrast, the furnishing zone of the sidewalk is the area where elements such as street trees, signal poles, utility poles, street lights, controller boxes, hydrants, signs, hatch covers, etc. are properly located. The furnishing zone is therefore a critical component of the sidewalk as it helps ensure that walkways are clear of obstructions.

Oftentimes if a furnishing zone is not provided sidewalks are too narrow to fit signal poles and boxes, push button poles, utility poles, and other items that need to be in a sidewalk corridor. This can result in utility poles obstructing the required pedestrian through zone, sometimes not leaving enough room for a person using a mobility device to get through or creating an obstacle for people with low or no vision.

Franchise agreements with utility providers permit the City to require that utility poles be located in accordance with City right-of-way guidelines, with the cost for relocation of poles borne by utility providers. As such, as new sidewalk projects are delivered project managers in the PBOT Capital Delivery Division will require utility providers to relocate utility poles located within the pedestrian through zone. This may include requiring that utility poles be relocated to a suitable alternative location on public or private property, and/or altering the design of the sidewalk to provide a furnishing zone when feasible. Additionally, the PBOT Pedestrian Coordinator will

evaluate opportunities to relocate utility poles resulting in substandard sidewalk widths outside of capital projects, and will work with PBOT’s Utility group to require the relocation of poles creating obstructions.

Considerations

If there is not a suitable above ground location for utility poles, providers may choose to locate utility infrastructure below ground. City Code 17.60 establishes six Underground Wiring Districts where overhead wires are not permitted. While locating utility infrastructure below ground remains an option for utility providers, establishing new required underground wiring districts will require the City to bear the cost of relocating utility infrastructure.



Utility Pole Obstructing Sidewalk

Strategy 8

Construct and maintain obstruction-free sidewalks

ACTION 8.8



Update through zone requirements for outdoor dining and A-board signage based on new PedPDX pedestrian classifications.

Outdoor dining is part of Portland’s culture, social identity, and local economy. PBOT issues permits to applicants seeking to provide outdoor dining within the sidewalk. Permit requirements stipulate that outdoor café seating must maintain minimum pedestrian clear zones, depending on the overall width of the sidewalk. Maintaining adequate pedestrian through zones is important for ensuring that sidewalk mobility is not impacted in busy pedestrian districts or corridors where demand for walking space is high. It is also important for pedestrians in wheelchairs or mobility devices who cannot always maneuver in tight spaces.

Once pedestrian design guidelines are updated based on PedPDX, PBOT Street Use Permitting will review current requirements and determine whether clear zone requirements for café seating permits should be revised to reflect new design guidelines and PedPDX classifications. Future materials for applicants will include educational information explaining the importance of maintaining pedestrian clear zones, particularly for disabled pedestrians.



Sidewalk Cafe with Tight Passage

Considerations

A-board signs are permitted and enforced by the Bureau of Development Services (BDS). PBOT will coordinate with BDS to ensure that A-Board signs maintain pedestrian clear zones.

PDX Reporter allows Portlanders to report problems and maintenance issues to City bureaus, including instances of non-compliant sidewalk cafes. PDX Reporter is available in app format as well as via web app at www.pdxreporter.org.

PAGE INTENTIONALLY LEFT BLANK.

Strategy 8

Construct and maintain obstruction-free sidewalks

ACTION 8.9

Locate utility vaults outside of pedestrian clear zones.

The 1998 Pedestrian Master Plan defines the through pedestrian zone as “the linear portion of the sidewalk corridor which contains no obstructions, openings, or other impediments that would prevent or discourage movement by pedestrians.” The Portland Pedestrian Design Guide stipulates that this zone “should be entirely free of permanent and temporary objects,” and that utility vaults should be located in the furnishing zone and are not permitted in the through pedestrian zone. The Pedestrian Design Guide further notes that if utility vaults do not fit within the furnishing zone, they should be located on private property.

Additionally, Federal ADA guidance stipulates that utility vault lids and meters should not be located within pedestrian movement corridors. The United States Access Board⁵ states that utility meters and vaults should be located outside the pedestrian accessible corridor and should be placed in furniture or frontage zones on all sidewalks when there is at least twelve feet between curb and back of right-of-way⁶.

As the scale of development has increased in Portland, utility vaults serving new buildings have increased in size, and have been pushed from private buildings into the right-of-way. In an increasing number of instances these utility vaults are too large to be fully accommodated within the furnishing zone of the sidewalk, and despite existing local policy and federal guidance, have in many instances intruded into pedestrian clear zones.

In response to pressures from utility providers and the development community, PBOT practice has been to



People walking tend to veer around metal vault lids in the sidewalk even when they are treated with “slip resistant” coating, effectively narrowing sidewalk capacity and obstructing the pedestrian through zone.

PEDPDX OBJECTIVES ADDRESSED



permit vaults in the pedestrian clear zone provided that vault lids are “slip resistant.” However, the U.S. Access Board does not provide a minimum level of slip resistance (expressed as a coefficient of friction) for ground surfaces for ADA compliance “because a consensus method for rating slip resistance remains elusive. While different measurement devices and protocols have been developed over the years for use in the laboratory or the field, a widely accepted method has not emerged.” Not only is the definition and measurement of “slip resistance” ill-defined, but the inability to visually perceive “slip resistance” results in an effective narrowing of the sidewalk when utility vaults are located within the pedestrian clear zone. People walking or rolling on sidewalks tend to veer around vault lids rather than walk across them and are typically not able to know by looking whether the metal lid in the sidewalk ahead is slip coated or not or will rattle or settle when stepped upon.

When vaults must be located within the pedestrian clear zone, vault lids should be concrete “lift out” panels or otherwise matching the material of the surrounding sidewalk. Metal lids should not be provided within the pedestrian clear zone on high-demand pedestrian streets.

Considerations

Providing concrete panels or otherwise matching sidewalk materials within vault lids is common practice throughout the world. Requiring concrete lift out panels on vaults rather than metal lids will increase costs for utility providers and developers. Limiting the extent of this requirement to the highest-order pedestrian streets and districts per PedPDX (Pedestrian Districts and Major City Walkways) helps to limit financial impact while maintaining sidewalk function and capacity on streets with the highest levels of pedestrian activity. Cranes may be required to lift out concrete panels to maintain transformers.



A concrete vault lid in the pedestrian through zone, matching the material of the surrounding sidewalk

⁵ The United States Access Board is the federal agency responsible for developing accessibility guidelines for public rights-of-way consistent with the Americans with Disabilities Act.

⁶ US Access Board Special Report, “Accessible Public Rights-of-Way Planning and Design for Alterations,” Chapter 5 Model Sidewalks. August 2007.

Strategy 8

Construct and maintain obstruction-free sidewalks

ACTION 8.10

PEDPDX OBJECTIVES ADDRESSED



Coordinate with street cleaners to help ensure that pedestrian facilities including curb ramps and crossings are debris-free.

Debris in the roadway at corners and crosswalks interferes with pedestrian accessibility, whether it be leaves, mud, gravel, ice, or snow. Participants at the PedPDX Disability Workshop highlighted that for people with limited mobility such as those using walkers or wheelchairs, mud, leaves, and other debris at corners can create a real obstruction and impede their ability to cross the street.

The PBOT ADA Coordinator and Pedestrian Coordinator will coordinate with PBOT Maintenance to help ensure that pedestrian the City's street cleaning and maintenance activities extend to and include corners, curb ramps, and crossings.

Considerations

Expanded street cleaning activity to include corners and ramps must be coupled with new funding.



Crosswalk and Curb Ramp

PAGE INTENTIONALLY LEFT BLANK.

Strategy 8

Construct and maintain obstruction-free sidewalks

ACTION 8.11

Improve enforcement and implementation of pedestrian access requirements around work zones, and establish a system for notifying residents of construction-related changes to pedestrian access.

PBOT Administrative Rule 8.12, adopted in 2016, details guidelines for providing safe accommodations for pedestrians through work zones. The associated temporary traffic control manual details City standards and expectations for safe pedestrian movement, including providing temporary ADA compliance where required. The policy is supported by a newly created enforcement program. Currently, City policy requires all those impacting the public rights-of-way (ROW) to notify adjacent businesses and residents.

Pedestrians with disabilities are particularly impacted by sidewalk closures. For a person with low or no vision or a person using a wheelchair or mobility device an unforeseen sidewalk closure on a frequently used route could leave them in a dangerous situation navigating in and around a construction site. Therefore, closure of a sidewalk shall be deemed the last resort in the absence of other practicable routing or accommodation options needed to assure pedestrian safety. Since the inception of Administrative Rule 8.12 we've seen a dramatic increase in projects with pedestrian walkways. There were only five active work zones with pedestrian walkways in 2016 versus 83 in 2018.



Pedestrian Access during Construction

PEDPDX OBJECTIVES ADDRESSED



The enforcement program seeks to increase compliance with policies through education and penalties. Since its inception in 2018 over 60% of all enforcement cases documented pedestrian travel as being affected by work that was unpermitted or in violation of issued permits. The enforcement program is primarily complaint driven. PDX Reporter allows Portlanders to report problems related to pedestrian access through and around work zones, resulting in inspection and enforcement. Pedestrians can report problems online at www.pdxreporter.org.

Development, Permitting and Transit (DPT) Group is currently working with traffic services such as Google maps to get ROW impacts out to the public, we are also actively working toward a public facing City-wide map detailing ROW impacts that could potentially have a subscription service for an area of interest. A notification system making residents aware of construction-related changes to pedestrian access, particularly for those with disabilities, would be a significant improvement.

Considerations

Managing a City-wide online map of ROW impacts requires constant monitoring and updates by staff and getting down to the pedestrian level can be quite time consuming especially for short duration, less than a 2-hour, impact. There's also a dependency on those working in the ROW to notify or permit all impacts through DPT which can be difficult to enforce. Developing an acceptable level of performance is necessary knowing that we may not get to 100% compliance.

Strategy 8

Construct and maintain obstruction-free sidewalks

ACTION 8.12

PEDPDX OBJECTIVES ADDRESSED



Educate about parking violations at driveways and crosswalks.

Vehicles parked in a driveway in a manner that obstructs pedestrian travel on the sidewalk, or that blocks access to crossings and curb ramps is not just an inconvenience to people walking, but an accessibility issue to people with disabilities. Cars parked across the sidewalk can force people in wheelchairs or blind pedestrians out into the roadway. Participants in the PedPDX Disability Workshop identified the need to better educate residents about the impacts that cars parked across sidewalks and crossings have on Portlanders with visual and mobility impairments.

The PBOT ADA Coordinator will explore avenues to increase awareness of the importance of keeping parked vehicles clear of sidewalks, crossings, and curb ramps. Potential methods may include providing educational materials for illegally parked cars about the importance of keeping the sidewalk clear for people walking and rolling.

Considerations

PDX Reporter allows Portlanders to report problems and maintenance issues to City bureaus, including instances of illegal parking. PDX Reporter is available in app format as well as via web app at www.pdxreporter.org.



Obstructed Sidewalk

ACTION 8.13

PEDPDX OBJECTIVES ADDRESSED



Work with the disability community to develop trip planning assistance.

At the PedPDX Disability Workshop, participants noted that pedestrians with disabilities often do not know where the most accessible routes to destinations may be. Sometimes routes may be missing curb ramps or may not provide audible signals, or work zones may temporarily alter pedestrian access. Focus group participants noted that an online trip planning map or other interactive resource could help pedestrians with disabilities see where infrastructure is in place and help identify accessible routes.

The PBOT ADA Coordinator will collaborate with community groups and third-party developers to explore the feasibility of developing a trip planning app to assist disabled pedestrians with finding accessible routes.



Non-Accessible Route

Considerations

While PBOT is not equipped to develop a trip planning app in house, the City can share data regarding the existence and location of curb ramps, sidewalks, marked crossings, and accessible signals.

Strategy 8

Construct and maintain obstruction-free sidewalks

ACTION 8.14

PEDPDX OBJECTIVES ADDRESSED



Develop a public reporting system and a process for addressing drainage issues at curb ramps with pooling water.

Curb ramps with pooling water can create an inconvenience for pedestrians walking through or around large puddles, and what's worse, an obstruction for disabled pedestrians who may not be able to veer out of path to avoid pooling water at corners. Pooling water at curb ramps can sometimes occur at older ramps where roadways have been repaved many times, altering roadway slopes and drainage patterns.

PDX Reporter allows Portlanders to report problems and maintenance issues to City bureaus. Residents can report issues related to campsites blocking the right-of-way, debris in the roadway, illegal parking, plugged storm drains, potholes, sidewalk café violations, sidewalk tripping hazards, sidewalk vegetation, and work zone access concerns. PDX Reporter is available in app format as well as via web app at www.pdxreporter.org.

The PBOT ADA Coordinator will work with PBOT Communications to update PDX Reporter to include a category for residents to report curb ramp concerns, including pooling water at curb ramps, and will coordinate with PBOT Maintenance Operations to develop a program and dedicated funding to address drainage issues at curb ramps with pooling water as reported.



Pooling Water at Curb Ramp

Considerations

PBOT Maintenance and Operations prioritizes resources for constructing new curb ramps in conjunction with maintenance paving projects or as requested by persons with disabilities. Increased focus on corner curb ramp maintenance may require additional funding and staffing to maintain PBOT's commitment to building new curb ramps.

PAGE INTENTIONALLY LEFT BLANK.

PAGE INTENTIONALLY LEFT BLANK.



STRATEGY 9

Pro-actively leverage, manage, design for, and set policies for new and emerging technologies

Emerging technologies have the potential to enhance pedestrian experiences, and planning for these new forms of mobility can shape how they are integrated into the network. Understanding how people use the pedestrian network through regular and systematic data collection will help us to plan for near and long-term needs. Identifying gaps in data and opportunities to fill those gaps through new technologies and policies may be implemented through this strategy.

Strategy 9

Pro-actively leverage, manage, design for, and set policies for new and emerging technologies

Table 17: Index of Strategy 9 Actions

ACTION	IMPLEMENTING VS. FUTURE ACTION	CATEGORY	LEADING ROLE
9.1 Articulate desired outcomes for pedestrians in the New Mobility Action Strategy.	Future Action	Policy	PBOT Policy, Innovation, and Regional Collaboration; PBOT Pedestrian Coordinator
9.2 Develop regular pedestrian counting systems and practices.	Future Action	Policy	PBOT Pedestrian Coordinator
9.3 Test new technologies and establish methods to collect better pedestrian data in Portland.	Future Action	Policy	PBOT Strategy, Innovation, and Performance; PBOT Policy, Innovation, and Regional Collaboration; PBOT Signals and Street Lighting

ACTION 9.1

PEDPDX OBJECTIVES ADDRESSED



Articulate desired outcomes for pedestrians in the New Mobility Strategy.

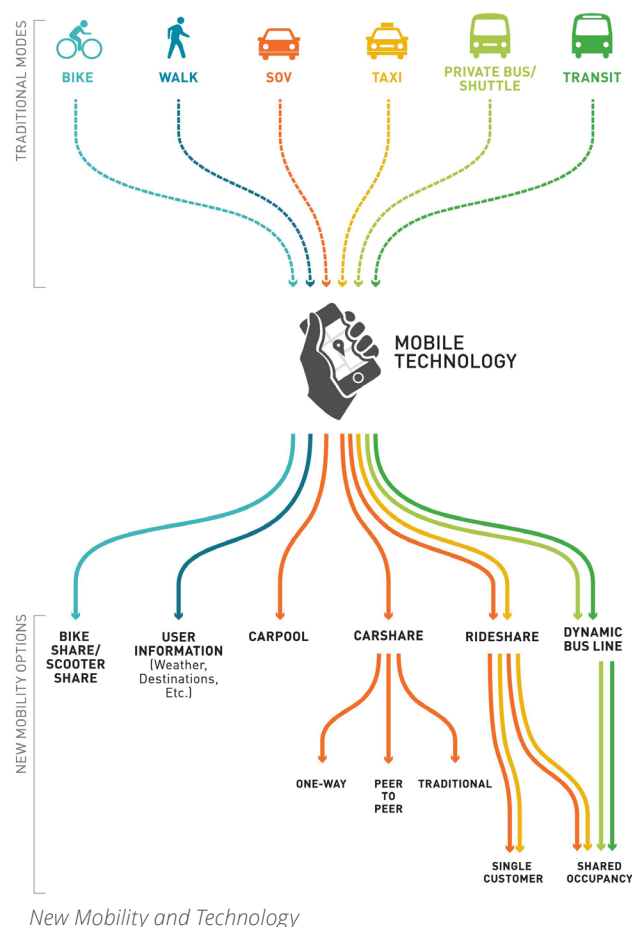
Consideration of pedestrian impacts should be a priority as new and emerging mobility options and technologies such as autonomous vehicles, electric scooters, and other new transportation modes are introduced in Portland. Limited curbside and sidewalk space means higher demand for that space, and it's important that pedestrian accessibility, comfort and safety remain top priorities as other modes compete for this space.

New modes and technologies contribute to complex interactions and behavioral dynamics among street users, introducing further challenges at intersection crossings, side streets, and driveways.

As an overarching strategic vision document for these new and emerging technologies, the New Mobility Action Plan will prioritize pedestrian needs throughout. In particular, management of and design for ride sourcing, scooter-share, bike share, and other mobility services, as well as testing and wide-scale deployment of autonomous vehicles, should reflect the City's existing policy to prioritize pedestrian safety, comfort, and accessibility in line with the City's adopted Transportation Strategy for People Movement (TSP Policy 9.6).

Considerations

All demands on the right-of-way must be balanced. As new modes and technologies are introduced in Portland, PBOT will actively monitor and seek to mitigate any potential impacts on pedestrian safety and comfort.



New Mobility and Technology



Strategy 9

Pro-actively leverage, manage, design for, and set policies for new and emerging technologies

ACTION 9.2

Develop regular pedestrian counting systems and practices.

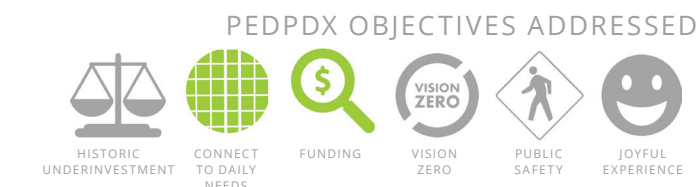
PBOT needs a better understanding of how people are traveling on the roadways. Better data on how and where people are traveling is important and can inform:

- How PBOT allocates and manages limited rights-of-way (including curb space).
- Infrastructure needs and investment decisions (based on usage, demand, and mode share targets).
- The effectiveness of infrastructure investments and Transportation Demand Management (TDM) strategies in impacting modal choices.

The need for better travel behavior data is especially critical for pedestrians. PBOT does not currently have a process or a program in place for regularly counting pedestrians. Consequently, it is not known how many people use PBOT's sidewalks and crossings (across the city generally, or in a given location), how pedestrian volumes compare to other modes, how those trends may or may not be changing over time, or what the potential demand might be for improved pedestrian facilities.

Regular data for measuring progress toward increasing non-automotive mode share is limited, and what data there is tends to significantly undercount pedestrian activity. Census commute data captures only a very small proportion of all trips taken, and significantly under reports pedestrian trips which tend to be off peak, often both in terms of time of day and time of week. Furthermore, census-reported commute trip data only reports on the primary mode of commute travel. Because walking tends to be only a piece of the commute trip (e.g., walking to transit stops), actual pedestrian activity in the city may be further underreported.

In recognition of the limitations of census commute trip data, many communities engage in surveys, which ask respondents to self-record data on how they get



Survey Pedestrian Counts

around for all trips taken during a given reporting period. However, because these surveys can be expensive and cumbersome, they are not always conducted at the frequency desired, nor at regular intervals. The Oregon Household Activity Survey was last conducted in Portland in 2011. Before that, the most recent survey of comparable depth and quality was conducted in 1994. Furthermore, active transportation activity is highly influenced by seasonal changes. Point-in-time surveys do not account for these changes in travel behavior over time.

The PBOT Pedestrian Coordinator will develop new pedestrian counting systems and practices for manually counting and regularly monitoring pedestrian activity in Portland. Priority locations for gathering regular pedestrian counts include high volume locations such as Pedestrian Districts and along Major City Walkways.

Considerations

New PBOT pedestrian counting systems and practices should coordinate with ongoing pedestrian counting activity by partners. Metro currently organizes annual pedestrian and bicycle counts at regional trail locations, and the Portland Downtown Business Association conducts annual pedestrian counts during the December holidays.

ACTION 9.3



Test new technologies and establish methods to collect better pedestrian data in Portland.

New data collection technologies are emerging that could help fill the gap in pedestrian activity data while simultaneously providing a broader understanding of modal choices and travel behaviors across the city. For example, cameras and sensors may have the capacity to collect automated count data for all modes at a given location. GPS and mobile phone tracking may have the potential to provide robust data on travel routes, origins, and destinations by mode, including capturing trips on all streets (not just arterials), where bicycle and pedestrian activity is often underreported.

PBOT actively evaluates new data collection and detection technologies. PBOT Signals and Street Lighting regularly tests passive pedestrian detection devices to help reduce the need for manual pedestrian push buttons and reduce pedestrian wait times at crossings. PBOT's Traffic Safety Sensor Project is currently testing new sensor technology on three High Crash Corridors to count and measure activity by mode.

PBOT's Strategy, Innovation, and Performance team will continue to lead the Bureau in testing and evaluating the efficacy of these and other emerging technologies to help provide PBOT with more robust data to help us better understand travel choices and patterns in the city. Such information will help inform how PBOT manages the rights-of-way, prioritizes investments, and measures and reports on effectiveness.

Considerations

Data gathered through cameras, sensors, and other technologies will be validated against manual traffic counts to determine the accuracy of these systems. PBOT has not yet confirmed the accuracy of any new passive detection or counting technologies, but will continue to evaluate new offerings as they become available.

PAGE INTENTIONALLY LEFT BLANK.



STRATEGY 10

Provide opportunities for an interesting and enjoyable pedestrian experience

Making walking in Portland a joyful experience is one of the six objectives of PedPDX. The Community Advisory Committee (CAC) consistently noted the value of a pedestrian environment that is inviting and that inspires a person to walk. The neighborhoods of Portland each have their own character, and walking through them can be interesting and enjoyable for residents and visitors. Elements, such as benches, “creative crosswalks,” wayfinding signs, and pedestrian events can help make that overall walking experience a joyful one.

Strategy 10

Provide opportunities for an interesting and enjoyable pedestrian experience

Table 19: Index of Strategy 10 Actions

ACTION	IMPLEMENTING VS. FUTURE ACTION	CATEGORY	LEADING ROLE
10.1 Establish a program for community implementation of “creative crosswalks.”	Future Action	Policy; Infrastructure	Portland in the Streets; City Traffic Engineer
10.2 Encourage seating in the right-of-way.	Future Action	Policy	Portland in the Streets
10.3 Work with partners to update the City’s pedestrian wayfinding system.	Future Action	Infrastructure	Portland in the Streets; PBOT Pedestrian Coordinator
10.4 Encourage more programs, events, and projects that create a car-free environment.	Future Action	Policy	Portland in the Streets
10.5 Integrate public art into capital improvement projects.	Future Action	Infrastructure	Portland in the Streets; PBOT Capital Delivery Division; Regional Arts and Culture Council
10.6 Engage and work with community partners to co-promote walking events that help people take ownership over investments and use new infrastructure.	Future Action	Education; Infrastructure	PBOT Equity Manager

ACTION 10.1

Establish a program for community implementation of “creative crosswalks.”

Marked crosswalks provide clear indication of where people driving can expect pedestrians to cross the street. They may also provide a special opportunity for creative placemaking, harnessing the creative energy of the community, cultivating a sense of neighborhood identity, and activating the right of way beyond just a vehicle travel-way.

PBOT’s Portland in the Streets Program helps residents activate public streets, sidewalks, and underutilized rights-of-way with community uses including play streets, “street seats,” community events and farmers’ markets, block parties, pedestrian plazas, street painting, and more. The program guides community members through the process for permitting community uses and place-making in the right-of-way and helps connect residents to grant resources to help fund community-initiated placemaking efforts.

In response to increasing number of requests from community members, the Portland in the Streets Program is in the process now of developing policies, processes, and design guidelines for community-initiated “creative crossings” including painted crosswalks and painted corner curb extensions. Requests for creative crossings will be reviewed and permitted through the Portland in the Streets Program.

PEDPDX OBJECTIVES ADDRESSED



Creative Crosswalk

Considerations

Creative crossings need to consider the location and functional classification of the facilities involved. These locations should exclude school crossings, school zones, or crossings involved with the Safe Routes to School program. The City of Portland does not have a dedicated funding source for creative crossings. Therefore, the applicant will need to raise the funds necessary for procurement of materials, applications fees, and continuing maintenance. The creative crossing program will include a stewardship program to maintain areas that are inaccessible to normal street cleaning efforts.

Strategy 10

Provide opportunities for an interesting and enjoyable pedestrian experience

ACTION 10.2

PEDPDX OBJECTIVES ADDRESSED



Encourage seating in the right-of-way.

Street seating is an important pedestrian amenity that provides people with a place to wait, rest, eat/drink, and congregate. Street seating can contribute significantly to the vitality of a streetscape, enhancing local business, and social activity, increasing eyes on the street, and softening the streetscape as a place to be rather than pass through. Street seating is also important for aging residents, providing places to rest while walking.

PBOT currently provides an avenue for permitting sidewalk benches through an encroachment permit. However, this process may not be broadly-known, and business associations, community groups, business owners, and others who may be interested in providing benches may not know that the option exists. Furthermore, the existing permitting parameters make it difficult for creative bench designs.

PBOT's Portland in the Streets program will develop strategies for encouraging creative bench design and encouraging residents to sponsor and provide more benches in the right-of-way. Such strategies could mirror PBOT's successful "Street Seats" program in terms of process and design requirements.



Creative Seating in Right-of-Way

Considerations

ADA accessibility requirements may impact design requirements for creative benches.

ACTION 10.3



Work with partners to update the City's pedestrian wayfinding system.

The City of Portland pedestrian wayfinding signs were installed in downtown and the Lloyd District in the mid 2000's through a partnership with PBOT, Portland State University, Go Lloyd, the Portland Business Alliance, and Prosper Portland. At its inception, the wayfinding sign program relied on local business sponsorship money to maintain and update the signs. Those sponsorships were good for a period of two years and when it came time for the sponsorships to be renewed, very few businesses continued sponsorship. For many years now, there has not been a continuous funding source to maintain and update the signs as needed and they have fallen into disrepair or obscurity. Consequently, we have maps that have been sadly out of date, display incorrect information, and have been covered in graffiti for years.

The existing signs are not only out of date and incorrect but are also now redundant with the many recent TriMet, Portland Streetcar, and BIKETOWN wayfinding signs that can be found throughout the Central City. In addition to the many static wayfinding signs on the ground, the majority of people have smart phones with interactive map capabilities.

The City needs a new system that is multi-modal and facilitates easy transfer between walking, biking, taking transit, and driving. The nature of wayfinding has changed since Portland's signs were installed over a decade ago. The best wayfinding systems are designed not only to provide a map potentially redundant to the one found on a smart phone, but to facilitate multi-modal travel. In

addition to identifying pedestrian routes and destinations, a good wayfinding system also increases the legibility of bike and transit routes to help facilitate transfers between these modes in recognition of the new multi-modal ways that people travel today. There are also emerging opportunities to integrate static maps within the right-of-way with an online digital interface.

Success for these types of wayfinding systems largely depends on establishing an ongoing program with dedicated funding to own and maintain the maps and furniture. There are opportunities to seek grant funding or partner with other organizations on funding, design, and planning for this effort.

PBOT staff will work with community partners, including BIKETOWN, TriMet, Portland Streetcar, the Portland Business Alliance, Travel Portland, Go Lloyd, and Neighborhood Associations wishing to install and maintain wayfinding signs to comprehensively update Portland's pedestrian wayfinding system and develop a management system for ongoing maintenance and management.

Considerations

A successful wayfinding system requires a dedicated ongoing funding source and staff time for ongoing management. Establishing a working partnership to update Portland's wayfinding system will likely be a very large, multi-year task.

Strategy 10

Provide opportunities for an interesting and enjoyable pedestrian experience

ACTION 10.4

PEDPDX OBJECTIVES ADDRESSED



Encourage more programs, events, and projects that create a car-free environment.

Throughout the PedPDX process, residents have voiced strong interest in “reclaiming” street space for pedestrians through establishing “car-free” streets via programs, events and projects.

PBOT’s Sunday Parkways program has been a national leader in temporarily closing streets to car traffic on designated days to allow car-free walking and biking and community events in the street.

PBOT’s Portland in the Streets program provides avenues through which Portland resident may temporarily close streets to vehicle traffic for community uses, including play streets, community events, farmers markets, block parties, and the beautification/activation of an underutilized portion of the Right-of-Way. The program also provides an avenue through which car-free zone demonstration projects may be requested by the community and tested. Portland in the Streets programs “Pedestrian Plazas” and “Spaces to Places” provide permanent, car-free environments.

Portland in the Streets will work to expand community awareness of existing community-initiated “car-free” place-making opportunities, as well as identify opportunities for City-led demonstration projects, potentially integrated with capital projects.



Car Free Streets

Considerations

All closure requests will be evaluated by City Staff to determine if they are appropriate locations. Closure of streets to vehicles must be approved by the City Traffic Engineer.

ACTION 10.5



Integrate public art into capital improvement projects.

A great walking city is more than just sidewalks and crosswalks. It's also about quality of place and the multi-sensory experience of walking in the city. Art in the public realm enhances helps connect people to place. Art in the public realm can take many forms including street murals, surface treatments, unique lighting, decorative materials, sculptural elements, or even may be temporal or performance based.

PBOT occasionally works with the Regional Arts & Culture Council (RACC) to include public art installations in conjunction with capital improvement projects. It is City of Portland policy to dedicate two percent of total eligible costs of all improvement projects (including transportation projects) to a public art fund, which is managed by RACC. Use of these funds is not very common in conjunction with transportation capital projects, but better communication between PBOT and RACC and better informing PBOT project managers of the available funds and how to use them could help bring more art to Portland's streets.

The PBOT Capital Delivery Division will coordinate with Portland in the Streets to improve processes for integrating public art into capital projects. Process improvements may include bringing an artist-in-residence to PBOT. Additionally, Portland in the Streets will expand its programmatic offerings to encourage and permit community-initiated art in the right-of-way.

Considerations

The mechanism for both allocating the funding to RACC and using the funding can be very confusing and tedious for project managers, which makes them less inclined to add art to their capital projects. Better communication and procedures are needed to make use of this program.



Art in the public realm can make walking a more joyful experience (photo credit Regional Arts and Culture Council)

Strategy 10

Provide opportunities for an interesting and enjoyable pedestrian experience

ACTION 10.6

PEDPDX OBJECTIVES ADDRESSED



Engage and work with community partners to co-promote events that help people take ownership over investments and use new infrastructure.

In historically underserved communities, investments in walking and biking infrastructure are sometimes associated with threats of gentrification, rising rents, and too little investment too late. While fear of future impacts should not deter us from making critical safety investments in neighborhoods that critically need them, pedestrian safety improvements should be seen as investments in existing residents, rather than forces for displacement.

The PBOT Equity Manager will work with community partners to organize events that encourage residents to embrace new infrastructure and build a sense of ownership and community around it. Block parties, community walks, demonstrations, and other events can be permitted and coordinated with the Portland in the Streets team and could help residents take ownership of City investments in their neighborhoods.



Shared Infrastructure

Considerations

Finding messaging and partners to help build community ownership over new investments is a difficult task that will require intensive community building and outreach.

PAGE INTENTIONALLY LEFT BLANK.

PAGE INTENTIONALLY LEFT BLANK.



STRATEGY 11

Work with developers, residents, and property owners to provide pedestrian improvements

The PedPDX Community Advisory Committees stressed the importance of near-term action to solve problems. Leveraging multiple sources of funding and opportunities for cost-efficiencies is a way to increase effectiveness, given limited resources. In Portland, pedestrian improvements are provided by a variety of programs and activities that require participation from developers, property owners, and residents.

Actions to make it easier and more affordable for sidewalks to be constructed will enable each group to contribute to enhancing the city's pedestrian network.

Strategy 11

Work with developers, residents, and property owners to provide pedestrian improvements

Table 20: Index of Strategy 11 Actions

ACTION	IMPLEMENTING VS. FUTURE ACTION	CATEGORY	LEADING ROLE
11.1 Update the 1998 pedestrian design guidelines to guide future frontage improvements made in conjunction with private development.	Future Action	Policy	PBOT Pedestrian Coordinator
11.2 Explore a fee program for development activity on arterial and collector streets as an alternative to building required sidewalk improvements where individual frontage improvements may not be practicable.	Future Action	Policy	PBOT Policy, Innovation, and Regional Collaboration; PBOT Development Permitting and Transit
11.3 Update our approach to local improvement districts and waivers of remonstrance.	Future Action	Policy	PBOT LID Manager
11.4 Provide a pathway for residents, property owners, and businesses to self-fund pedestrian improvements not prioritized for City investment.	Future Action	Policy	PBOT Active Transportation Division
11.5 Update design guidelines to require pedestrian improvements on unimproved rights-of-way as part of the development review process.	Future Action	Policy	PBOT Development Review; PBOT Bridges and Structures

ACTION 11.1

PEDPDX OBJECTIVES ADDRESSED



Update the 1998 pedestrian design guidelines to guide future frontage improvements made in conjunction with private development.

PBOT's Development Review group reviews and permits all street and frontage improvements associated with private development. In Portland, private development is typically required to make street frontage improvements along the property in the course of a development project. This includes providing or improving sidewalks in a manner consistent with the City's Pedestrian Design Guide.

The Pedestrian Design Guide integrates a range of pedestrian design criteria and practices into a coherent set of guidelines that, over time, promote a walkable city. It establishes sidewalk design criteria, including requirements for minimum sidewalk widths, street tree placement, and street corner design at crossings. Every sidewalk or crossing designed and built in the City of Portland is required to conform to these guidelines. These are the guidelines the City of Portland uses in our own capital projects, and they are the same guidelines required of private development. City staff ensure these guidelines are met by private development through the development review process.

Largely impacting frontage improvements, the Pedestrian Design Guide provides a critically important mechanism for leveraging privately-funded pedestrian improvements in the city over time. A large proportion of new sidewalks constructed or improved in Portland over time have been provided in conjunction with private development activities.

Subsequent to the adoption of PedPDX, the PBOT Pedestrian Coordinator will lead the effort to update Portland's Pedestrian Design Guide to reflect PedPDX.

Considerations

The Pedestrian Design Guide has successfully leveraged pedestrian improvements from private development activities over the last 20 years. Whether integrated into a comprehensive set of right-of-way design guidelines or a standalone document, future pedestrian design guidelines should not dilute the influence of the 1998 Pedestrian Design Guidelines.



Sidewalk Frontage Improvements

Strategy 11

Work with developers, residents, and property owners to provide pedestrian improvements

ACTION 11.2



Explore a fee program for development activity on arterial and collector streets as an alternative to building required sidewalk improvements where individual frontage improvements may not be practicable.

Per City charter and City Code, property owners are responsible for constructing, maintaining, and repairing the sidewalks abutting their property. This applies to home owners, business owners, schools and other large institutions. Traditionally the requirement to construct sidewalks where they are missing or deficient is triggered when development or redevelopment projects occur. As part of the development, PBOT requires property owners to construct or improve the sidewalks fronting their property in accordance with City standards. This is how the majority of sidewalks have historically been built in the City of Portland. The mature sidewalk system in inner Portland that was constructed with development (often over 100 years ago) still serves residents today.

However, in some locations it is not always practicable to build sidewalks on a frontage-by-frontage basis. In Southwest Portland, the hilly terrain combined with the lack of stormwater infrastructure in the right-of-way makes a few feet of sidewalk construction on a corridor lacking pedestrian or stormwater facilities extremely costly.

Historically when faced with these types of constraints, PBOT has allowed development to proceed but with the expectation that the property will be responsible for making sidewalk improvements when a local improvement district (LID) is formed. As a result, in some locations new development has not provided new pedestrian

infrastructure to serve those developments. In particular, many of Southwest Portland's busy arterial and collector streets still lack pedestrian walkways.

In response to this problem, PBOT has implemented a new Local Transportation Infrastructure Charge (LTIC) for new infill development on local streets within single-dwelling residential zones. The LTIC fee program allows developers to pay a fee commensurate with the cost of constructing required frontage improvements. PBOT then uses these fees to construct comprehensive sidewalks and street improvements on local streets.

While the LTIC helps address environmental and feasibility constraints of building sidewalks on local streets, it does not apply to busy arterial streets where there is even greater demand for safe pedestrian walkways. Many of these busy streets are classified as Major City Walkways and City Walkways, and provide pedestrian access to transit and schools.

PBOT's Development Permitting and Transit Group will explore establishing a fee program for developers on arterial and collector streets to pay into as an alternative to building frontage improvements. Staff will also evaluate the possibility of expanding the existing LTIC fee program to neighborhood collector streets.

Considerations

A new fee program as an alternative to building frontage improvements will require City Council approval.

PAGE INTENTIONALLY LEFT BLANK.

Strategy 11

Work with developers, residents, and property owners to provide pedestrian improvements

ACTION 11.3

Update our approach to local improvement districts and waivers of remonstrance.

Historically when sidewalk construction is deemed infeasible or impracticable due to environmental constraints or lack of infrastructure to connect to, PBOT requires a “waiver of remonstrance” from the developer or property owner in lieu of requiring a street improvement. These waivers mean that a property is automatically counted as a “yes” vote to establish a future Local Improvement District (LID) to fund street improvements, and waives their right to remonstrate (or object) against the formation of an LID. Waivers also serve an important function in that they disclose to property owners their future responsibility to share in the cost of street improvements when those LIDs are formed. Waivers of remonstrance follow the property from owner to owner and are passed down from developers.

An LID is a method by which a group of property owners shares in the cost of street improvements including building sidewalks, paving streets, and providing stormwater infrastructure. Property owners opting in (or who have agreed to waive their right to object) make payments on the street improvements for up to 20 years.

LIDs are most commonly used to improve unpaved streets. LIDs have also been successfully used to provide sanitary sewer, water main improvements, traffic signal and utility undergrounding improvements in conjunction with street improvements for economies of scale to provide comprehensive and complete infrastructure solutions to neighborhoods.

Over the last century, Portland has expanded by annexing unincorporated land from Multnomah County. Most of the annexed area had already been developed prior to being added to the City and sidewalks were often not constructed as part of that development. Many of these annexed areas still retain some of their rural character, and they continue to have insufficient infrastructure to meet the needs of people walking.

The City has many waivers of remonstrance on record that date back several decades. However, as currently structured, residential LIDs are often not affordable for property owners, even when the cost of the infrastructure is spread out over 20 years.

PBOT staff will continue to evaluate opportunities to update our approach to LIDs in order to expand the application of this tool for building sidewalks and other street improvements in neighborhoods with inadequate pedestrian infrastructure. Potential updates to our approach to LIDs could include evaluating opportunities to reduce the cost of new infrastructure, and/or coupling property owner LID financing with City subsidy. Additionally, PBOT staff will work with elected officials to determine how to address existing waivers of remonstrance.

PEDPDX OBJECTIVES ADDRESSED



Sidewalk Construction

Considerations

Some existing waivers of remonstrance are decades old and current property owners may not be in favor of paying the costs associated with LID street improvements. Lower-cost street improvements applying the alternative pedestrian walkways described in Action 5.1 may help reduce the costs of providing pedestrian infrastructure in some areas.

LIDs must be approved by City Council, and Council may not approve new LIDs if there is enough opposition from property owners, even if those property owners have waivers of remonstrance associated with their property.

Strategy 11

Work with developers, residents, and property owners to provide pedestrian improvements

ACTION 11.4

PEDPDX OBJECTIVES ADDRESSED



Provide a pathway for residents, property owners, and businesses to self-fund pedestrian improvements not prioritized for City investment.

Given the immense need for pedestrian improvements in Portland, PedPDX establishes a prioritization to ensure that public funds are allocated to locations with the greatest need first. However, needs not prioritized for near-term City investment are still needs. While not always a City safety priority, PedPDX acknowledges residents' desires to provide traffic calming, crossing improvements, sidewalk repairs, and other walking improvements on the streets they use every day.

The PBOT Active Transportation Division will lead an initiative to develop a pathway for residents, property owners, and business to self-fund pedestrian improvements not prioritized for City investment. This may include distributing resources to help residents seek grants or fundraise, developing better systems that allow PBOT crews to construct privately-funded improvements, working with City officials to establish financing mechanisms for small-scale improvements where LIDs are not practicable, and working with the Commissioner's office to set up revolving "micro-loans."

Considerations

While many neighborhoods in Portland may be able to fundraise or collectively self-fund desired improvements, less affluent neighborhoods may not. Establishing new pathways to facilitate self-funded pedestrian improvements will require addressing these equity concerns. One approach may be to model new programs on Portland Public Schools, which allows local PTA's and school foundations to self-fund various school programs and resource needs, provided that a percentage of funds are set aside for low-income schools.

Strategy 11

Work with developers, residents, and property owners to provide pedestrian improvements

ACTION 11.5

PEDPDX OBJECTIVES ADDRESSED



Update design guidelines to require pedestrian improvements on unimproved rights-of-way as part of the development review process.

Unimproved rights-of-way are street segments that have a dirt, gravel, or substandard pavement surface. Sometimes unimproved rights-of-way are completely unimproved and are merely platted “paper streets” with no walking or driving surface at all.

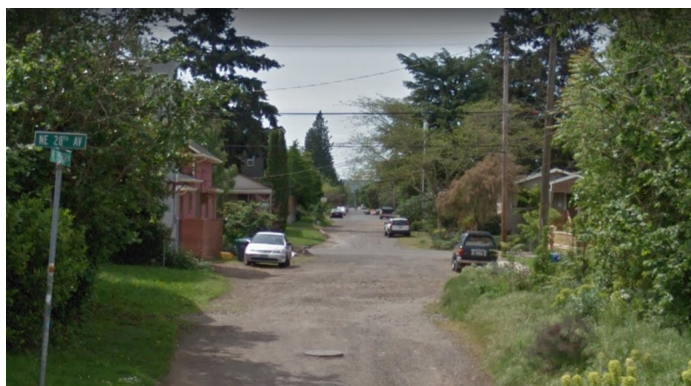
Narrow unimproved rights of way are often good candidates for paths or stairways. These underutilized right-of-way segments can present low-cost opportunities to increase pedestrian connectivity, particularly in neighborhoods where the street grid is irregular or widely spaced and pedestrian connectivity is limited.

PedPDX identifies several unimproved or pedestrian-only paths in the right-of-way as part of the Pedestrian Priority Network as Neighborhood Walkways. Historically PBOT Development Review has not required pedestrian or other frontage improvements along unimproved “paper streets” where there is no vehicular access or terrain is steep.

Moving forward, PBOT Development Review will require frontage improvements on adjacent unimproved rights-of-way included as Neighborhood Walkways in the PedPDX network when properties redevelop. Such frontage improvements may include pedestrian paths and/or stairs.

Considerations

Design guidelines for pedestrian paths are presented in Action 5.1. Pedestrian paths should consider lighting needs, particularly when serving as a walking route to school or at locations used by seniors. Where topography is steep, a staircase may be provided when an accessible route is provided on the nearest full street connection.



Unimproved Street

PAGE INTENTIONALLY LEFT BLANK.



STRATEGY 12

Address public safety and security concerns for people walking on City sidewalks

Addressing issues of safety and security in the pedestrian network is particularly important in areas where people do not have other transportation options and in areas that have historically been underserved. Actions focused on under-served communities reinforce our commitment to equity and eliminating disparate outcomes due to race. Walking While Black Focus Group participants, and the Walking Stories documented as part of this Plan, highlighted the issues people of color face on a daily basis.

Strategy 12

Address public safety and security concerns for people walking on City sidewalks

Table 21: Index of Strategy 12 Actions

ACTION	IMPLEMENTING VS. FUTURE ACTION	CATEGORY	LEADING ROLE
12.1 Increase lighting per new street lighting level guidelines, focusing investment in underserved communities.	Future Action	Infrastructure; Funding	PBOT Signals and Street Lighting
12.2 Partner with other agencies and City bureaus to advance the well-being and personal security of vulnerable communities as they use Portland transportation infrastructure.	Future Action	Policy; Education	PBOT Equity Manager
12.3 Continue research on racial bias and driving behavior.	Future Action	Education	PBOT Equity Manager

ACTION 12.1

Increase lighting per new street lighting level guidelines, focusing investment in underserved communities.

Street lighting is critical in terms of helping pedestrians navigate sidewalks and crossings and being seen by people driving in low-light conditions. Beyond improving traffic safety however, street lighting also helps provide a greater sense of personal safety and security for people walking. Focus group discussion about lighting led to a deeper understanding about concerns for personal safety in public spaces and during travel commutes. Participants shared the choices they make on a daily basis to travel on routes that make them feel safe and visible, even if the travel route is longer or the travel option is more expensive

Participants at the PedPDX “Walking While Black” focus group strongly voiced a need for more and better street lighting. The number one barrier to walking identified by participants was poor lighting. In response to this strong advocacy for more street lighting in communities of color, PBOT Signals and Street Lighting has updated the City’s street lighting level guidelines. Those updated lighting guidelines will result in more well-lit streets, sidewalks, and crossings.

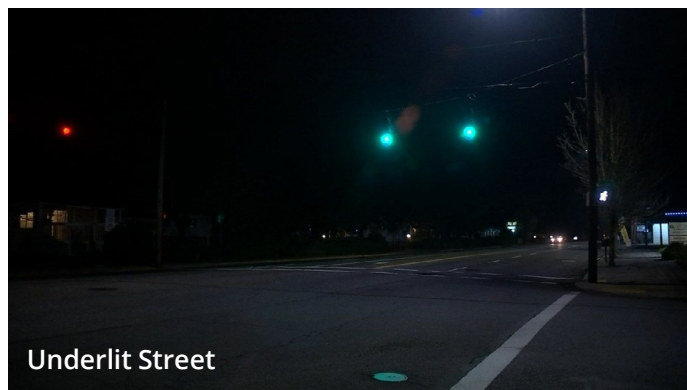
Recognizing that underserved communities in Portland evidence higher rates of pedestrian crashes and a greater need for intervention, lighting investments will be prioritized in areas identified through the PBOT Equity Matrix and the PedPDX composite network prioritization. As described in Action 6.2, PBOT will develop a strategic investment plan to improve lighting conditions and pedestrian visibility on our streets. Efforts will focus on High Crash Corridors and intersections, Pedestrian Priority Streets, and in historically underserved areas.

PEDPDX OBJECTIVES ADDRESSED



“Lighting is very important if we really want to protect Black lives, not everyone has shiny clothes on them. Proper lighting especially helps people with dark skin. If we had enough light everywhere, it would be safer citywide to walk while Black. White drivers don’t see Black people, even in [the] daytime.”

- Walking While Black Focus Group participant



Considerations

Increasing light levels may encounter some opposition from groups advocating for darker skies. LED street lights have largely eliminated uplight, the light shining directly upward, but light reflected from the pavement will still impact dark skies.

Dark sky advocates may request color temperatures of 3000K or below, yet the best color contrast currently available to identify pedestrians using LED streetlights is 4000K. New developments in LED technology may improve color rendering at lower color temperatures.

Strategy 12

Address public safety and security concerns for people walking on City sidewalks

ACTION 12.2

PEDPDX OBJECTIVES ADDRESSED



Partner with other agencies and City bureaus to advance the well-being and personal security of vulnerable communities as they use Portland transportation infrastructure.

While much of PBOT's work is related to preventing crashes and improving traffic safety in the right-of-way, the element of personal safety and security is often ignored by transportation professionals. We know from community outreach, however, that concerns about personal safety and security significantly impact the transportation choices of many non-white residents.

Feedback from PedPDX's "Walking While Black" focus groups suggested ways PBOT can help people, especially minorities, feel safe from street harassment when using the street. Many people discussed how they are afraid of walking in their own neighborhoods after being harassed in the right-of-way. Since 2016, Oregonians have reported over 30 "hate incidents," a higher rate than any other state, according to Southern Poverty Law Center data. In May 2017, two White men were stabbed to death, and another seriously injured, when they intervened to protect victims from an act of racist violence on a MAX train. The targets of the White, male perpetrator were two young, Black teenage women, one wearing a hijab.

In response, the Portland United Against Hate Coalition (PUAH) was formed to closely track incidents of hate and elevate concerns on community safety. The PBOT Equity Manager will identify opportunities to coordinate with community groups and other partner agencies, including PUAH and the Office of Civic Life crime prevention team, to develop actions, programs, tools, and resources to address street harassment in Portland and educate the

public about what to do when they feel threatened in the right-of-way. These tools and resources could be distributed at PBOT events, through SmartTrips and Safe Routes to School programs, and online.



Considerations

PBOT has no legal authority over public harassment complaints in the public realm. This action will require the Portland Police Bureau's help to enforce current laws. This action will require extensive community and partner agency input to develop the tools and resources in support of anti-hate work.

ACTION 12.3

PEDPDX OBJECTIVES ADDRESSED



Continue research on racial bias and driving behavior.

A 2005 study performed by researchers at Portland State University found that drivers are less likely to stop for Black pedestrians waiting in a crosswalk than for White pedestrians⁹. The study found that Black male pedestrians were passed by twice as many cars as, and waited 32% longer than, White male pedestrians. A later study found that at unmarked crosswalks, drivers' stopping compliance was very low but few differences emerged based on pedestrian race and gender. At marked crosswalks, drivers were more likely to stop, but exhibited a racial/gender bias and were less likely to stop for Black pedestrians. When they did stop, they were more likely to stop closer to the Black pedestrian.

The vision of PedPDX is to make Portland a great walking city for all. Accomplishing this requires us to have a better understanding of the different set of challenges faced by non-white people walking on Portland streets. The PBOT Equity Manager will advocate for and coordinate with community partners to for continued research to better understand discrepancy in driver behavior toward non-white pedestrians and develop tools and policies to increase driver compliance at crosswalks when people of color are present.



Black male pedestrians were

PASSED BY TWICE AS MANY CARS

AND

WAITED

32% longer to cross the street

than white male pedestrians.

Source: 2005 Portland State University Study⁹

Considerations

This action will require the PBOT's Equity Manager to coordinate with university and other researchers.

⁹ Tara Goddard, Kimberly Barsamian Kahn, Arlie Adkins, Racial bias in driver yielding behavior at crosswalks, Transportation Research Part F: Traffic Psychology and Behaviour, Volume 33, 2015, Pages 1-6, ISSN 1369-8478, <https://doi.org/10.1016/j.trf.2015.06.002>

PAGE INTENTIONALLY LEFT BLANK.



STRATEGY 13

Use education and outreach to help Portlanders keep themselves safe while walking

Outreach and education programs complement infrastructure design to keep Portlanders safe while walking. Project stakeholders expressed the need for more expansive education efforts for all roadway users and highlighted the need for extensive messaging, communication, and education, as was heard in the Walking While Black and Disability Focus Groups. Actions are tailored to address safety for vulnerable users and all ages and abilities.

Strategy 13

Use education and outreach to help Portlanders keep themselves safe while walking

Table 22: Index of Strategy 13 Actions

ACTION	IMPLEMENTING VS. FUTURE ACTION	CATEGORY	LEADING ROLE
13.1 Expand safety education/outreach focusing on people walking.	Future Action	Education	PBOT Vision Zero
13.2 Expand pedestrian safety education programs targeted to seniors.	Future Action	Education	PBOT Vision Zero
13.3 Expand pedestrian safety education programs targeted to school children.	Future Action	Education	Safe Routes to School

PAGE INTENTIONALLY LEFT BLANK.

Strategy 13

Use education and outreach to help Portlanders keep themselves safe while walking

ACTION 13.1

Expand safety education and outreach focusing on people walking.

While PBOT is committed to providing safer infrastructure on our roadways and increasing safe driving behaviors, educating Portlanders about how to keep themselves safe while walking could also help avoid death and injury on our streets. It is important that people walking know how to anticipate driver movements, know how and when they are/are not visible to drivers, and understand how to keep themselves safe in dangerous situations (including in dark conditions, when pedestrian crashes increase in Portland). These sorts of “defensive walking” tactics are not “victim blaming,” but practical and potentially life-saving strategies that people walking on Portland streets should be equipped with as we continue to make strides creating safer streets and increasing driver awareness.

PBOT currently supports an array of pedestrian safety programs, such as TriMet’s “Be Seen. Be Safe.” campaign. The SmartTrips program encourages walking through guided walks and supplying maps to help guide pedestrians. Other pedestrian outreach and education efforts PBOT currently participates in or leads include:

- Scheduled in-classroom and “Walk & Talk” trainings that includes an in-classroom training followed by a walk and discussion outside. Trainings are available city-wide for all community members with a priority focus of promoting the trainings to community members located on or near Vision Zero high crash network streets and community members with limited English proficiency skills.
 - PBOT educational online videos including Every Corner is a Crosswalk, Oregon Walks – Be Safe, and Beacon Buddies.
 - Promoting The Street Trust’s “Oregon Friendly Driver” program and other traffic safety classes on the PBOT Traffic Safety Resources webpage.
- PBOT Street Team outreach and education efforts include positioning two or more staff and community volunteers at locations that have a high amount of pedestrian activity and handing out Vision Zero safety information and pedestrian safety and flashing lights to people walking on the sidewalk, getting on or off the bus, and people crossing the street. Locations that are on a Vision Zero high crash network street are prioritized over non-high crash network streets.



Be Safe Training

PEDPDX OBJECTIVES ADDRESSED



- Portland Police Bureau driver safety classes for immigrant and refugee adults include in-classroom trainings and behind-the-wheel driver experiences. Each participant receives training about Oregon traffic laws including Oregon crosswalk laws and how to be safer when walking and driving.

PBOT Vision Zero will significantly expand current pedestrian safety education efforts and seek to reach a broader audience. This will include reaching out to populations at highest risk for pedestrian crashes and non-native English speakers. This could include (but is not limited to) broad reaching media campaigns, expanding PBOT's SmartTrips education program, site-specific educational efforts within sidewalks and at crossings, and collaborating with community partners.

Considerations

Significantly expanding outreach and education efforts will be reliant upon available funding.



Educational Tour

Strategy 13

Use education and outreach to help Portlanders keep themselves safe while walking

ACTION 13.2

PEDPDX OBJECTIVES ADDRESSED



Expand pedestrian safety education programs focusing on seniors.

Pedestrians ages 65 and older accounted for 19% of all pedestrian deaths in the USA and an estimated 13% of all pedestrians injured in 2015. (National Highway Traffic Safety Administration. Traffic Safety Facts 2015 Data). As we age, our peripheral vision and hearing diminishes, our balance can be compromised, stiff joints and muscles can make it harder to check traffic before we step out, and we are less quick to respond to and less likely to heal from a crash.

Outreach programs for seniors helps to address the needs of this specific group of pedestrians. Opportunities for older adults may not be well known to the older adults themselves. Education about the benefits of and safety strategies for walking can help to encourage and increase these activities. Public relations campaigns can increase awareness of safe pedestrian pathways for older adults and the laws related to pedestrians for bicyclists and drivers. Seminars for older adults can increase understanding and awareness of recent developments in infrastructure design, policies, or programs to support safe walking.

Current encouragement and education programs that the City offers for seniors will be continued and expanded. This could include encouragement programs and activities, working collaboratively with community and non-profit partners such as Parks and Recreation and AARP, and working with older residents to identify places in the street network where they do not feel comfortable (for example, intersections where seniors feel there is not enough time to cross the street) and PBOT can provide improvements.

Pedestrians ages 65 and older accounted for

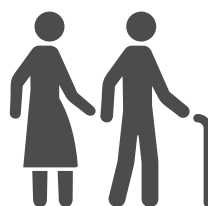
19%

OF ALL PEDESTRIAN DEATHS IN THE USA

AND AN ESTIMATED

13%

OF ALL PEDESTRIANS INJURED IN 2015



Source: National Highway Traffic Safety Administration. Traffic Safety Facts 2015 Data

Considerations

Many (if not most) of the infrastructure, design, and policy changes introduced in PedPDX will increase safety and comfort for all pedestrians, including older adults. Targeted safety and education efforts can help supplement these efforts and help ensure older adults feel safe walking in Portland.

ACTION 13.3

Expand pedestrian safety education programs focusing on school children.

Portland youth tend to be more multi-modal than their parents. Many young Portlanders are already navigating the city on foot and bike, by bus and MAX, and in cars. Beyond driver's education, traffic safety education for students is limited. Many young people mature enough to travel alone or with friends often have not had any safety training at all.

PBOT's Safe Routes to School program provides roadway safety improvements to make walking and biking to school safer for children. The PedPDX prioritization incorporates Safe Routes to School Primary Investment Routes and the Pedestrian Network Completion Program will support and complement Safe Routes to School program funding for safe walking infrastructure.

In addition to safety infrastructure, PBOT's Safe Routes to School program also encourages and incentivizes walking and bicycling to school and engages in safety education efforts teaching young people how to travel safely. Such efforts currently include:

- Meeting with youth to discuss transportation topics and personal safety in the right-of-way,
- Distributing safety education materials via schools and directly to families through the SmartTrips to School program,
- And working with schools to design education programs that work best for their school community.

PEDPDX OBJECTIVES ADDRESSED



Expanding safety training opportunities and ages receiving education will teach more young Portlanders how to travel on Portland streets. Maintaining consistent messaging from grades K-12 will help solidify these skills as second nature. PBOT's Safe Routes to School program will expand these student safety education efforts.

Considerations

Expanding Safe Routes to School trainings and educational efforts may rely upon available funding.



School Crossing

PAGE INTENTIONALLY LEFT BLANK.



ALTERNATIVE PEDESTRIAN WALKWAYS

Alternative Pedestrian Walkways are additional tools in the Implementation Toolkit that provide an alternative to sidewalks, when space, geography, topography, cost, or neighborhood preference do not allow or require a full sidewalk to be constructed.

Pedestrian Path Connection



DESCRIPTION

A Pedestrian Path Connection creates short walkway segment in a public right-of-way, independent from motor vehicular traffic. At narrow widths, these paths are appropriate for pedestrian-only use. Where topography is steep, a staircase may be used. Where additional width is available, the connection may be designed for bicycle and pedestrian use.

WORKS BEST WHERE

Roadway classification	Local
Max vehicle volume	N/A
Max posted speed	N/A
Safe Routes applicability	Yes
Traffic calming may be required	N/A

CONSIDERATIONS

In areas of steep slopes and topographical constraints, a staircase may be appropriate to establish a pedestrian connection. Designs should meet accessibility guidelines to the maximum extent possible. Consider the use of wheel runnels for bicycle accommodation.

KEY DESIGN ELEMENTS

- 1** A pedestrian-only connection should be designed to support side-by-side pedestrian use:
 - 10 ft width preferred;
 - 6 ft width minimum;
- 2** Adequate lighting is recommended along transportation pathways, for safety and security.
- 3** When intended for use by bicyclists, increased width is required
 - User separation is preferred over shared use in potential high-demand corridors.
 - Long distance shared use paths should meet national and local bikeway design guidelines.

OPTIONAL DESIGN ELEMENTS

- 4** Pay special attention to roadway crossings, including assignment of user priority, crossing enhancements and geometric design to create appropriate behavior.
- 5** Consider strategies to discourage unwanted use by motor vehicles.

PRECEDENT IMAGES

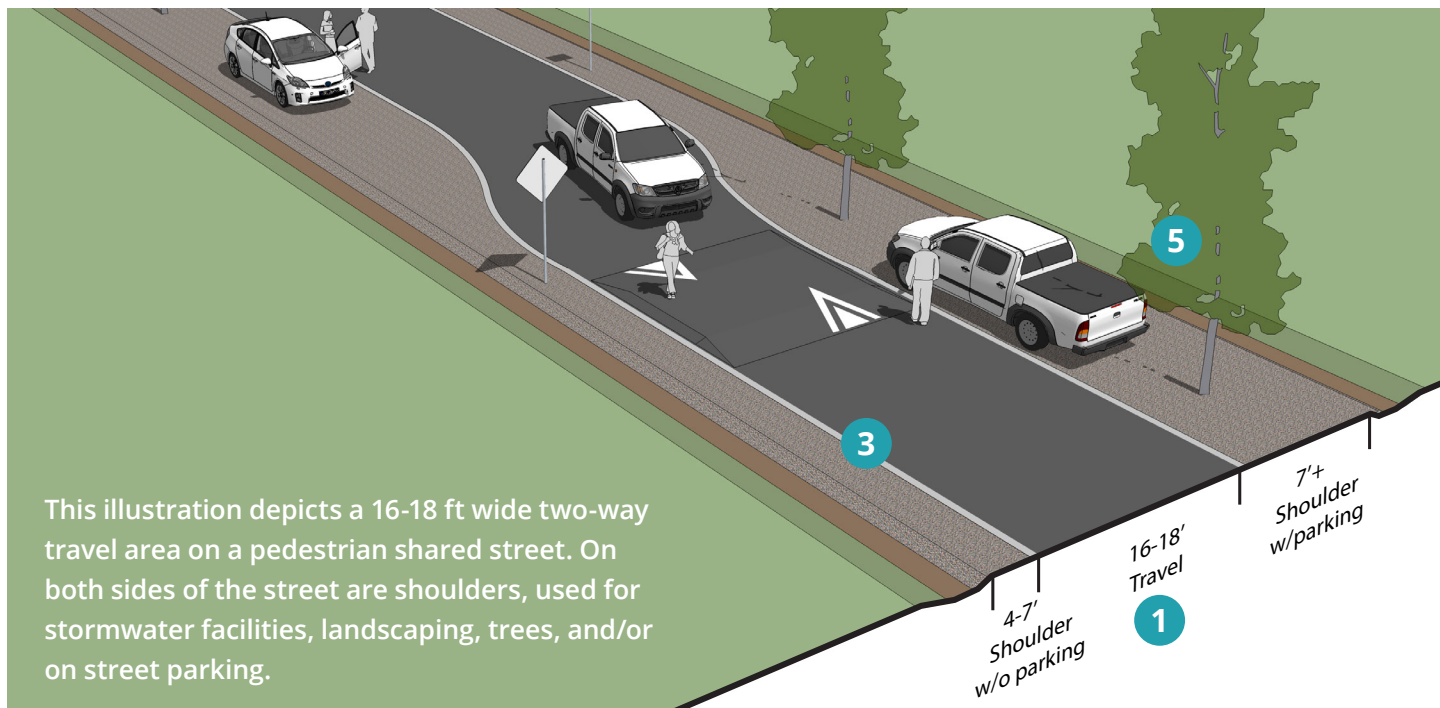


NE Klickitat St Esplanade in NE Portland crosses multiple streets to connect into Irving Park.



Staircase off SW Terwilliger Blvd in Southwest Portland provides a direct connection for pedestrians to reach OHSU. An accessible route is provided on the nearest full street connection.

Pedestrian Shared Street



DESCRIPTION

A Pedestrian Shared Street is designed to serve pedestrians, bicyclists, and motor vehicle traffic on a shared low-speed travel area. On very low-volume and low-speed streets, pedestrians and bicyclists are comfortable using the roadway with the occasional vehicle.

WORKS BEST WHERE

Roadway classification	Local, Residential
Max vehicle volume	500 vehicles per day
Speed limit	15 mph
Safe Routes applicability	Yes
Traffic calming may be required	Yes

CONSIDERATIONS

Pedestrian shared streets should be designed to match the requirements of a “Shared Residential Street” as defined by City Ordinance #185759 and a “Narrow Residential Roadway” as defined by ORS 801.368.

KEY DESIGN ELEMENTS

- 1 Total edge of pavement to edge of pavement width may vary from 16 ft to 18 ft to require slow speed user interaction.
- 2 These streets should meet or exceed lighting requirements.
- 3 Markings and signs should encourage appropriate slow-speed travel behavior
 - The street should be designed for 15 MPH travel, speed limit signs may be posted.
 - A PBOT “Shared Street” signs should be used at the beginning and end of the pedestrian shared street segment.
 - No centerline marking should be used on pedestrian shared streets.
- 4 Traffic calming tools such as speed humps or horizontal shifts in the roadway may be necessary to create slow operating conditions.

OPTIONAL DESIGN ELEMENTS

- 5 Stormwater, landscaping and trees may be planted within the shoulder area at regular intervals to visually and physically narrow the corridor, add to the aesthetic environment, and encourage slow speeds.

PRECEDENT IMAGES



SW Brugger St is a de facto pedestrian shared street in Southwest Portland. While this street may meet performance and design guidelines, an engineering analysis and revisions to markings, signs and design would be necessary to formalize this connection.

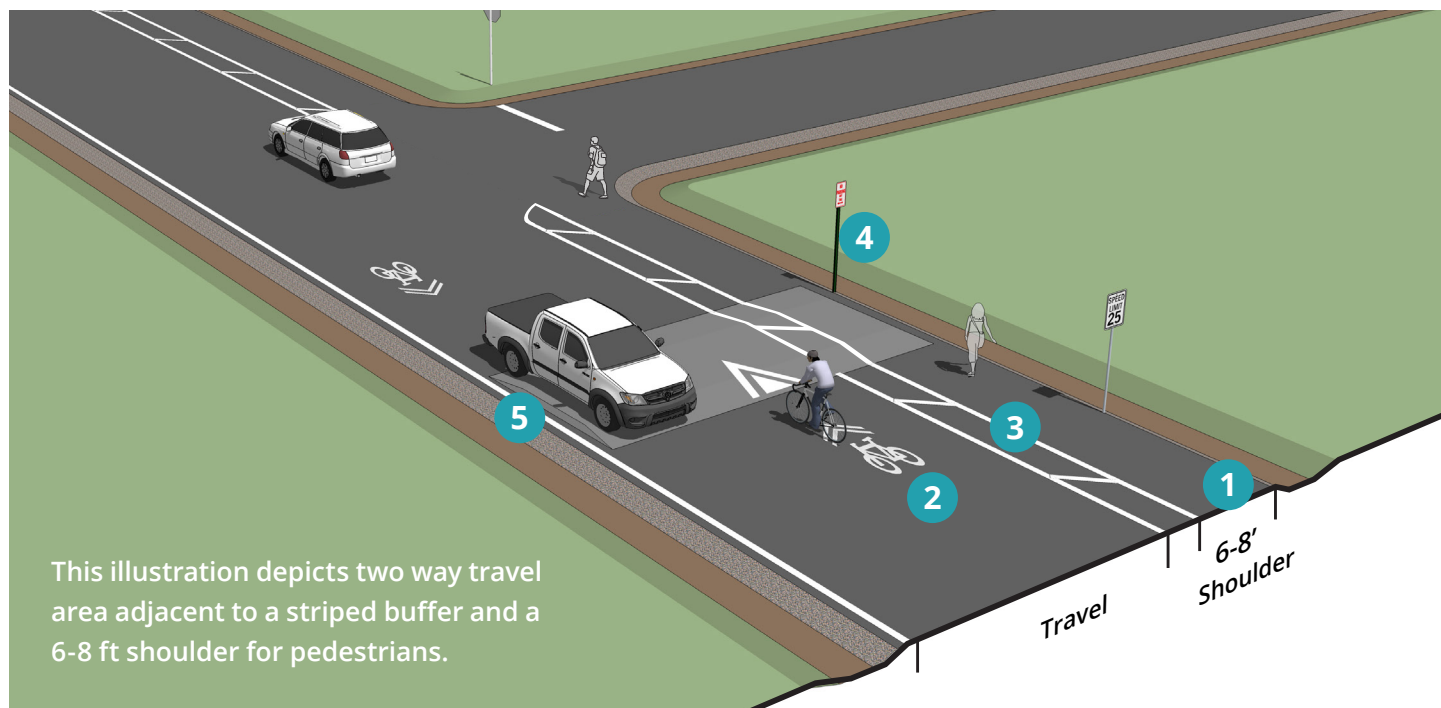


SE Mill St is a de facto pedestrian shared street. While this street may meet performance and design guidelines, an engineering analysis and revisions to markings, signs and design would be necessary to formalize this connection.



SW 19th Ave is a new pedestrian shared street in Southwest Portland. This street is designed and signed for 15 mph travel, and includes PBOT "Shared Street" signs.

Slow Safer Shoulder



DESCRIPTION

A Slow Safer Shoulder is a paved roadway shoulder delineated with lane striping, intended to provide interim or temporary pedestrian accommodation separated from moving traffic. This treatment is appropriate on local streets and works best paired with traffic calming to create slow operating conditions.

WORKS BEST WHERE

Roadway classification	Local
Max vehicle volume	3000 vehicles per day
Max posted speed	20 mph
Safe Routes applicability	500 vehicles per day
Traffic calming may be required	Yes

CONSIDERATIONS

Where speeds and volumes are high, or on collector and arterial streets, physical separation is desirable to maintain comfort and safety. Refer to Protected Safer Shoulder in this guide.

This facility is generally not appropriate in areas classified as Pedestrian Districts.

KEY DESIGN ELEMENTS

- 1 Safer Shoulders should be designed to support side-by-side walking within the lane. Because of the lack of physical separation, additional width beyond this should be included for comfort where possible.
 - 8 ft width preferred;
 - 6 ft width minimum.
- 2 Bicyclists are expected to travel in the roadway with motor vehicles. Shared lane markings are used on streets when developed as neighborhood greenways.
- 3 Mark a double white line between travel lanes and shoulder walkway. Where extra space is available, mark as buffer separation.
- 4 Prohibit vehicles from parking on safer shoulders through signs and markings.

OPTIONAL DESIGN ELEMENTS

- 5 Provide traffic calming elements when speed and volume thresholds are not met e.g. posted speed reductions, removing center lines, narrowing travel lanes.
- 6 Tactile warning surface indicators may be used to indicate intersection crossing areas.

PRECEDENT IMAGES

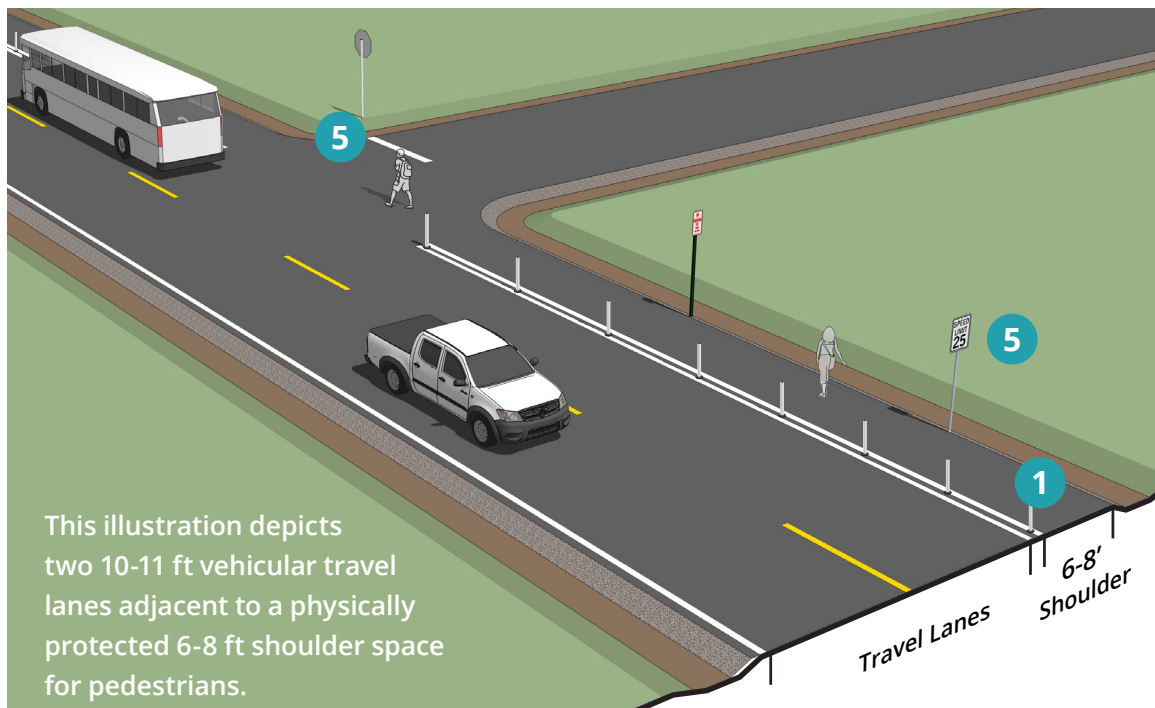


SE Maplewood Rd in Southwest Portland combines a slow safer shoulder with a neighborhood greenway route. Bicyclists and motor vehicles operate in a shared travel area. Pedestrians travel on the striped shoulder.



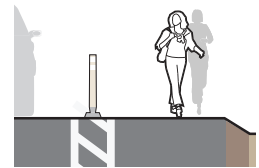
SE Maplewood Rd in Detroit, OR uses a pedestrian shoulder as an alternative to sidewalks.

Protected Safer Shoulders

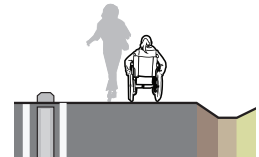


2 SEPARATION OPTIONS

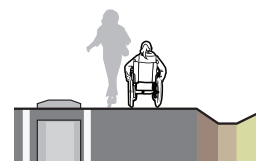
DELINEATOR POSTS



WHEEL STOPS



TRAFFIC SEPARATOR



DESCRIPTION

Protected Safer Shoulders are paved roadway shoulders, delineated with lane striping and separated from moving traffic with a physical barrier, similar to protected bike lanes.

WORKS BEST WHERE

Roadway classification	Collector, Arterial
Max vehicle volume	N/A
Max posted speed	35 mph
Safe Routes applicability	with posted speed of 20 mph
Traffic calming may be required	No

CONSIDERATIONS

On busy streets with no bicycle facilities, bicyclists are likely to use the protected safer shoulder space. Where this is likely or expected, provide additional width to minimize conflicts. Refer to the Portland Protected Bike Lane Planning and Design Guide for information on preferred dimensions.

This facility is generally not appropriate in areas classified as Pedestrian Districts.

KEY DESIGN ELEMENTS

- 1 Safer Shoulders should be designed to support side-by-side walking within the lane.
 - 8 ft width preferred;
 - 6 ft width minimum.
- 2 A wide variety of separation methods exist, depending on right-of-way width, drainage, and cost.
 - Physical elements such as parking wheel stops, delineator posts, or traffic separators may establish physical separation within a space of 1-3 ft.
- 3 Mark a double white line between travel lanes and the safer shoulder. Where extra space is available, mark as buffer separation.
- 4 Prohibit vehicles from parking on safer shoulders through signs and markings.

OPTIONAL DESIGN ELEMENTS

- 5 Tactile warning surface indicators may be used to indicate intersection crossing areas.

PRECEDENT IMAGES



A protected safer shoulder walkway on SW Vermont St just outside of the city of Portland boundaries.

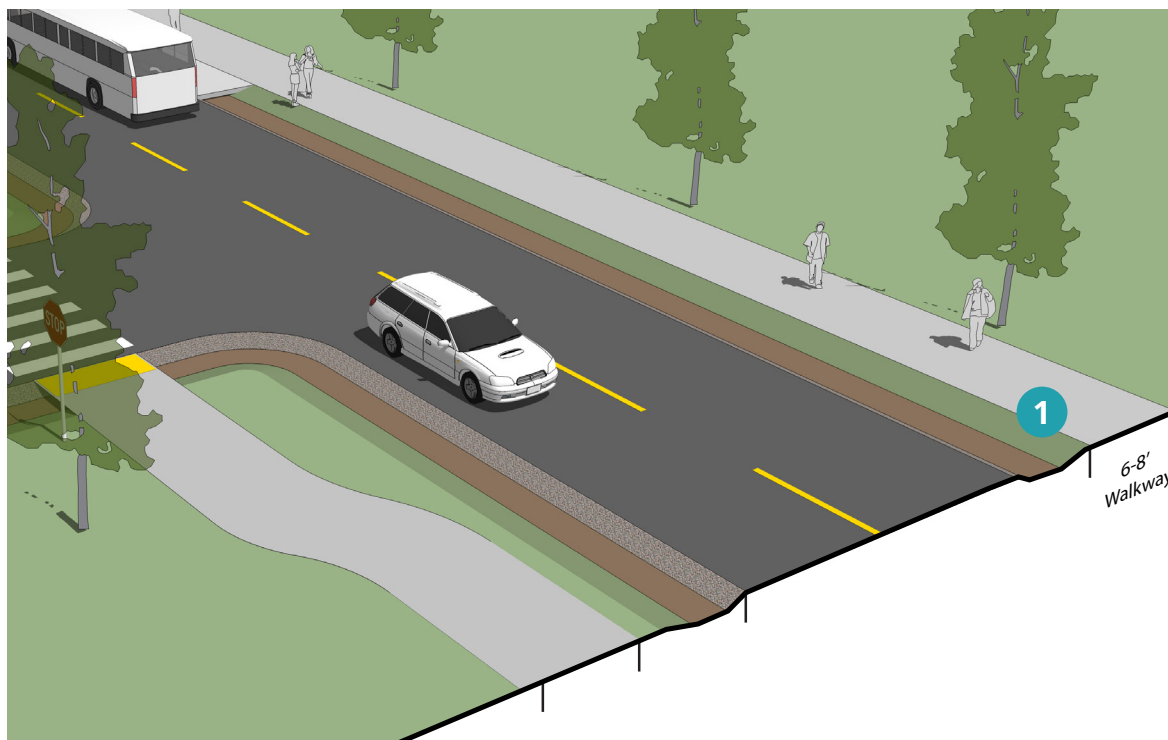


Curb protected walkway in Seattle, WA



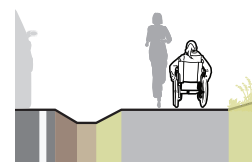
Curb protected walkway in Seattle, WA

Separated Walkway

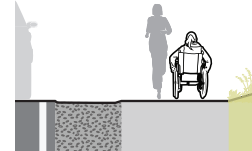


3 BUFFER OPTIONS

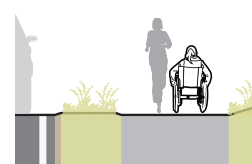
SWALE OR DITCH



GRAVEL SHOULDER



LANDSCAPING



DESCRIPTION

On streets without curbs, a Separated Walkway provides an exclusive pedestrian walkway separated from the roadway with an unpaved area. The separation area may integrate a swale, ditch or landscaping.

WORKS BEST WHERE

Roadway classification	Local, Collector, Arterial
Max vehicle volume	N/A
Max posted speed	N/A
Safe Routes applicability	Yes
Traffic calming may be required	Not required

CONSIDERATIONS

(NOTE: NO CONSIDERATION CONTENT)

KEY DESIGN ELEMENTS

- 1 The Separated Walkway should be designed to support side-by-side walking:
 - 8 ft width preferred;
 - 6 ft width minimum.
- 2 When intended for use by bicyclists, increased width is required
 - User separation is preferred over shared use.
 - Long distance shared use paths should meet national and local bikeway design guidelines.
- 3 Unpaved separation, such as a gravel shoulder, vegetated shoulder, or stormwater facilities may provide separation within 4 to 7 ft or greater.

OPTIONAL DESIGN ELEMENTS

- 4 On-street parking may be provided in the roadway, adjacent to, or integrated with the physical separation.

PRECEDENT IMAGES



NE 72nd Ave in Northeast Portland provides a separated walkway with integrated landscaping, stormwater facilities and on-street parking.



McVey Ave in Lake Oswego, OR. A landscape separated walkway.



SW Taylors Ferry Rd in Southwest Portland. This historic example doesn't meet minimum widths, but provides an unpaved separation from the roadway.

PAGE INTENTIONALLY LEFT BLANK.