



PEDESTRIAN & BICYCLIST
FOCUSED APPROACH TO SAFETY

Improving Safety for Pedestrians and Bicyclists Accessing Transit Guide

Monday October 24, 2022



U.S. Department of Transportation
Federal Highway Administration

ZERO IS OUR GOAL
A SAFE SYSTEM IS HOW WE GET THERE



Disclaimer

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Webinar Logistics

- Please post questions at any time
- We will be saving time at the end of the session for questions and discussion
- Webinar slides and recording will be posted at https://www.pedbikeinfo.org/webinars/webinar_details.cfm?id=120

Continuing Education Credits

- Webinar approved for 1.5 CM credits through AICP
- Brief questionnaire following webinar for sharing feedback.
- Information about webinar archive materials, recording and certificates of attendance will be sent in a follow-up email this afternoon.

Agenda

- Introduction and Welcome
- Overview of new guide for *Improving Safety for Pedestrians and Bicyclists Accessing Transit* (Tamara Redmon and Elissa Goughnour)
- Agency Case Studies:
 - Oregon Department of Transportation (Glen Bolen)
 - City of Pittsburgh (Darcy Cleaver, Craig Toocheck, Paige Anderson)
- Discussion

Webinar Objectives

- Share details about new guide for *Improving Safety for Pedestrians and Bicyclists Accessing Transit*.
- Understand safety concerns and opportunities for bicycling and walking to transit.
- Learn from transportation agencies about their efforts to improve safety for pedestrians and bicyclists accessing transit.

Panelist Introductions

- Tamara Redmon, FHWA
- Elissa Goughnour, VHB
- Glen Bolen, Oregon DOT
- Darcy Cleaver, Pittsburgh Regional Transit
- Craig Toocheck, Pittsburgh Regional Transit
- Paige Anderson, City of Pittsburgh



Questions and Discussion

Thanks for joining!

- Be on the lookout for an email with:
 - An evaluation survey
 - Meeting materials (with contact information)



Improving Safety for Pedestrians and Bicyclists Accessing Transit

FHWA-SA-21-130

Tamara Redmon, FHWA
Elissa Goughnour, VHB



U.S. Department of Transportation
Federal Highway Administration



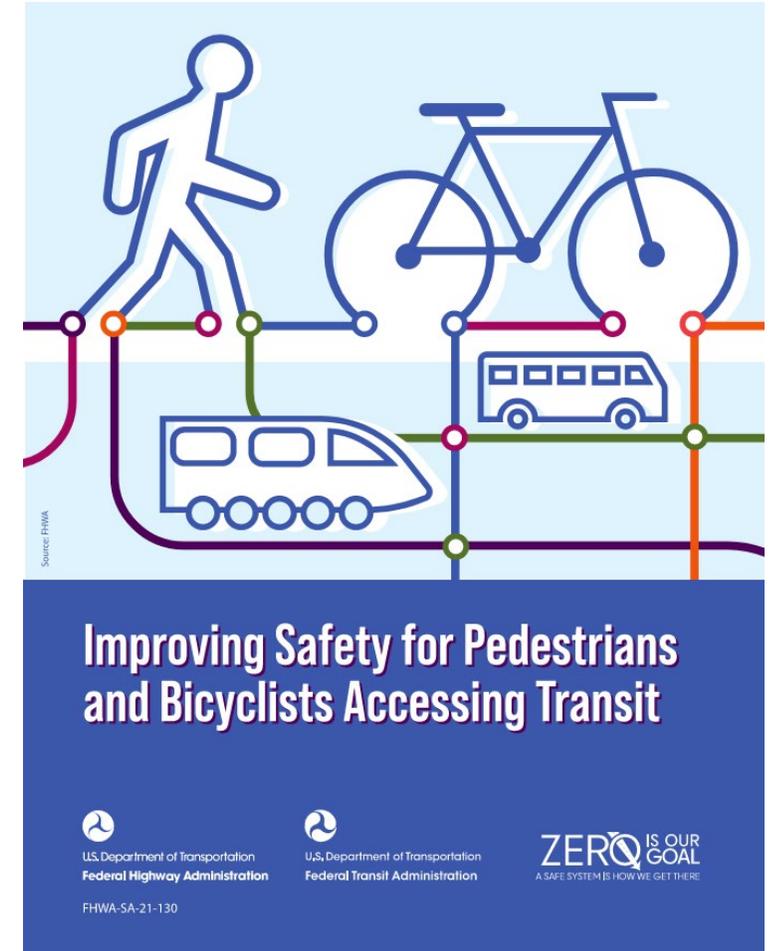
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This Guide...

- Is intended for transit agencies, State and local roadway owners, and regional planning organizations.
- Addresses the safety of a variety of vulnerable road users.
- Highlights the many engineering and operational efforts agencies can take to improve safety for pedestrians and bicyclists while accessing transit.



Source: FHWA/FTA



[https://safety.fhwa.dot.gov/ped_bike/ped_transit/fhwasa21130 PedBike Access to transit.pdf](https://safety.fhwa.dot.gov/ped_bike/ped_transit/fhwasa21130_PedBike_Access_to_transit.pdf)



Why was an update necessary?

- Focus: new transit technologies and implementation, innovative analysis methods, and detail interagency coordination strategies.
- Updated guide to include:
 - Bicycle considerations on par with pedestrian components
 - New design considerations such as floating bus stops
 - Micromobility integration
 - Right-of-way planning
 - Research findings
 - Implementation lessons learned
 - Case studies that have occurred since original publication date (2008).



Working Group Members

- Virginia Department of Transportation (VDOT), Highway Safety Planning Manager
- Southwest Ohio Regional Transit Authority (SORTA)/Go Metro, Director of Transit Development
- New Jersey Transit, Senior Facilities Planner
- LYNX (Central Florida Regional Transportation Authority), Senior Project Manager
- Washington Metropolitan Area Transit Authority (WMATA), Senior Planner
- Pittsburgh Regional Transit (PRT), Senior Planner
- Arlington County DOT, Vision Zero Coordinator
- Easterseals Project Action/National Aging & Disability Transportation Center, Communications Manager
- San Diego Metropolitan Transit System (MTS), Manager of Service Quality - Rail
- Florida Department of Transportation (FDOT), Assistant Director of Strategic Development
- Delaware Valley Regional Planning Commission (DVRPC), Manager, Office of Transit, Bicycle, and Pedestrian Planning
- Los Angeles County Metropolitan Transportation Authority, Senior Director, Countywide Planning & Development
- Indianapolis Public Transportation Corporation (IndyGo), Director of Service Planning



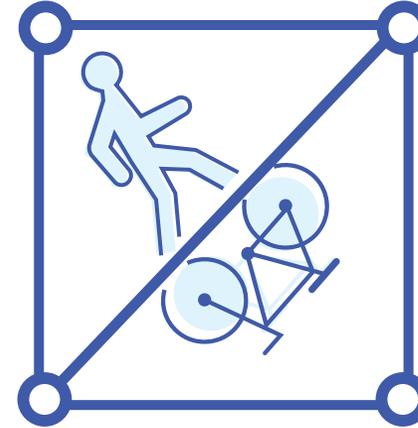
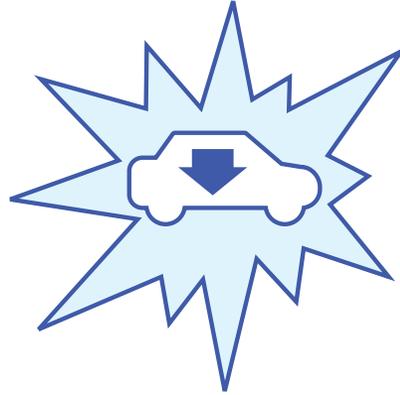
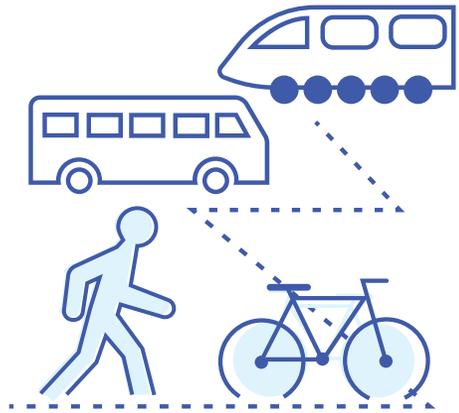
What's in the new guide?



Purpose of the Guide

Transit provides mobility options to people of all backgrounds, reduces harmful emissions, and supports equitable economic development. The physical safety of transit passengers while using and accessing transit facilities is crucial to the success of a transit system.

Core Principles for Pedestrian and Bicyclist Safe Access to Transit



The physical safety of transit passengers while using and accessing transit facilities is crucial to the success of the transit system.

Transit use can decrease an area's overall motor vehicle crashes.

Transit stops are pedestrian and bicyclist generators.

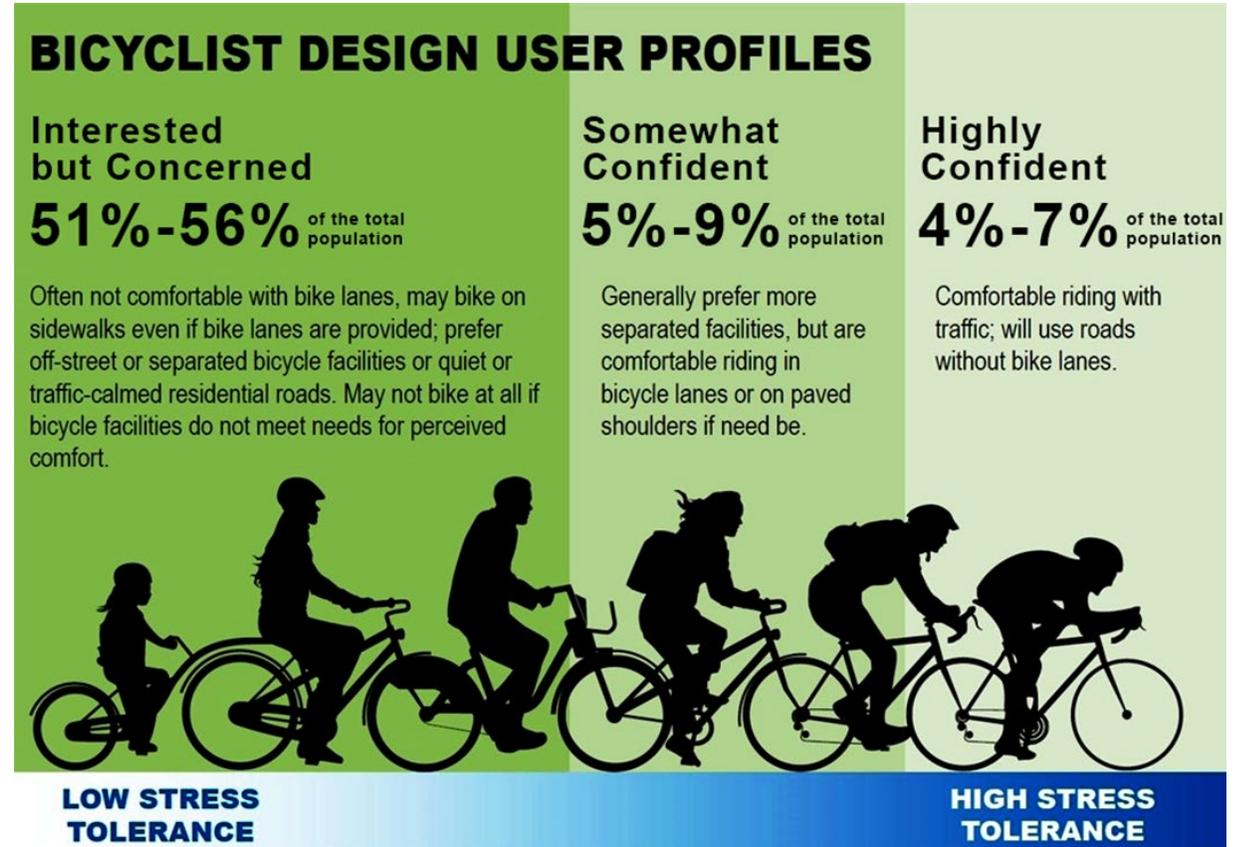
Pedestrians and bicycling routes to access transit should reflect a connected network of roadway, sidewalk, and bicyclist facilities.

Transit stops can enhance the safety of riders, but only if they are usable and welcoming to everyone.



Background

- Who Uses Transit?
- Distance Pedestrians and Bicyclists Are Willing to Travel to Transit
- Pedestrian and Bicyclist Characteristics and Behavior
 - Age, gender, race, physical ability, etc. all play a role in how infrastructure and transit should be planned and integrated to enhance safety
- Crash Factors for Pedestrians and Bicyclists Accessing Transit

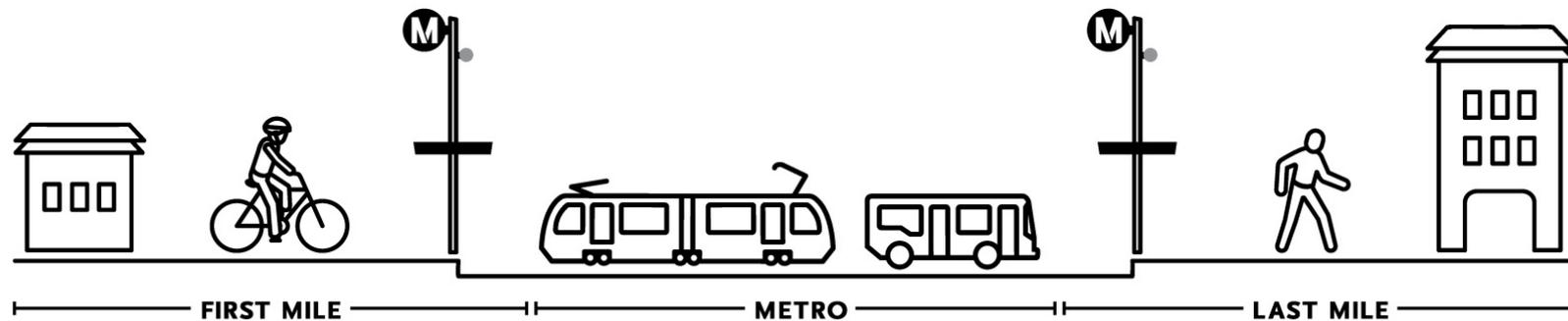


Source: Revisiting the Four Types of Cyclists, Dill & McNeil



Tools for Identifying Pedestrian and Bicyclist Safety Issues

- **Gathering direct feedback** from transit users and providers or other groups.
- **Evaluating Safety and Accessibility with Transit Stop Assessment Tools**
- **Estimating First-Mile/Last-Mile Access** surrounding a transit facility
- **Observing Pedestrian and Bicyclist Behavior**



Source: LA Metro



Approaches to Enhancing Pedestrian and Bicyclist Safety

Several actions transit agencies may employ to enhance traffic safety include (but are not limited to):

- Take internal actions to foster a culture of safety.
- Form partnerships with public agencies and public-private organizations.
- Organize transit operator training programs.
- Re-evaluate internal agency documentation and policies.
- Incorporate safety features into design.
- Make enhancements to the pedestrian and bicyclist design standards.
- Provide transit agency representation on metropolitan and regional planning organization decision-making boards and committees

Implement High-Quality and Reliable Transit



Provide Frequent Service



Improve Access and Connections to Transit



Build a Sense of Place



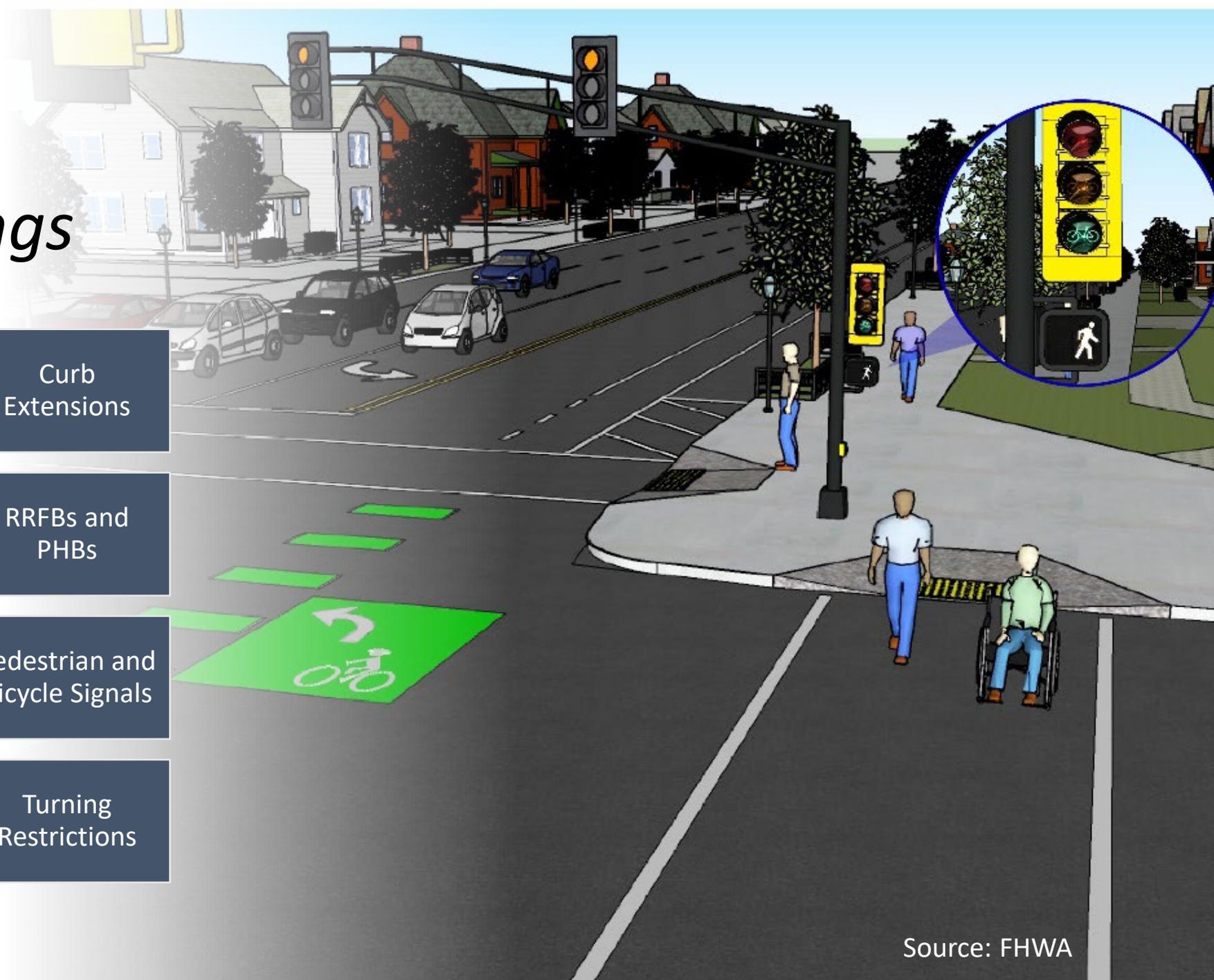
Make the Most of our Investments



Source: Denver's Big Moves and Strategies, City of Denver

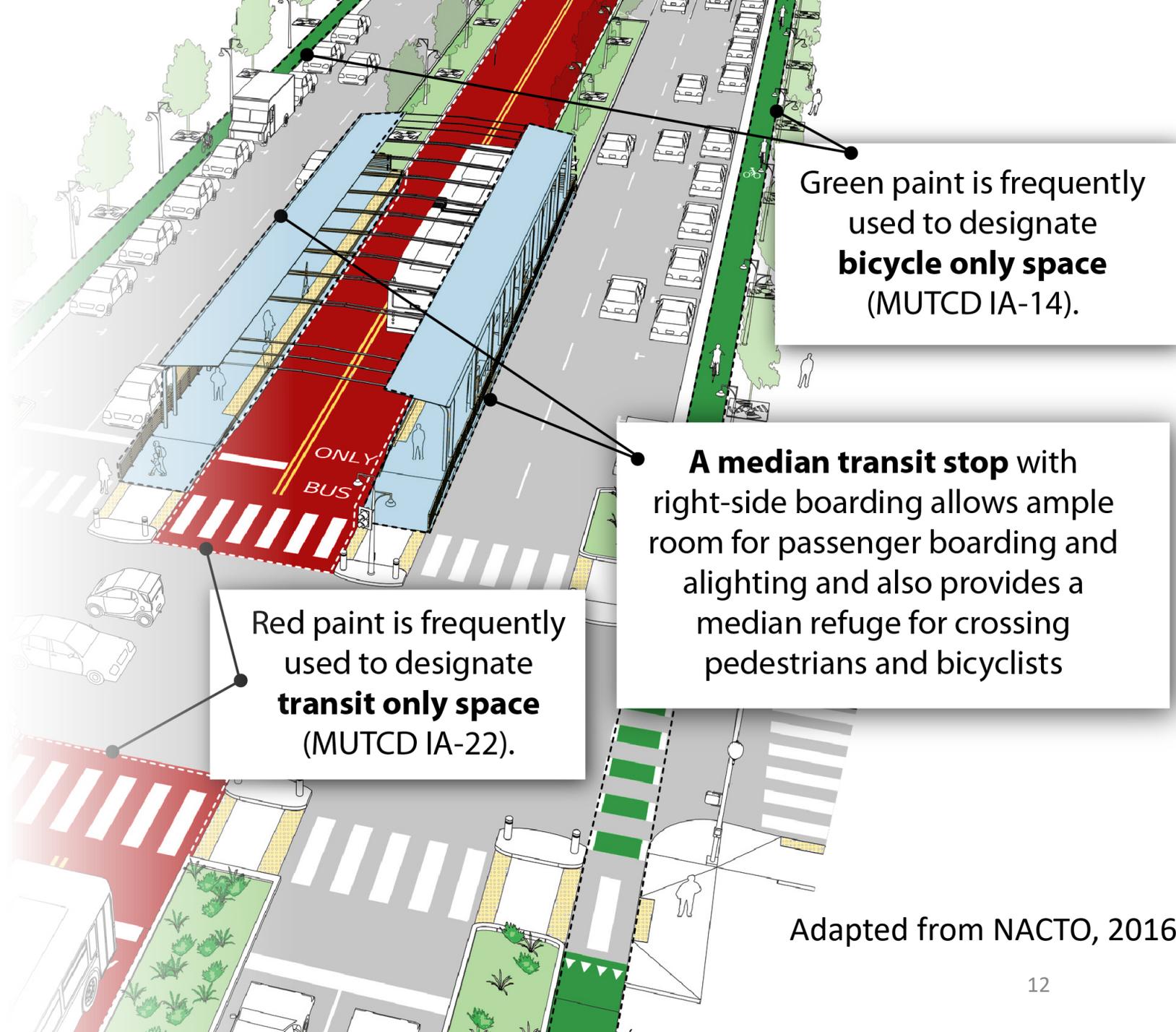
Transit Access Design – Crossings

Marked Crossings	Refuge Islands	Curb Extensions
Reduced Corner Radii	Raised Crossings	RRFBs and PHBs
Modifying Motor Vehicle Travel Lanes	Regulatory and Warning Signs	Pedestrian and Bicycle Signals
Two-Stage Bicycle Turn Box	LPIs and LBIs	Turning Restrictions



Transit Stop Design

- Curbside Stops
- Curbside Pullouts
- Bus Bulb Outs
- Floating Transit Stops
- Median Stop
- Lighting
- Transit Stop Amenities
- Mobility Hubs and Micromobility



Adapted from NACTO, 2016

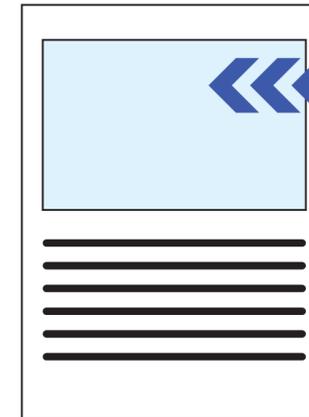


Examples and Case Studies

- Many of the examples and case studies used throughout the guide have an element of equity
- Some examples include:
 - Racial Equity Policies
 - Equitable Transit-Oriented Development Plan
 - Designing transit stops that are accessible and equitable for all users

Fairfax County, Virginia Social and Racial Equity Policy

Fairfax County, Virginia, adopted a social and racial equity policy, titled “One Fairfax” (Fairfax County, 2017). The policy covers multiple safety sectors and has one goal dedicated to transportation defined as “a multimodal transportation system that supports the economic growth, health, congestion mitigation, and prosperity goals of Fairfax County and provides accessible mobility solutions that are based on the principles associated with sustainability, diversity, and community health (Fairfax County, 2017).” The County also included goals for better transportation in the County’s strategic plan and mitigation strategies to improve the transportation system and highlight



**CALL OUT BOXES
THROUGHOUT THE GUIDE**
highlight noteworthy
real-world applications
from cities, States, and
transit providers. These
examples help readers better
visualize effective safety
practices in transit access.

A blue line-art illustration of a pedestrian, positioned on the left side of the slide. The figure is shown in a walking or running pose, facing right. It has a simple, stylized body with a circular head. A horizontal line with green, blue, and orange segments runs across the middle of the slide, passing behind the pedestrian's head.

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JULY
2020



TriMet

Pedestrian Plan

Plan Purpose

The TriMet Pedestrian Plan identifies priorities for improving walking and rolling access to transit across the TriMet service area. The Plan's recommendations:

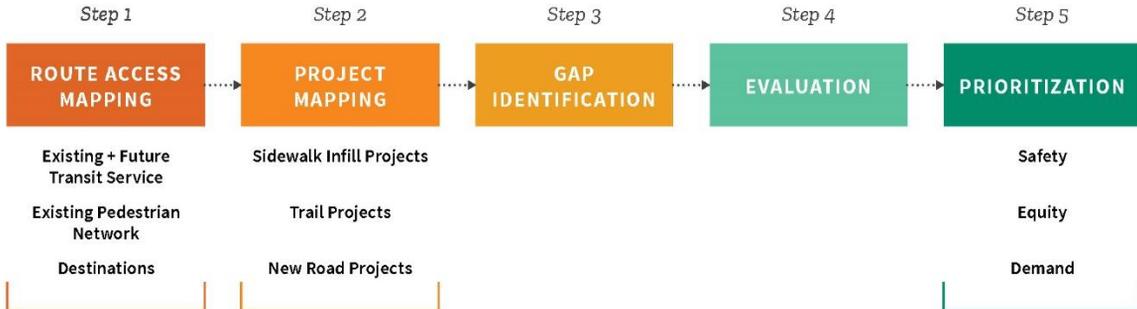
- **Provide a common resource for TriMet and agency partners,**
- **Assist in prioritizing local roadway jurisdiction investments in pedestrian infrastructure,**
- **Support funding requests and program development, and**
- **Establish a dynamic tool for agency efforts and future collaboration.**

Plan Process

Engagement



Analysis



Plan Uses

If you are...

TRIMET


**COUNTY +
 LOCAL AGENCIES**


**REGIONAL
 PARTNERS**


**ORGANIZATIONS +
 COMMUNITY MEMBERS**

Working on...



Transportation Plans



Project Development
 and Implementation



Grant Applications



Policy and Program
 Development



Community
 Engagement

Please see...

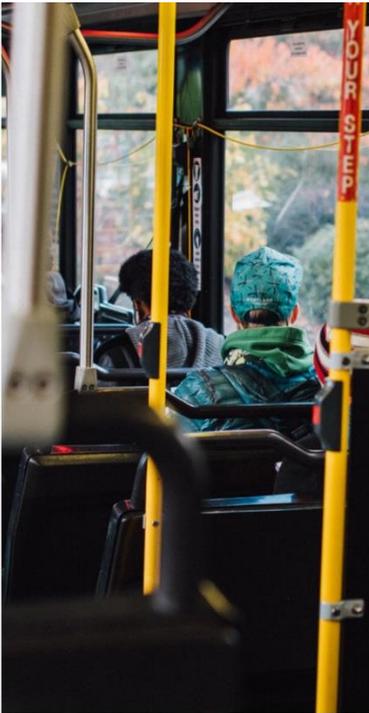
[The Prioritization Approach](#)
 PG. 47

[The Project Prioritization Maps](#)
 PG. 54

[The Project List and Transit
 Stop Prioritization](#)
 APPENDIX E + APPENDIX F

[The Strategies and Actions](#)
 PG. 73

Stakeholder Forum Participant Affiliations



Source: TriMet

[Oregon Department of Transportation \(ODOT\)](#)

[Metro](#)

[Clackamas County](#)

[Multnomah County](#)

[Washington County](#)

[City of Portland](#)

[City of Tigard](#)

[City of Gresham](#)

[City of Beaverton](#)

[City of Milwaukie](#)

[Oregon City](#)

[Oregon Department of Land Conservation and Development](#)

[AARP](#)

[Latino Network](#)

[Street Trust](#)

[Oregon Walks](#)

[Immigrant and Refugee Community Organization \(IRCO\)](#)

[Committee on Accessible Transportation](#)

[TriMet Transit Equity Advisory Committee](#)

[Safe Routes Partnership](#)

[Providence Health & Services](#)

[Portland Community College](#)

[Adidas](#)

[Daimler](#)

Survey

Figure 2 Modes Used to Access Transit

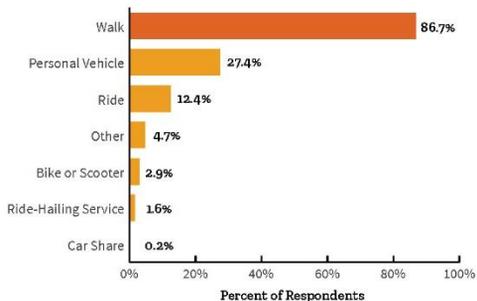


Figure 3 Frequency of Walking to Access Transit

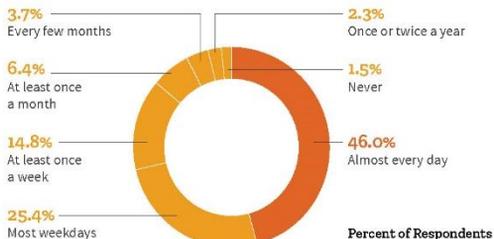


Figure 4 Common Issues Faced when Accessing Transit

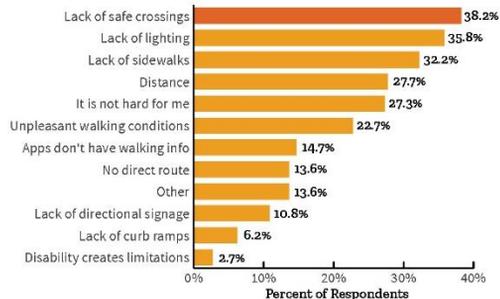
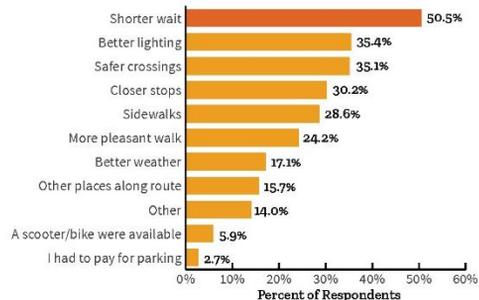


Figure 5 What Would Prompt More Frequent Walks to Transit



Online Open House

The screenshot displays the TRI MET online open house interface. At the top, the navigation bar includes links for Home, Proposed Pedestrian Projects, **Prioritizing Pedestrian Needs**, Barriers, and What's Next. The main content area is split into a control panel on the left and a heatmap map on the right.

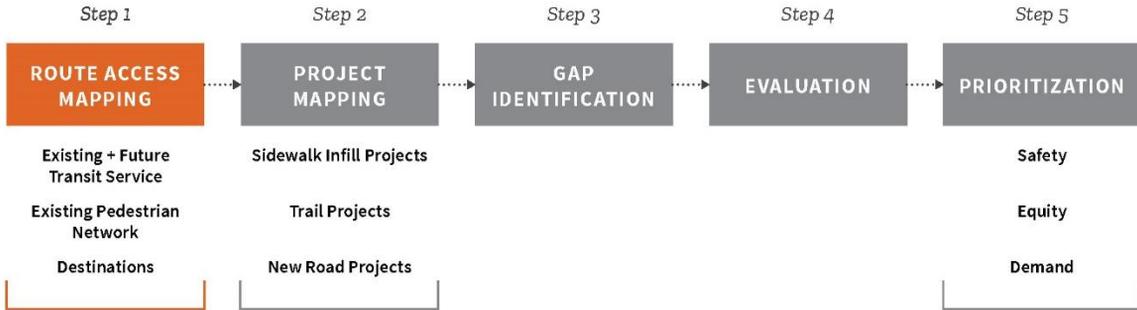
Control Panel:

- What matters to you?**

This map shows you which areas emerge as pedestrian priority areas when all three guiding principles - safety, equity and demand - are weighted equally. You can adjust the sliders to see how changing the importance of these principles affects which areas are prioritized. You can then submit your preferred weighting to us by hitting the "Submit" button.
- Priority:** A color scale legend ranging from Low (light green) to High (dark purple).
- Equity:** A slider set to "Very Important".
- Safety:** A slider set to "Important".
- Demand:** A slider set to "Somewhat Important".
- In which community do you live?** A dropdown menu with "Select" as the current option.
- In which community do you work or go to school?** A dropdown menu with "Select" as the current option.
- Submit** and **Cancel** buttons.

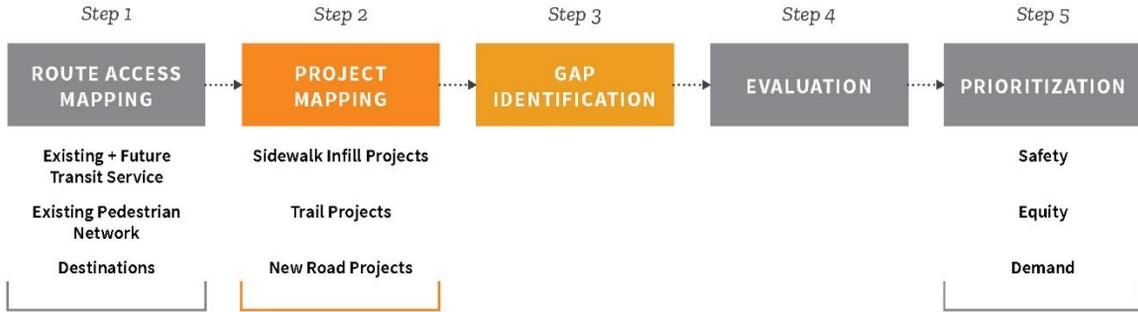
Map: A heatmap overlay on a street grid, where colors indicate priority levels. Darker purple areas indicate higher priority, while lighter green areas indicate lower priority. The map shows a dense network of streets with varying levels of priority across the city.

Analysis – Step 1



CATEGORY	INPUTS		SOURCE
Existing and Future Transit Service	Existing: •MAX Lines •WES •Streetcar •Bus lines (frequent, standard, time-specific service)	Planned: •MAX Red Line extension •SW Corridor Light Rail •Division Transit BRT •Bus lines (frequent, standard service)	TriMet
Existing Pedestrian Network	Regionwide existing sidewalk and pedestrian trail/pathway inventory		OpenStreetMap
Destination	Top Attractors Services Major Employers Institutes of Higher Education		TriMet

Analysis – Steps 2 and 3



Project Mapping

- Nearly 2,000 projects submitted by jurisdictions and partners from existing plans

Gap Identification

- 758 additional gaps in the pedestrian network identified by the project team

PROJECTS

TRIMET SERVICE AREA

TRIMET PEDESTRIAN PLAN

PREVIOUSLY IDENTIFIED PROJECTS

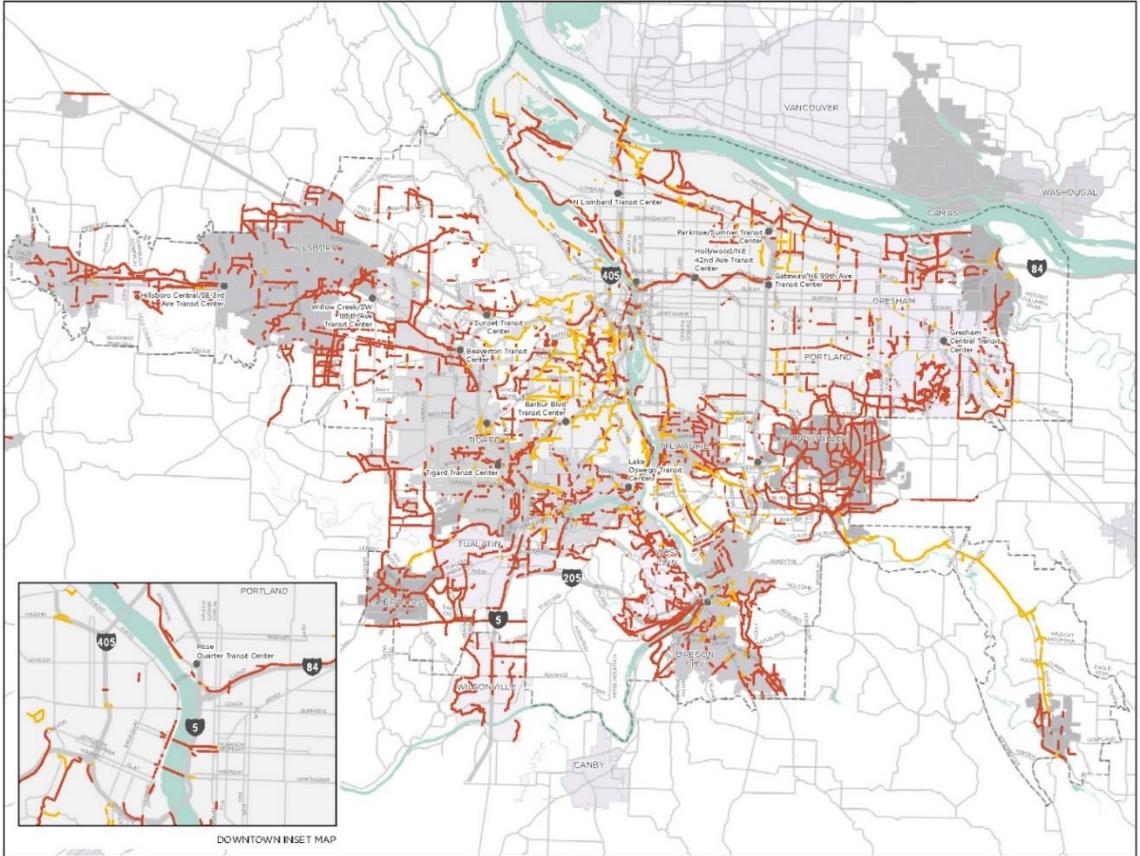
— Sidewalk infill, new roadways and new trails identified in existing plans

IDENTIFIED GAPS

— Sidewalk gaps identified through the Trimet Pedestrian Plan

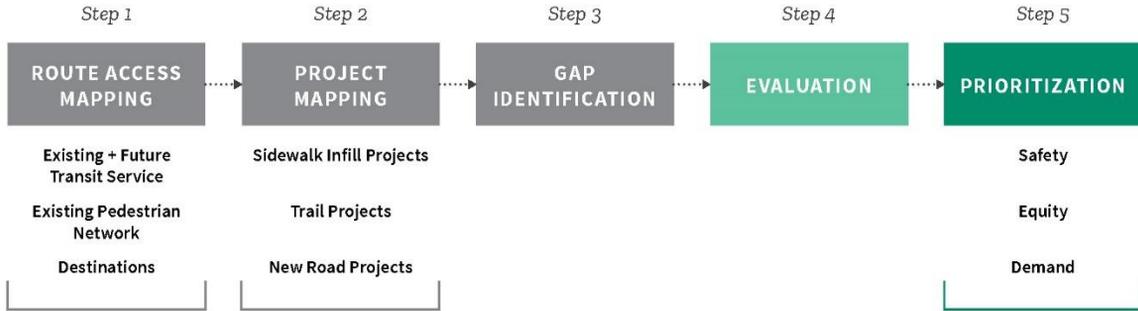
FEATURES AND BOUNDARIES

● Transit Centers
 - - - - - Trimet Boundary
 ■ City Boundary (Various Shading)



DOWNTOWN INSET MAP

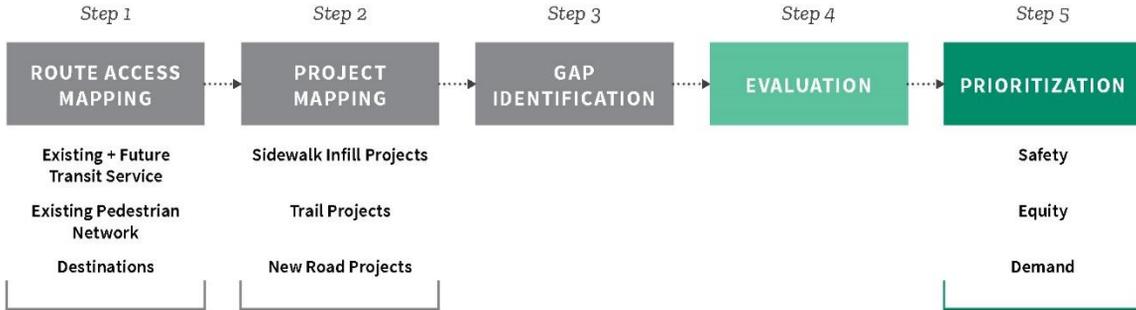
Analysis – Steps 4 and 5



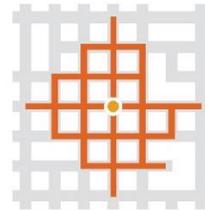
Project Evaluation Includes:

- **Number of Stops Served**
- **Number of Regional Destinations Served**
- **Walkshed Expansion**
- **New Destinations Served**
- **Crossing Element Included in Project**

Analysis – Steps 4 and 5



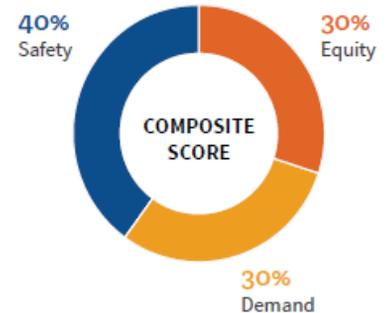
Evaluating *walkshed expansion and new destinations served*, provides an additional measure of project value.



Disconnected vs. Connected Grid

Project Prioritization

PRIORITIZATION CRITERION	COMPONENT	METRIC OR DEFINITION
Safety	Dangerous roads	Metro's High Injury Pedestrian Corridors
	Dangerous locations	Metro's Pedestrian High-Injury Intersections
	Sidewalks	Sidewalk completion within ¼ mile of each stop or station
	Barrier streets	Higher speed/volume/width, defined in Metro Regional Active Transportation Plan
Equity	Low-income populations	Areas with income less than 150% of the federal poverty level
	Communities of color	Percent of people who either identify as Hispanic or do not identify as white
	Seniors and people with disabilities	TriMet LIFT Paratransit origin and destination locations, and ramp deployments (percent of ramp deployment out of total ridership, by transit stop)
Demand	Population density	People per square mile
	Employment density	Jobs per square mile
	Current ridership	On/off by transit stop
	Estimated ridership (for planned future transit lines)	Estimated on/off by transit stop for planned service additions



Products – Interactive Map

Access to Transit: Sidewalk and Trail Gap Projects within Transit Walksheds

This map shows the evaluated and prioritized pedestrian projects. Click on a project to learn more about any project evaluated using the prioritization framework. For more information on the TriMet Pedestrian Plan and the prioritization framework, visit the project's [Virtual Open House](#).

Priority

Low High

Newly identified sidewalk gaps that are low priority

Transit Facilities (zoom to view)

Bus Stops

MAX / WES Stops

Project ID 1475 **Located In** Hillsboro

Primary Description
Construct South Hillsboro/Reedville segment of Tualatin Valley Trail along south side of Portland & Western Railroad corridor.

Secondary Description
Tualatin Valley Trail (Turf-to-Surf Trail)

Project Source
Metro

[Click here for information on additional projects at this location](#)

Priority Tier 2 **Transit Stops** 10

Projects within unincorporated areas

Projects within cities

Project Location

Primary Description ?

Secondary Description ?

Products – Project List

Project ID	Length (feet)	Project Location: Jurisdiction	Project Location: Street	Project Type	Project Source	Primary Description 1	Secondary Description 1
3101	1388	West Linn	10th Street	Trail Project	West Linn	On-street	Salamano Rd/Willamette Falls
3103	134	West Linn	10th Street	Trail Project	West Linn	On-street	Salamano Rd/Willamette Falls
3108	356	West Linn	12th Street	Trail Project	West Linn	On-street	New Secondary N
3111	575	West Linn	12th Street	Trail Project	West Linn	On-street	New Secondary N
3113	450	West Linn	13th Street	Trail Project	West Linn	On-street	New Secondary N
3122	486	Forest Grove	19th Avenue	Sidewalk Infill	Forest Grove	Construct 19th Avenue as 2-lane arterial between C and E	S E Street Pacific Ave Extension
3123	2939	West Linn	19th Street	Trail Project	West Linn	On-street	New Secondary M2
3128	371	West Linn	4th Avenue	Trail Project	West Linn	On-street	New Secondary N
3130	101	West Linn	4th Street	Trail Project	Metro	Provide bike lanes/cycle tracks and sidewalks. This will pro	Willamette Falls Drive Multimodal Improvements - Hwy. 43 tr
3140	283	Oregon City	6th Street	Sidewalk Infill	Oregon City	Singer Creek Connectivity Improvements	WB1
3146	695	Forest Grove	Adair Street	Sidewalk Infill	Forest Grove	complete sidewalk gaps	
3160	282	West Linn	Arbor Court	Trail Project	West Linn	On-street	New Secondary A - Skye Parkway Trail
3161	1990	West Linn	Arbor Drive	Trail Project	West Linn	On-street	New Secondary A - Skye Parkway Trail
3165	300	Lake Oswego	Ash Street	Sidewalk Infill	Lake Oswego	250' long pathway, 1,000' long sidewalk, 5' wide. Section bet	Ash Street Sidewalk and Pathway - Erickson Street to O'Br
3166	669	Lake Oswego	Ash Street	Sidewalk Infill	Lake Oswego	250' long pathway, 1,000' long sidewalk, 5' wide. Section bet	Ash Street Sidewalk and Pathway - Erickson Street to O'Br
3171	1826	Unincorporated Clackamas County	Atwater Road	Sidewalk Infill	Lake Oswego	1,700' long, 6' wide curb tight sidewalks. Atwater needs to b	Atwater Road Sidewalks - Knous Road to Boca Ratan Drive
3172	952	Lake Oswego	B Avenue - Foothills Rd to Foot	New Roadway	Lake Oswego	1,000' long new construction of three blocks of B Avenue, in	B Avenue - Foothills Rd to Foothills Park
3178	240	West Linn	Barlow Street	Trail Project	West Linn	On-street	Neighbor Trail - New Secondary D
3182	527	Cornelius	Baseline Street	Sidewalk Infill	Cornelius	Transportation System Plan Pedestrian Plan pgs 5-3 thru 5-4P15	
3183	1013	Cornelius	Baseline Street	Sidewalk Infill	Cornelius	Transportation System Plan Pedestrian Plan pgs 5-3 thru 5-4P15	
3184	779	Cornelius	Baseline Street	Sidewalk Infill	Cornelius	Transportation System Plan Pedestrian Plan pgs 5-3 thru 5-4P6b	
3185	279	Cornelius	Baseline Street	Sidewalk Infill	Cornelius	Transportation System Plan Pedestrian Plan pgs 5-3 thru 5-4P5	
3192	1820	Gladstone	Beatrice Avenue	Sidewalk Infill	Gladstone	Install sidewalks on the east side Beatrice Ave from Clackar	P16 P17
3214	1043	West Linn	Blankenship Road	Trail Project	West Linn	On-street	Salamano Rd/Willamette Falls
3215	125	West Linn	Blankenship Road	Trail Project	West Linn	On-street	Salamano Rd/Willamette Falls
3216	121	West Linn	Blankenship Road	Trail Project	West Linn	On-street	Salamano Rd/Willamette Falls
3220	363	West Linn	Blankenship Road	Trail Project	West Linn	On-street	Salamano Rd/Willamette Falls
3221	2976	West Linn	Blankenship Road	Trail Project	West Linn	On-street	Salamano Rd/Willamette Falls
3222	748	West Linn	Blankenship Road	Trail Project	Metro	Provide congestion relief, address safety issues, and impro	Outman Road/Blankenship Road Improvements
3226	1819	Lake Oswego	Boca Ratan Drive	Sidewalk Infill	Lake Oswego	1,600' long, 5.5' wide curb-tight sidewalk along the east side	Boca Ratan Pathway
3230	305	Lake Oswego	Boones Ferry Road	Trail Project	Lake Oswego	1000' long, 6' wide separated asphalt pathway. Completes a	Boones Ferry Road - Washington Ct to Existing Sidewalk
3234	240	Lake Oswego	Boones Ferry Road	Trail Project	West Linn	3,500' long, 6' wide asphalt shoulder pathway. Connects two	LO-Tigard/Bridgeport-to-Milwaukie Trail Connection
3235	470	Lake Oswego	Boones Ferry Road	Trail Project	Lake Oswego	3,620' long, 6' wide asphalt shoulder pathway. Connects two	LO-Tigard/Bridgeport-to-Milwaukie Trail Connection
3236	469	Lake Oswego	Boones Ferry Road	Trail Project	Lake Oswego	3,620' long, 6' wide asphalt shoulder pathway. Connects two	LO-Tigard/Bridgeport-to-Milwaukie Trail Connection
3237	169	Lake Oswego	Boones Ferry Road	Trail Project	Lake Oswego	3,500' long, 5' wide asphalt shoulder pathway; include wide	Twin Fir - Upper to Boones Ferry Pathway
3238	2962	Lake Oswego	Boones Ferry Road	Sidewalk Infill	Metro	3,500' long widening includes retaining walls above and bel	Boones Ferry Rd bike lanes
3245	2351	Fairview	Bridge Street	Sidewalk Infill	Fairview	Proposed sidewalks	
3247	2325	Oregon City	Brighton Avenue	Sidewalk Infill	Oregon City	Brighton Avenue-Creed Street Sidewalk Infill	W64
3254	1489	Lake Oswego	Bryant Road	Sidewalk Infill	Lake Oswego	2,500' long, combo of bike lanes (widening), pathways, and	Bryant Road Bike Lanes and Pathway
3256	107	Lake Oswego	Bryant Road	Sidewalk Infill	Lake Oswego	2,500' long, combo of bike lanes (widening), pathways, and	Bryant Road Bike Lanes and Pathway
3257	772	Unincorporated Clackamas County	Bryant Road	Sidewalk Infill	Lake Oswego	14,000' (2.65 mi) long bike lanes, both sides. Widening nec	ing Iron Mountain/Upper Drive Bike Lanes
3259	263	West Linn	Buck Street	Trail Project	West Linn	On-street	Falling St/West A St

Pilot – Crossing Research

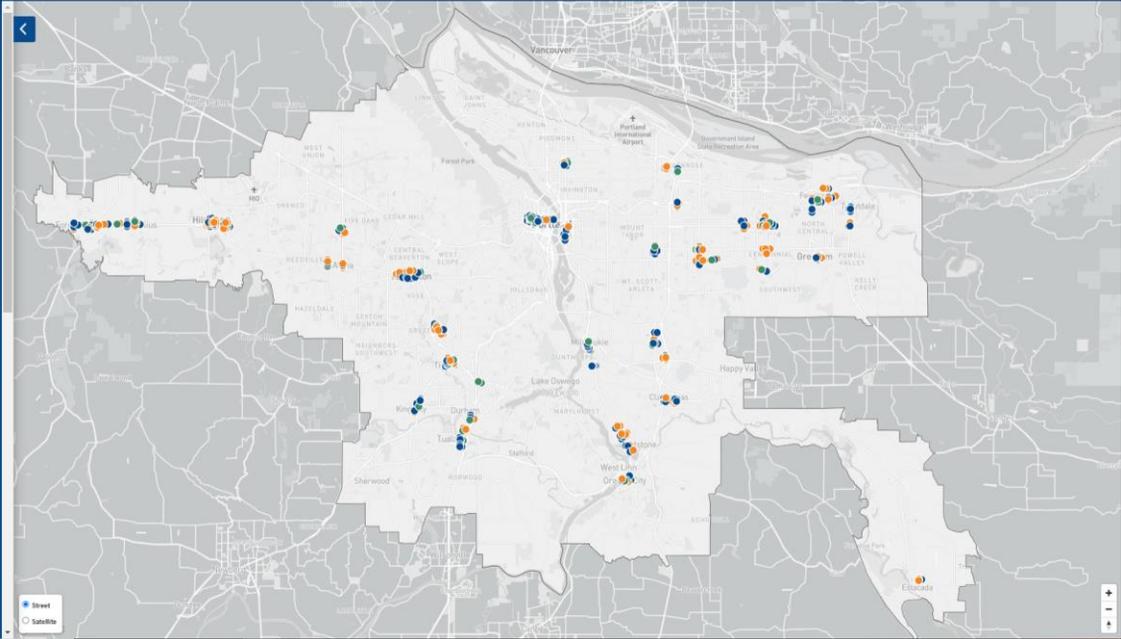
Access to Transit: Pedestrian Crossing Analysis at High Priority Transit Stops

This map shows the results of the TriMet Pedestrian Plan Crossing Analysis. For transit stops and stations that received the highest priority score in the Pedestrian Plan, TriMet evaluated each crossing that falls within an 1/8 of a mile. Crossings occur at each leg of an intersection and also at some midblock locations (not at an intersection).

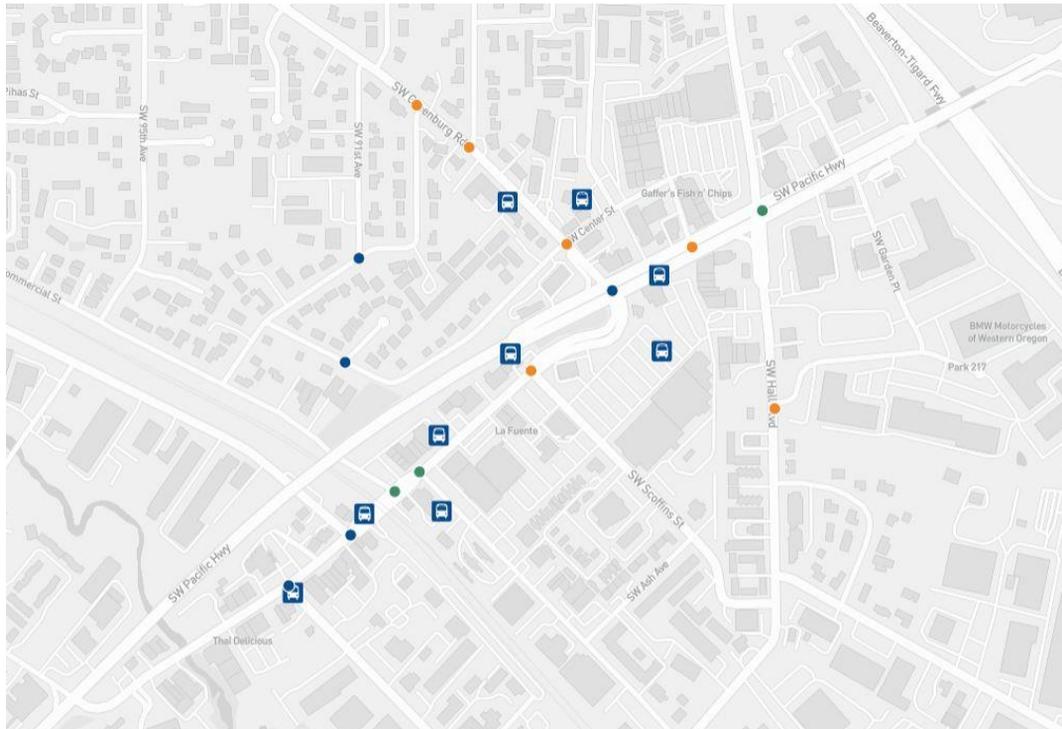
The analysis determined if a crossing is not sufficient, sufficient, or enhanced. Crossings that are marked as sufficient meet the Portland Bureau of Transportation's crosswalk guidelines based on the crosswalk markings, number of lanes, speed limits, and average daily traffic along the roadway. Enhanced crossings must also include truncated domes, curb extensions, high visibility marked crosswalks, curb extensions, lighting, and not include slip lines.

The analysis categorized intersections as not sufficient, sufficient, or convenient. Intersections that are marked sufficient have at least one sufficient crossing in all each potential direction. For example, a standard four-way intersection would need a sufficient crossing in the North-South direction and a sufficient crossing in the East-West direction to be considered sufficient. While those intersections allow pedestrians to cross the street in both directions, they may require out-of-direction travel for people to reach their destination. Intersections with sufficient crossings in all directions have been marked convenient since they will not require any out-of-direction travel.

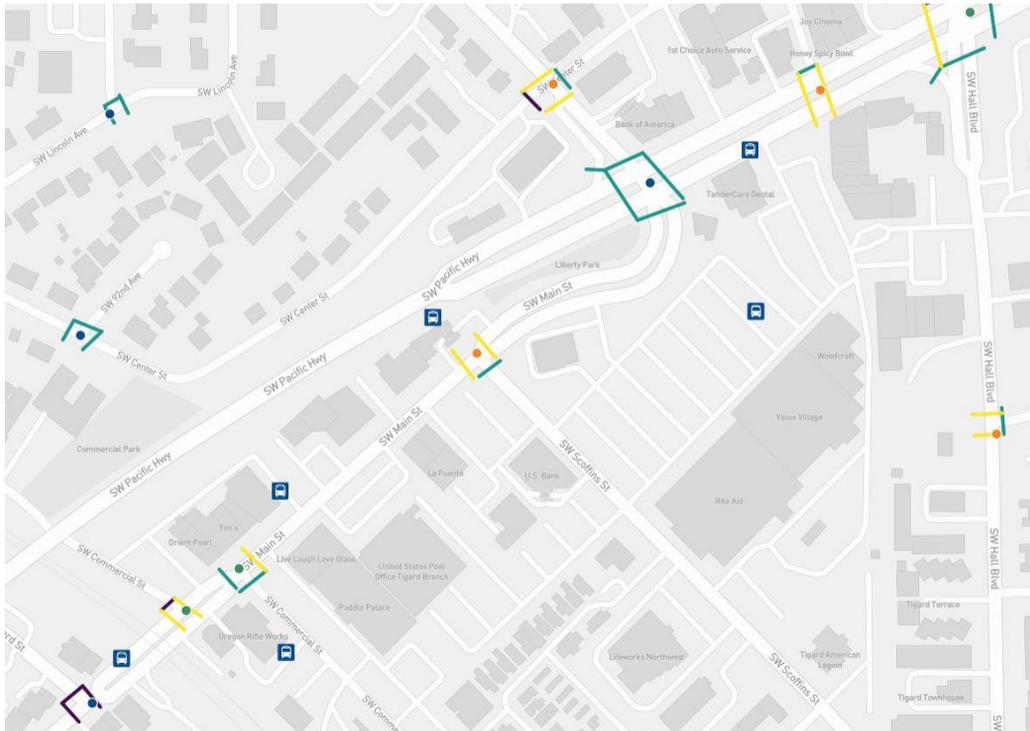
Click on an intersection or crossing leg to see the results of the analysis and an aerial image of the crossing location. Click on the image to see an enlarged view.



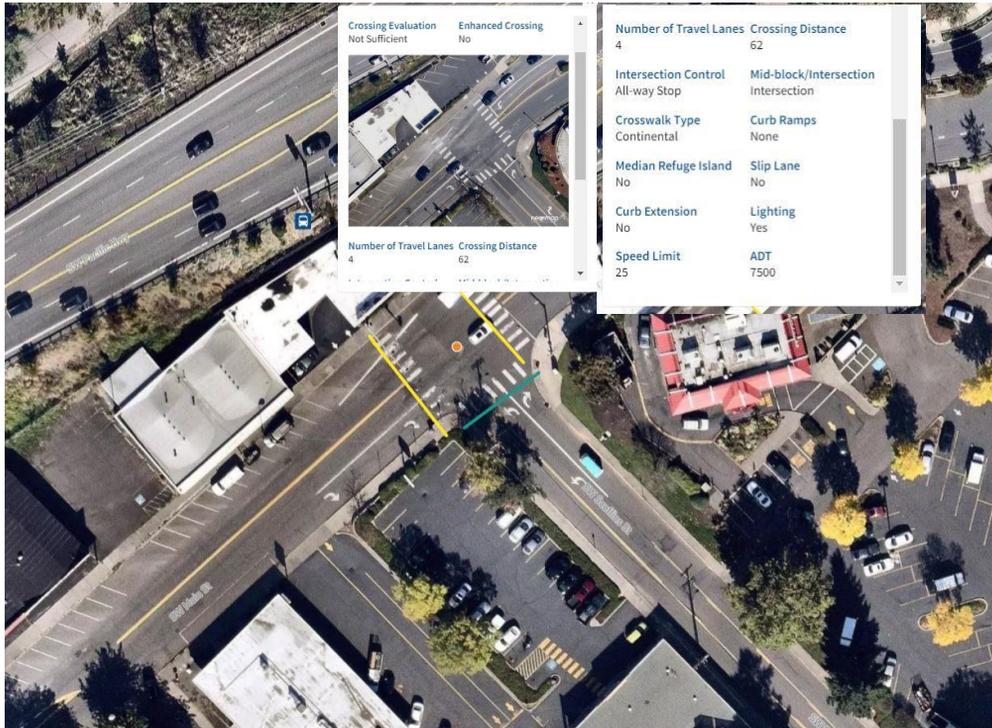
Pilot – Crossing Research



Pilot – Crossing Research



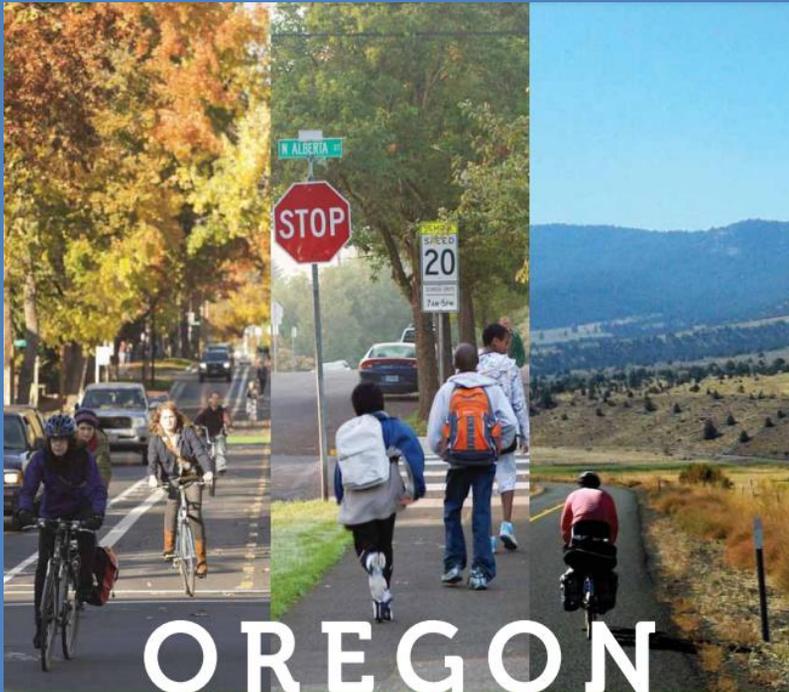
Pilot – Crossing Research



Moving Forward: Recommended Strategies

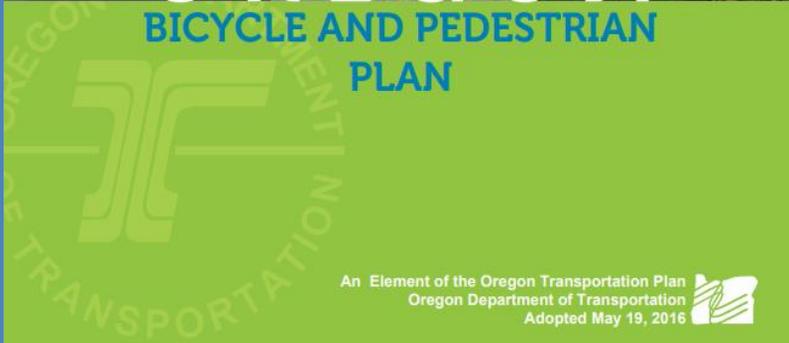
- 1. Plan for greater investment in the needs of people walking and rolling to transit**
- 2. Make more walking and rolling trips to transit possible**
- 3. Make walking and rolling trips to transit safer and more comfortable**
- 4. Better coordinate and communicate on pedestrian improvements**

STRATEGY	ACTION	AGENCY ROLES			
		COUNTIES + MUNICIPALITIES	METRO	TRIMET	ODOT
1 Plan for greater investment in the needs of people walking and rolling to transit	A	Incorporate the TriMet Pedestrian Plan priorities into Transportation System Plans and modal plans	●	●	
	B	Align infrastructure funding with priorities for pedestrian access to transit	●	●	●
	C	Collaborate for regional investments in pedestrian access to transit	●	●	●
	D	Track and evaluate improvements to pedestrian access to transit	●	●	●
2 Make more walking and rolling trips to transit possible	A	Close sidewalk and trail gaps within transit walksheds	●	●	●
	B	Prioritize adding marked and enhanced crossings within transit walksheds	●	●	●
	C	Develop local guidance to implement policies regarding the co-location of crossings with transit stops and stations	●	●	
	D	Create universally accessible routes to transit	●		●
3 Make walking and rolling trips to transit safer and more comfortable	A	Apply current best practices in pedestrian design, designing for safety of all ages and abilities	●	●	●
	B	Include pedestrian-scale lighting within transit walksheds	●	●	●
	C	Design for personal safety and security for people walking and rolling to transit	●	●	●
	D	Improve the legibility of navigating on foot or by mobility device to and from transit stops	●	●	●
4 Better coordinate and communicate on pedestrian improvements	A	Share technical resources for implementing this Plan	●	●	●
	B	Engage each other as stakeholders in project delivery	●	●	●
	C	Generate community awareness of the Plan	●	●	●



OREGON

BICYCLE AND PEDESTRIAN PLAN



An Element of the Oregon Transportation Plan
Oregon Department of Transportation
Adopted May 19, 2016



Statewide Active Transportation Needs Inventory

Description

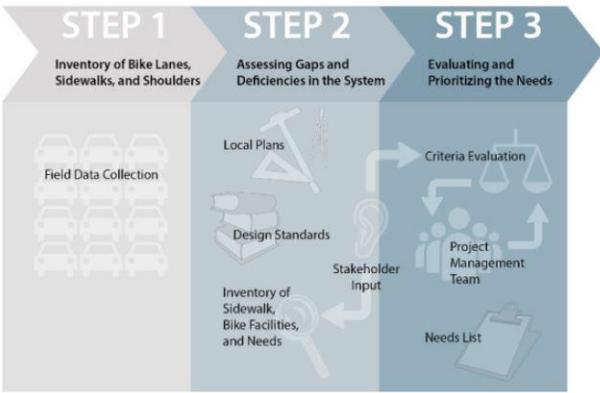
The Oregon Department of Transportation's Bicycle and Pedestrian Program is working to create a safer, more pedestrian and bicycle friendly network in and between communities across Oregon's highways in alignment with direction set in the Oregon Bicycle and Pedestrian Plan. In conjunction with ODOT Regions 1, 2, 3, 4 & 5, the project will update and create the Active Transportation Needs Inventory (ATNI) for a seamless network of Bicycle and Pedestrian needs for all ODOT highways.

The ATNI project will compile existing sidewalks, bicycle lanes, shared use paths, and shoulder data sets to provide an inventory of existing infrastructure, which is Key Initiative 1: Defining the Network of the Implementation Work Program in the Oregon Bicycle and Pedestrian Plan. Next, the project will assess needs and deficiencies with regards to rural and urban standards in the Highway Design Manual. Last, an evaluation of the gaps and deficiencies by the ATNI's established evaluation method will prioritize needs on state highways for the ODOT network.

Contact

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(503) 325-4281

[Jessica Horning](#), Pedestrian & Bicycle Program Manager
(503) 910-7178



ODOT ATNI - Evaluation Criteria and Prioritization

- Bicycle Prioritization Results**
- Pedestrian Prioritization Results
- Safety - Bike Crash Frequency
- Safety - Bike Crash Risk Factors
- Safety - Pedestrian Crash Frequency
- Safety - Pedestrian Crash Risk Factors

This map shows the final bicycle prioritization results based on the six factors listed in the evaluation criteria report. The higher the score, the higher the priority is on the roadway segment.

Click on the tabs to view the individual criteria and how they scored on the ODOT roadway network.

Bicycle Prioritization Scores

Total Weighted Prioritization Score

- 170 – 233 (99th Percentile)
- 135 – 169 (95th Percentile)
- 120 – 134 (90th Percentile)
- 103 – 119 (80th Percentile)
- 94 – 102 (70th Percentile)
- 87 – 93 (60th Percentile)
- 82 – 86 (50th Percentile)
- 76 – 81 (40th Percentile)
- 70 – 75 (30th Percentile)
- 0 – 69 (<30th Percentile)

Top Scoring Segment

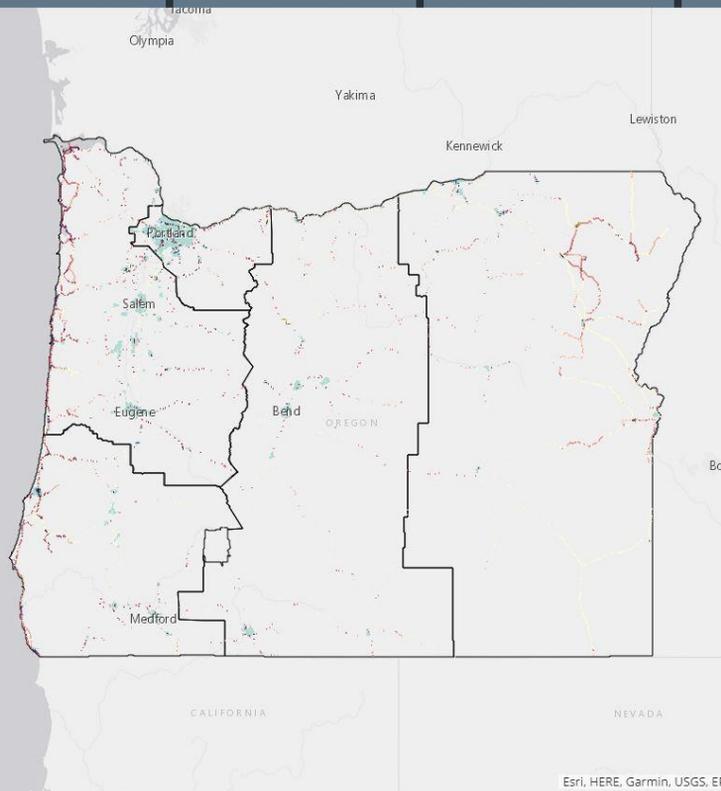
- Top Scoring Segment

Top Scoring Corridors

- Top Urban Corridor
- Top Rural Corridor

Urban Areas

Map navigation controls: zoom in (+), home, zoom out (-), search (magnifying glass).



ATNI Considerations

- Crash history and crash risk factors
- Level of traffic stress (bicycle only)
- Access to transit & essential destinations
- Fills gap in system
- Transportation disadvantaged communities
- Health – Respiratory hazards
- Tourism/economy (recreational routes)
- Needs identified in local plans
- Existing facility presence & condition



ATNI Prioritization

Factor	Weight (1-10)	Evaluation Criterion
Safety	8	Ped/bike crash frequency
		Ped/bike crash risk factors
Equity	7	Transportation disadvantaged communities
Connectivity	6	Bicycle Level of Traffic Stress
		Fills a gap in an area surrounded by existing facilities
Demand	4	Access to transit
		Access to essential destinations
		Bicycle tourism routes
Existing Conditions	4	Presence of existing conditions
Stakeholder Input	2	Local Plans/TSP Priorities

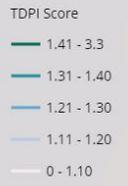
ODOT ATNI - Evaluation Criteria and Prioritization

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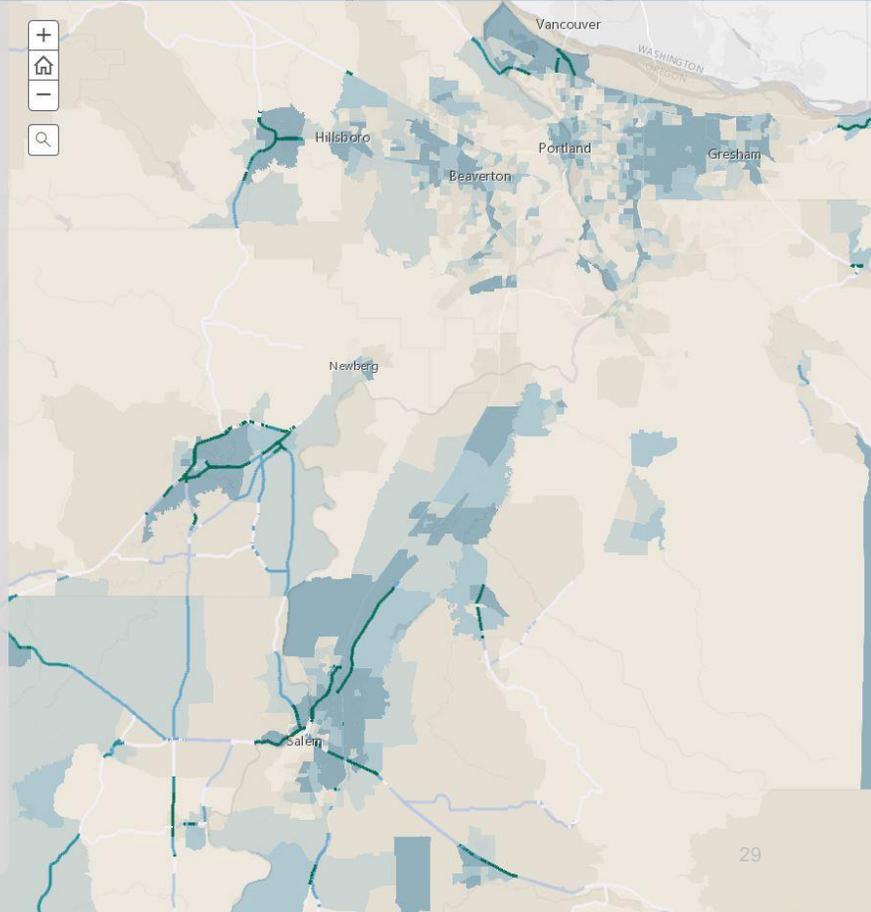
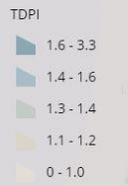
Transportation Disadvantaged Populations Index (TDPI) is an index of census data characteristics, designed to help prioritize improvements on highway segments that serve areas with high numbers of transportation disadvantaged residents and environmental justice communities that have been traditionally underserved. Census data includes:

- Elderly populations (65 and older)
- Youth populations (under 18)
- Non-white and Hispanic populations
- Low-income population (households earning less than 200% of the poverty level as determined by the census)
- Limited English proficiency population (aggregate of census populations who speak English "not well" or "not at all")
- Households without access to a vehicle
- People with a disability (severe or non-severe disability)
- Crowded Households

Equity - TDPI Score



Transportation Disadvantaged Populations Index (TDPI)



Thank You

Glen Bolen, AICP

Glen.a.bolen@ODOT.Oregon.gov



Project Coordination for Improved Transit Access

Darcy Cleaver & Craig Toocheck
Pittsburgh Regional Transit (PRT)

Paige Anderson
City of Pittsburgh
Department of Mobility & Infrastructure (DOMI)

October 24, 2022

About PRT & the Region

- Fixed route bus, LRT, and incline service (paratransit contracted out)
- 100 routes with 7,000 stops
- 2,800 staff (400 administrative, remainder in transit operations)
- Service area population 1.24 million (Allegheny County)
- **Service currently in 97 municipalities (out of 130 in County)**
- Several suburbs and towns represent pre-WWII development patterns and were trolley communities with walkable scale
- De-industrialization and population decline has left some municipalities hollowed out, with few resources



About City of Pittsburgh

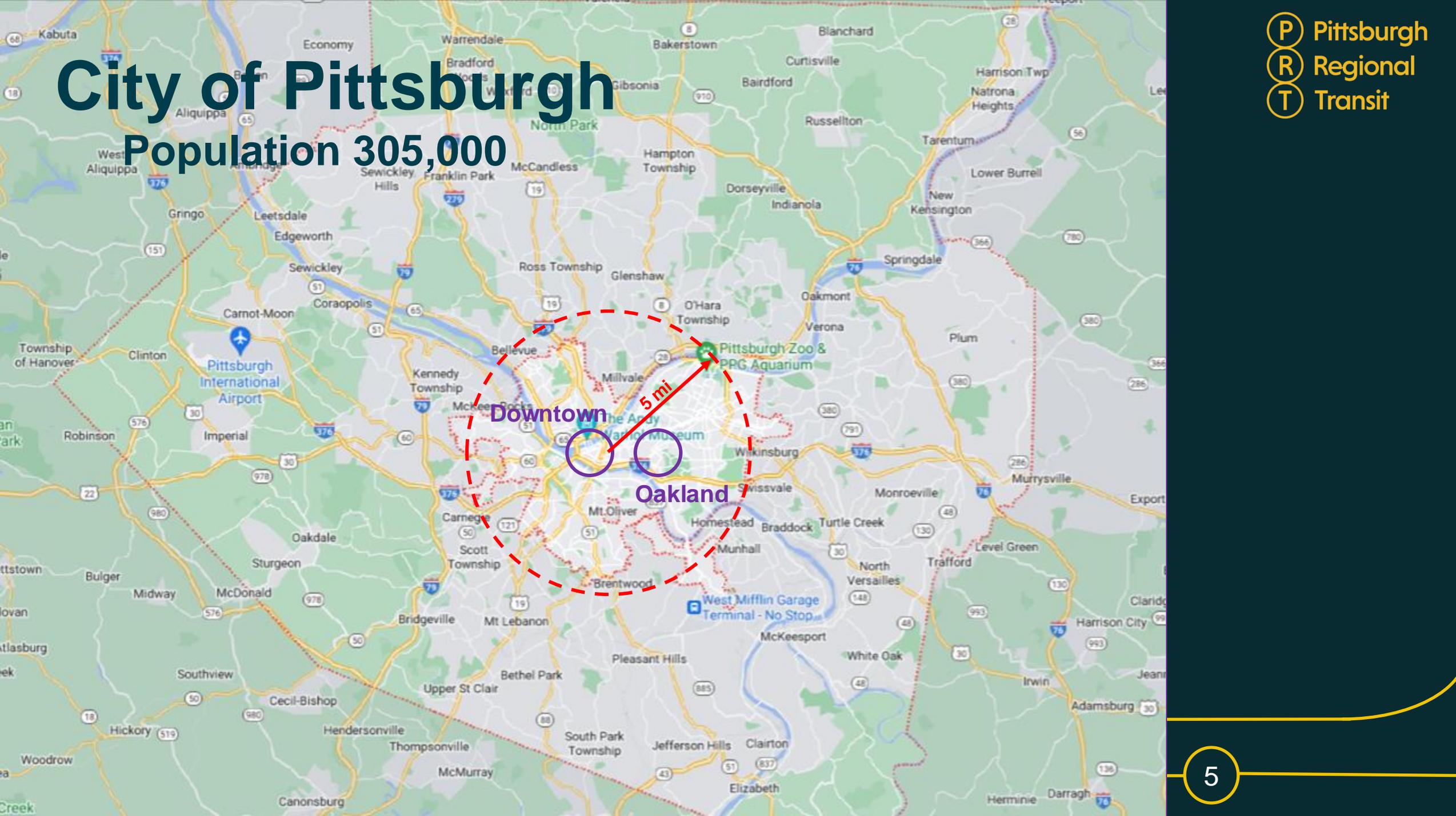
Department of Mobility & Infrastructure (DOMI)

- Population of 300,000
- DOMI established in 2017 to manage the public right of way, prioritizing equitable access & safety, regardless of one's access to a private motor vehicle.
- 3 Divisions: Project Design & Delivery, Planning & Policy, and Traffic
- <100 full-time staff
- DOMI right of way includes 1,000+ miles of roadway, 600+ traffic signals, 800+ public steps
- Established Traffic Calming program, Bike+ Plan & proposed Bike+ network

City of Pittsburgh

Population 305,000

- P Pittsburgh
- R Regional
- T Transit



How Pittsburghers Get Around

- 64 million annual PRT boardings pre-COVID (currently down about 50%)
- **High transit+walking mode share**

Pre-pandemic:

(2020 5-yr ACS Journey to Work)

Citywide: 17% transit; 10% walk

Countywide: 9% transit, 4% walk

Current:

(2021 1-yr ACS Journey to Work)

Citywide: 8.5% transit mode share; 7% walking

~20% moved to work-from-home from all modes

- **Half of commutes to Downtown & Oakland are via walking, biking, or transit**
 - 40% use transit as their #1 mode; 64% use transit always or sometimes (as a top-three mode)
 - 10% walk or bike as #1 modes (~5% each); 34% always or sometimes
 - 80% walk, bike, or use transit always or sometimes

(Make My Trip Count survey, 2018)

Project Coordination

How PRT works with partners on projects:

- Sponsor: directly designing, constructing, and/or funding access improvements
- Collaborate: supporting and working with others, providing staff time, data, or joining or supporting an application for additional resources
- Advocate: supporting project design and land use decisions that contribute to a network of mobility, typically when no property owned or controlled by PRT is involved

Project Coordination

PRT coordinates with local and state partners; developers, etc.

- Regularly scheduled meetings
 - City of Pittsburgh DOMI—monthly general updates and small projects
 - Pittsburgh Downtown Partnership—quarterly construction updates
 - Pittsburgh Water & Sewer Authority—monthly planned utility work
- Project-based meetings
 - PennDOT projects—PennDOT Connects process
 - PRT projects—outreach to stakeholders
 - Partner agency corridor or neighborhood plans
- PRT-created planning, policy, design, and engineering resources created for partners' use or reference



Success Stories

City One-off Project



Glenrose Street at Biggs Avenue: Worked with City of Pittsburgh's DOMI to build a boarding platform and retaining wall. Stop is accessed via city steps (seen at left below) and had previously been in the street due to topographical constraints. Summer 2021



City Streetscape Project

Downtown Pittsburgh: PRT collaborated with DOMI in the design and construction of shared bike lane bus boarding areas. (Summer 2020)



Liberty Ave at Commonwealth Pl



Stanwix St at Fourth Ave

Borough+Developer Project

Braddock Ave at Fourth (Braddock borough): PRT worked with Braddock and their developer to integrate a new improved bus stop in their park project (bump out, pedestrian infrastructure, seating, shelter, trash receptacle). Fall 2019



Institutional Project

Forbes Hospital: PRT worked with the hospital to extend the P68–Braddock Hills route and create a new bus stop and layover area at the hospital. September 2021



Neighborways



PRT worked with DOMI's traffic engineering team to ensure buses could safely navigate new neighborhood traffic circle and other traffic calming elements along 3 corridors in Pittsburgh's East End.



Downtown-Uptown-Oakland BRT

- Project in 3-mile long major transit corridor including major improvements such as bus lanes and upgraded bus “stations”, bike facilities, pedestrian streetscape enhancements, and utility upgrades.
- Project is a partnership between PRT, Allegheny County, and City of Pittsburgh



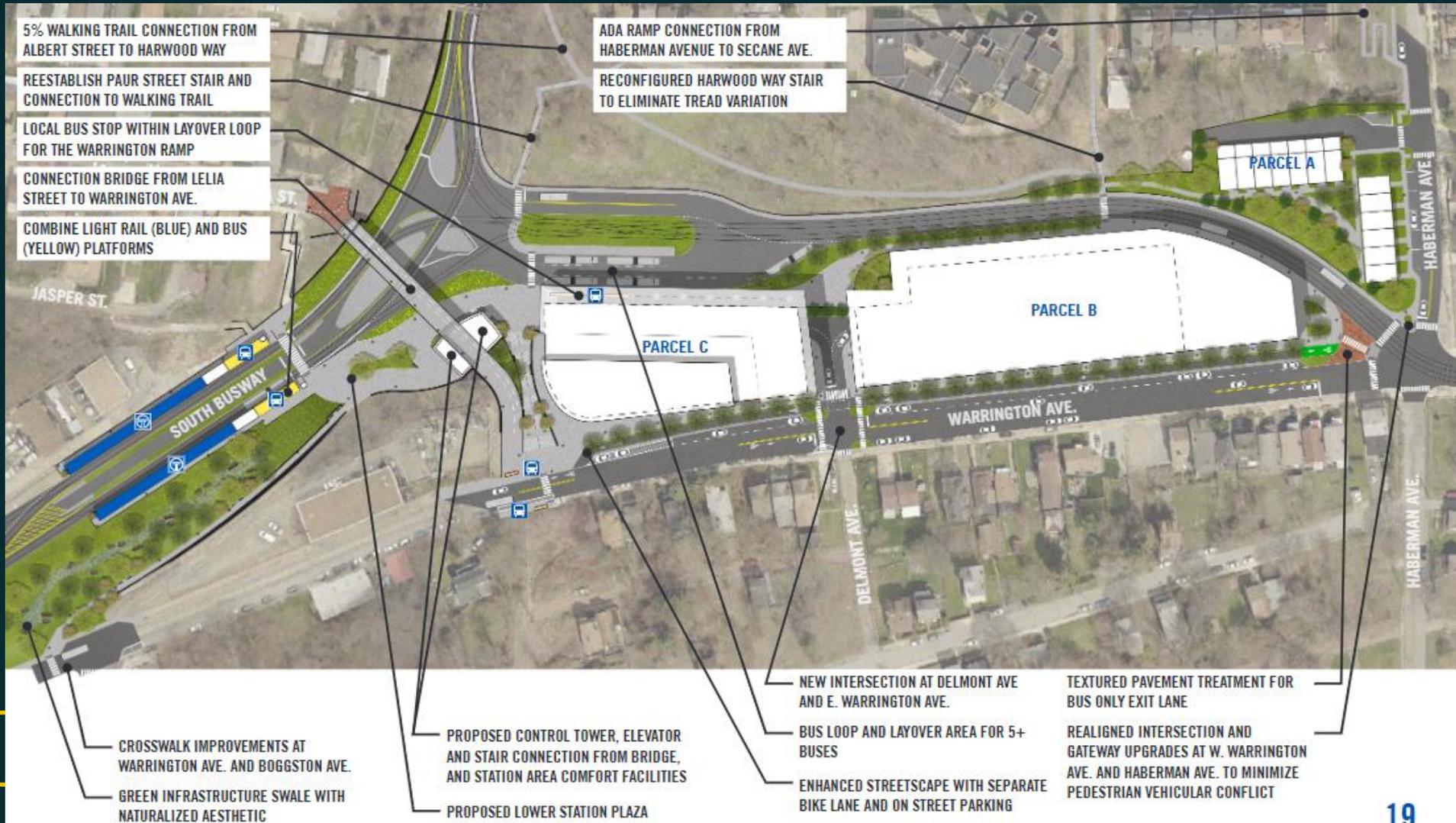
Improved Crossings

Various locations in the City of Pittsburgh: PRT worked with DOMI's traffic engineering team to improve crossings on various complete streets corridor projects, focusing on transit stops.



South Hills Junction Station Area Plan

Proposes upgrades to City ROW around South Hills Junction, where PRT owns parcels for potential redevelopment.



5% WALKING TRAIL CONNECTION FROM ALBERT STREET TO HARWOOD WAY

REESTABLISH PAUR STREET STAIR AND CONNECTION TO WALKING TRAIL

LOCAL BUS STOP WITHIN LAYOVER LOOP FOR THE WARRINGTON RAMP

CONNECTION BRIDGE FROM LELIA STREET TO WARRINGTON AVE.

COMBINE LIGHT RAIL (BLUE) AND BUS (YELLOW) PLATFORMS

ADA RAMP CONNECTION FROM HABERMAN AVENUE TO SECANE AVE.

RECONFIGURED HARWOOD WAY STAIR TO ELIMINATE TREAD VARIATION

CROSSWALK IMPROVEMENTS AT WARRINGTON AVE. AND BOGGSTON AVE.

GREEN INFRASTRUCTURE SWALE WITH NATURALIZED AESTHETIC

PROPOSED CONTROL TOWER, ELEVATOR AND STAIR CONNECTION FROM BRIDGE, AND STATION AREA COMFORT FACILITIES

PROPOSED LOWER STATION PLAZA

NEW INTERSECTION AT DELMONT AVE AND E. WARRINGTON AVE.

BUS LOOP AND LAYOVER AREA FOR 5+ BUSES

ENHANCED STREETScape WITH SEPARATE BIKE LANE AND ON STREET PARKING

TEXTURED PAVEMENT TREATMENT FOR BUS ONLY EXIT LANE

REALIGNED INTERSECTION AND GATEWAY UPGRADES AT W. WARRINGTON AVE. AND HABERMAN AVE. TO MINIMIZE PEDESTRIAN VEHICULAR CONFLICT

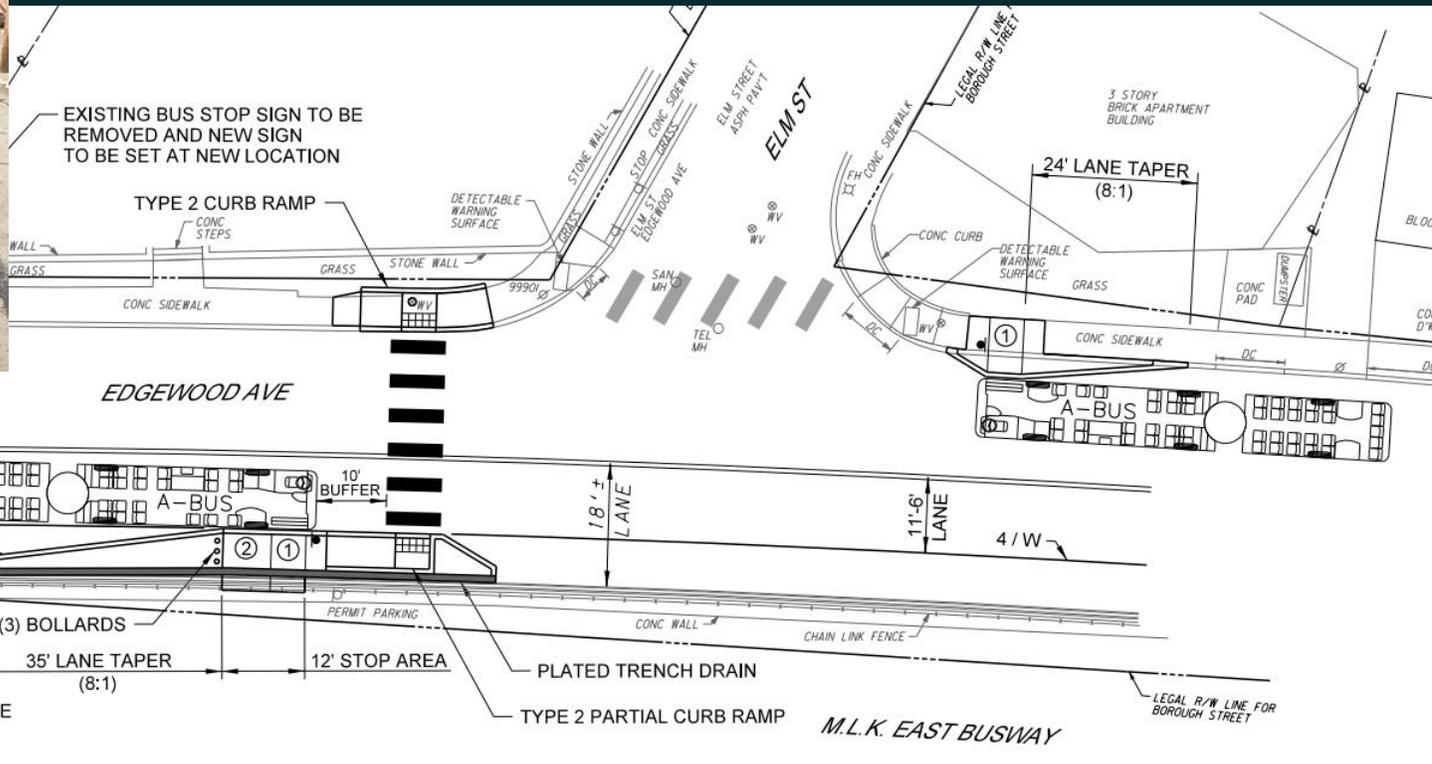


Improving Coordination

Improving Coordination: PennDOT Connects

- PennDOT Connects Process
 - Collaborator/sponsor role
 - PennDOT projects use “PennDOT Connects” process, which includes a checklist for topic areas to study and potential stakeholders to consult from project initiation.
 - We provide early input, review plans, provide comment, recommend transit upgrades
- PennDOT Connects Funding
 - Allows PRT decide how to use a portion of PennDOT funding distributed to PRT for use on PennDOT roads/projects
 - PRT coordinates with PennDOT in design/engineering phase
 - PRT enters into contribution agreement; PennDOT constructs

Improving Coordination: Maintenance Agreements



Improving Coordination: Guidelines

- **Bus Stop & Street Design Guidelines** [\[PDF\]](#)
 - General guidelines for PRT bus stops
 - Provides partner agencies and developers with basic design guidance to use before discussing details with PRT.
- **Stop Improvement Typical**
 - Document showing types of improvements, and guidelines on placement and dimensions; may be reviewed by engineering depending on project scale.
 - Provides standards for different types of improvements, allowing quicker review of proposed upgrades rather than needing site-specific review for every location.
 - Example: bump out guidance
 - Lays out required dimensions for street improvements
 - Provides options for most frequent site constraints
 - Detailed review as needed

Bus Stop & Street Design Guidelines



2. BUS STOP LOCATION: PLACEMENT

BUS STOP PLACEMENT

Street Location

Bus stops can be located in one of three areas on the street: near-side, far-side, and mid-block. Each variation has their advantages and disadvantages. A brief description of each stop is also provided below.

Near-Side Stop

Advantages

- Minimizes traffic interference during peak traffic flow hours.
- Passengers are able to board the bus closer to the crosswalk.
- Bus can use the intersection for acceleration space.
- Avoids double stopping for both signal and passenger movements.
- The driver has the advantage of full view of intersection activity.
- Can be coordinated with a far-side stop to allow transfers without crossing the street.

Disadvantages

- Conflicts between the bus and right-turning vehicles may arise.
- The bus can physically obscure general traffic and pedestrian sight lines.
- Multiple buses queuing during peak hours may obstruct traffic.
- May present a conflict between pedestrians crossing and passengers boarding the bus.
- Bus may sit through two cycles of a traffic signal due to passenger boarding or dwell time.



Bus at Intersection after Near-Side Stop

Far-Side Stop

Advantages

- Minimizes conflicts with right-turning vehicles.
- Minimizes sight line conflicts for drivers and pedestrians.
- Encourages pedestrians to cross more safely behind the bus.



3. CURBSIDE DESIGN: TYPOLOGY

STOP TYPOLOGY

SHELTER STOP ELEMENTS

1. Loading Pad

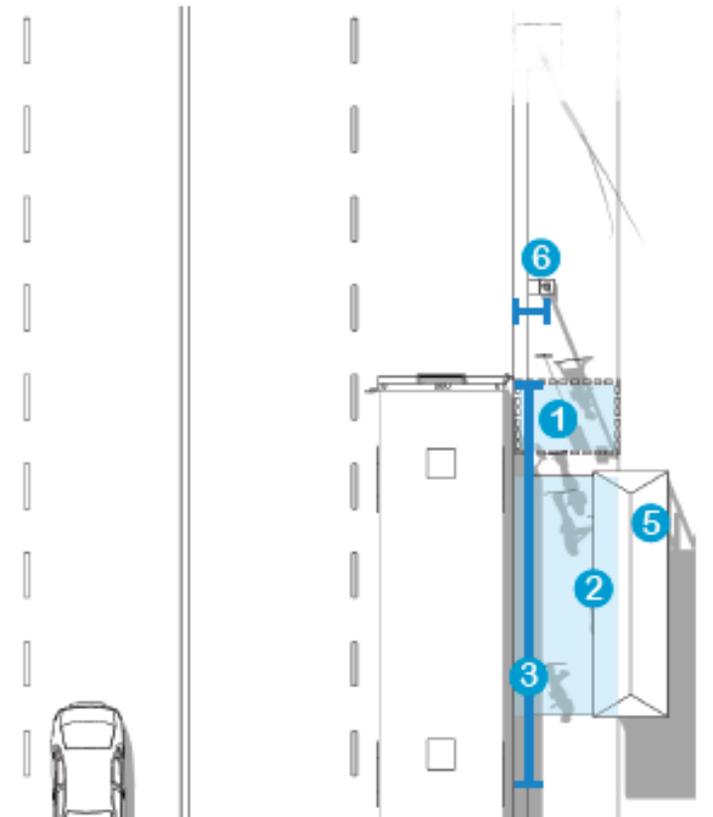
5 ft. long x 8 ft. deep; per ADA requirements, a pad must be firm, stable, and slip-resistant, and connected to the pedestrian path. Provide clear turning radius for wheelchair users. Loading pads should be provided for both front and rear (as shown here). Sign should be located adjacent to the rear pad to indicate bus stop.

Clearance between doors; waiting area can be partially covered by the pedestrian path if pedestrian volumes are high. Minimum net area for 9 passengers, including 6 within the shelter, 64 SF total. Shelter design and placement should be consistent with the guidelines.

The shelter should be kept free from obstructions along the curb and should provide free access to vehicle's front and rear.

Waiting Zone

The waiting zone should be on the pedestrian path, or wider, as called for by local conditions. It should be a firm, slip-resistant surface connected to the loading pad and the waiting area. Keep 3 ft. clear around all street



Typical Improvement Types

BUS STOP IMPROVEMENTS

BUS STOP IMPROVEMENTS

Existing bus stops that do not meet desired characteristics can be retrofitted to improve passenger comfort and safety.

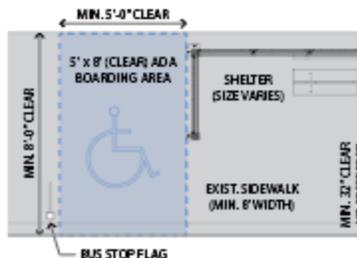
General Notes

- The following improvement types can be combined depending on site conditions and needs.
- A 5'x8' ADA-compliant, firm and stable boarding area, connecting to the curb, should be included wherever possible. (ADA §510)
- Sidewalks should provide a minimum of 36" continuous clear space, but may be reduced to 32" for runs of no greater than 24" (ADA §403.5). A minimum width of 48" is desirable where possible, especially where adjacent to fast-moving traffic.
- Where space is limited, sidewalk should be widened, or a bumpout used, to expand sidewalk depth to at least 8' to provide space for an ADA boarding area.
- At bus stops without a continuous sidewalk network, short stretches of sidewalk may be used to connect existing curb ramps to a boarding area.

- Boarding areas at bus stops should be located at or before stop bar, or at least 4' before a crosswalk, where possible.
- Areas with planting strips between the sidewalk and curb should be filled with concrete to a minimum width of provide a continuous connection to the curb and boarding area.
- Where an existing sidewalk is not wide enough for a slab, additional width can be provided with a new concrete slab. Dimensions of required slab will vary based on width of existing sidewalk and size of shelter.
- Slabs should be 6" thick reinforced concrete.
- Shelter anchor holes should be at least 6" from slab or control joints.
- Refer to specifications to verify shelter dimensions and installation requirements.

Type 1: Shelter on Existing Sidewalk

- Shelters may be placed on sidewalks with sufficient width without additional work required.
- Sidewalks must be at least 8' wide to provide a 5'x8' ADA-compliant boarding area.
- Sidewalks should provide a minimum of 36" continuous clear space, for travel paths, which may be reduced to 32" for runs of no greater than 24" (ADA §403.5). A minimum width of 48" is desirable where possible, especially adjacent to fast-moving traffic.
- Shelter size should be selected based on sidewalk width in order to meet required clear widths.

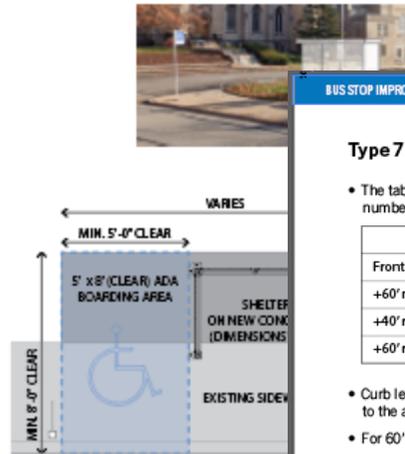


Pittsburgh Regional Transit / Bus Stop and Street

BUS STOP IMPROVEMENTS

Type 2: Shelter on Widened Sidewalk

- On narrower sidewalks, a new slab may be required to provide space for a shelter and required clear space.
- Dimensions of required slab will vary based on width of existing sidewalk and size of shelter.
- An ADA-compliant 5'x8' boarding area should be provided.
- Shelter anchor holes should be a minimum of 6" from or control joints or edges of any slab.
- Sidewalks should provide a minimum of 36" continuous clear space for travel paths, which may be reduced to 32" for runs of no greater than 24" (ADA §403.5). A minimum width of 48" is desirable where possible, especially adjacent to fast-moving traffic.



Type 3: Planting Strip Infill Slab

- A planting strip infill slab provides a new slab to allow for a continuous firm and stable connection from sidewalk to curb.
- Minimum 5' clear width to accommodate ADA boarding area.
- Infill slab may be wider to accommodate a bus flag or other items in this area.



BUS STOP IMPROVEMENTS

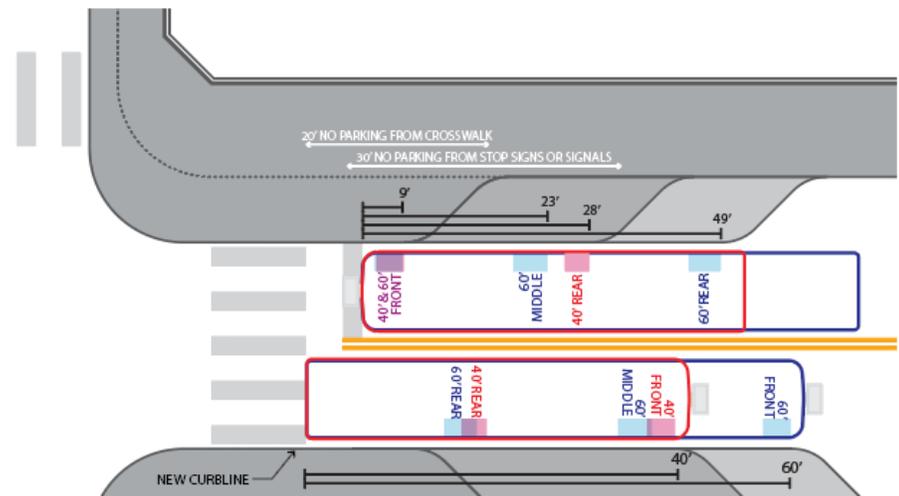
Type 7: Boarding Bulb Dimensions and Design Details

- The table below shows the length of curb needed to serve different numbers of doors on different buses.

	Near-side	Mid-block	Far-side
Fronts only	9'	5'	40'
+60' middle	23'	20'	n/a
+40' rear	28'	24'	40'
+60' rear	49'	39'	60'

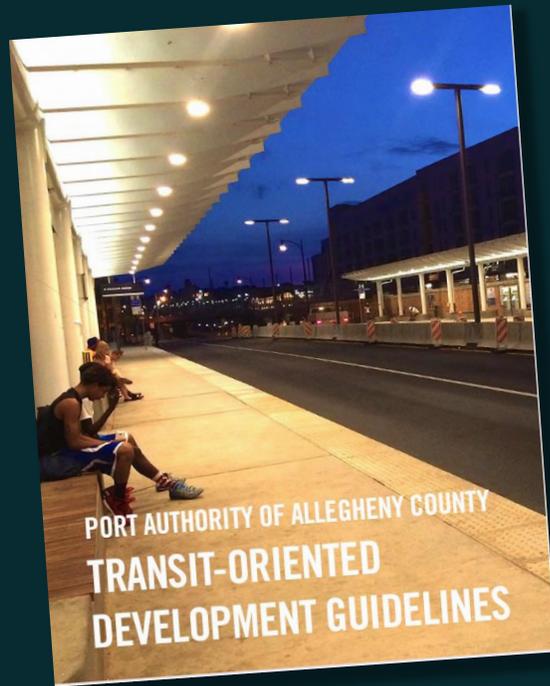
- Curb length should be minimally curved and run continuously parallel to the adjacent travel lane.
- For 60' buses, the longest dimension for all 60' fleet vehicles is used.
- For near-side stops, dimensions should be measured from the stop bar, approximately 4' before a crosswalk (See PA Title 75 §102).
- For far-side stops, dimensions should be measured after the crosswalk.

- Front door only design should only be used when another solution is not physically feasible. Otherwise, at least two doors of the bus should be prioritized for safe loading and unloading to keep operational movements efficient and stopping time minimal.
- Where space is limited, a bumpout should expand sidewalk depth to at least 8' to meet ADA guidelines.
- When extending into a parking lane, boarding bulb depth should be 12" less than the width of the parking lane.
- At locations with lane reductions, infrequent on-street parking, or higher speeds, a longer approach taper designed using the WS/60 formula, optionally including bollards, may be desirable.



T.O.D. Guidelines

Guide to best practices for transit-oriented development and supporting policies.



2. TOD TYPOLOGY

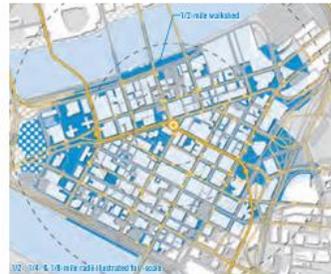
TYPE: DOWNTOWN

Downtown stations are located in or on the perimeter of Downtown Pittsburgh's urban core. Serving as the largest employment center in the region, the area experiences the highest density of ridership in Port Authority's system. The stations in this category consist of three central stations, four stations on the immediate perimeter of central Downtown, and two stations across the river from central Downtown and adjacent to major North Shore attractions: PNC Park, Heinz Field, and Rivers Casino. Due to a lack of permanence and infrastructure, the Downtown on-street bus stops that serve busway routes (such as the P1 and G2) are not included in this type. If, in time, these stops become more permanently integrated, inclusion is possible.

As regional destinations for work and entertainment, these stations experience high levels of ridership. In transit systems where downtown is designated as the central point, as in Allegheny County, connections to local (on-street) and rapid (designated right-of-way) transit are strongest for this station type.

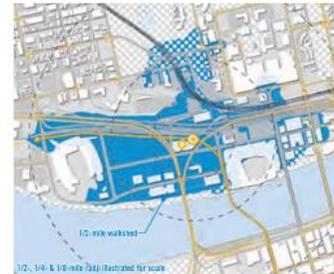
Automobile parking at Downtown stations should not exist because they are the end destination for a large volume of riders, transit is readily available, development opportunities are limited, and there is a density of uses and attractions nearby. High levels of transit service are provided to these stations throughout the work day and during special events, easing the challenges of limited parking and road congestion.

These parking and congestion challenges also highlight the importance of providing robust multimodal access. Pedestrian connections to high-rise, mixed-use development in the urban core is vital to these stations areas. Access and connectivity are generally well-accommodated where the topography is relatively flat and there are small, dense blocks. With a growing cycling culture, it is increasingly important to provide bike access and parking at all Downtown stations. Recently-established and future bike lanes facilitate car-free access to downtown and surrounding areas.



Example: Gateway Station

Rebuilt in 2012, Gateway Station is located at the southernmost end of the Allegheny River Tunnel, which connects Downtown Pittsburgh to the North Shore. As with any downtown station, high-rise employment offices are abundant. Unique to Gateway Station is the easy access to Point State Park, home of festivals and recreation, as well as Pittsburgh's Cultural District, which offers arts and entertainment.



Example: North Side Station

North Side Station is one of the newest stations in Port Authority's system. Less than half a block from PNC Park, Pittsburgh's baseball stadium, the area surrounding North Side Station consists largely of highways, parking lots, and businesses catering to game-day crowds. When games are not in session the presence of restaurants, a concert venue, and riverfront parks and trails bring crowds to compliment office and parking uses.

2. TOD TYPOLOGY

TYPE: URBAN MIXED USE

Urban Mixed Use stations serve highly-populated, mixed-use neighborhoods of a considerably smaller scale than Downtown areas. Within this type, mixed use is prevalent; three to six jobs exist for every four residents. These stations serve as both a transit origin and destination due to the variety of land uses. Transit service is likely frequent, provided by fixed-guideway service and various local routes. Pedestrian connections are critical, linking the station to surrounding multi-family residential and mid-rise buildings. Typically, higher-density and smaller blocks support easy travel by foot, but sidewalks and other pedestrian infrastructure may need upgrading.

The need to accommodate automobile access, connectivity and parking varies from station to station. Because the density and type of development within Urban Mixed Use areas is multimodal-friendly, car-centric planning should not be prioritized. For new development, parking should be reduced – if it is needed at all

– and a district-serving parking strategy should be implemented rather than a site-by-site approach.

For station planning purposes, the goal is maximizing ridership by providing an appropriate mix of land uses and robust transit access. For most stations this will mean Park and Rides are not appropriate because land is better used for mixed-use destinations. The exception, Carnegie Station, is located near a dense, mixed-use area but it is also an important Park and Ride location. It's the end of the line and demand for outtrips supply. In this case, it is important to develop a TOD solution that balances the needs of transit riders, Port Authority, and the local municipality, as well as market realities.

At the time of this publication, four stations meet the density and mixed use criteria of this category. It is possible for new stations of this type to be built, and for existing stations to become Urban Mixed Use areas as a result of infill development.



Example: Negley Station

On the Purple Line (East Busway), Negley Station is located in Pittsburgh's a compact, mixed-use, eastern neighborhood of Shadyside. Shadyside is home to three business corridors, two of which are in the Negley Station walkshed. With limited opportunities for new development, the planning and design of TOD and any station improvements will be critical to ensuring the future success of the station as an asset to both riders, community members, and the Port Authority.

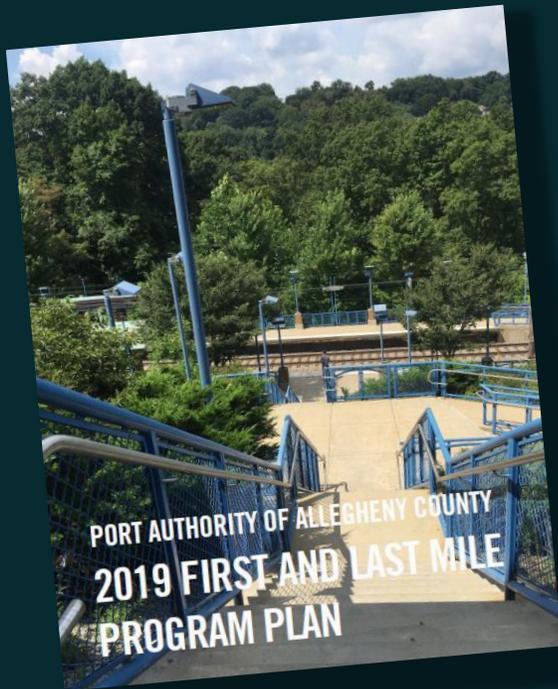


Example: Carnegie Station

Carnegie Station, the last, southernmost stop on the Green Line (West Busway), opened in 2000. The station sits in the commercial core of Carnegie Borough and includes a large surface Park and Ride lot. A study determined that Carnegie Station is ready for TOD due to its available building stock, infill opportunities and proximity to Pittsburgh, among others strengths. The same study recommended replacing the existing surface parking lot with a structure containing parking and a mix of office and retail uses, a project PAAC is currently pursuing.

First and Last Mile Program Plan

Provides recommendations for improving transit access, including prioritization of PRT stations with the most need.



FIRST AND LAST MILE TOOLBOX

- **Signage** informs cyclists of where the tunnel is and how to use it to transport a bike.
- Promote Bikes on Transit**
 - **Signage** clarifies bike boarding process for bus and light rail vehicles.
 - **Transit wayfinding** on bike facilities raises awareness of and supports bikes connections to transit.
- Collect Bike Data**
 - **Counting methods** should be chosen based upon which type is best for each specific route.
 - **Popular routes** should be targeted to identify and analyze the areas with the highest bike traffic.
- Provide Repair Space**
 - **Adequate lighting** maximizes safety at repair station and prevents theft and vandalism.
 - **Installation location** of repair stations should be near bike storage and busy bike corridors.

Future guidance is being developed for Port Authority property.

3. Transit

As noted previously, the line between transit transfers and first and last mile trips is undefined. Some riders may make transfers simply to complete the last leg of their journey more quickly, while others require the transfer to get where they are going. The tools in this section, therefore, are generalized to promote better transit for all users. To improve transit as either a primary mode of travel or as a FLM service, support from agency partners in the following ways can greatly improve the rider's journey.

- Dedicate Right-of-way for Buses**
 - **Painted bus lanes** make lanes stand out from traffic.
 - **Peak-only bus lanes** target areas with bad congestion at certain times of the day, such as rush hour.
- Minimize Conflict between Buses and Other Vehicles**
 - **Appropriate turning radii** ensures that buses have enough space to navigate tight intersections without imposing on curb space.
 - **Boarding islands** minimize bus-bike conflicts and give pedestrians a protected place to wait for bus.
 - **Transit signal priority** detects bus presence and coordinates signals to give buses right-of-way.
 - Refer to Port Authority's Bus Stop Design and Street Design Guidelines.
- Make On-street Bus Stops Comfortable**
 - **Lighting** makes the stop feel safe at all hours of the day.
 - **Shelters, benches, trash cans, and recycling bins** provide amenities for riders at stops.
 - **Signage** informs riders of routes at the stop, when buses will arrive, and how to contact customer service.
 - Refer to Port Authority's Bus Stop Design and Street Design Guidelines.



Bike racks like these on municipal property adjacent to Mt. Lebanon Station offer a safe place for riders to store their bikes.



Unique bike racks in the Cultural District of Downtown Pittsburgh add art to the public space while serving a functional purpose.



Dedicated bus lanes, such as this one on Liberty Avenue, separate buses from traffic and are especially beneficial at rush hour. Bright red paint helps the bus lanes stand out even more.

- Facilitate Transfer Process**
 - **Real-time data** informs riders of when their transfer will arrive.
 - **Wayfinding** makes it easy for riders to transfer to a different transit route.
- Dedicate Waiting Zone**
 - **Coordination with bus and light rail** ensures that the waiting zone does not interfere with operations.
 - **Multiple directions of access** allow people to access the location from different streets.
 - **Signage** defines an exact location for pick-ups and drop-offs.
- Coordinate with Paratransit**
 - **Locations with high paratransit usage** should be prioritized and maintained to assure ADA compliance.
- Coordinate Deliveries**
 - **Coordination with loading zones** minimizes conflicts with other vehicle modes that may need to access the curb space.
- Plan for New Transportation Trends Utilizing Curb Space**
 - **Active dialogue** ensures that there is communication with external organizations that may need to access the curb space and the policy makers that will define curb access regulations.

5. Park and Ride

While many Park and Rides are owned and operated by Port Authority, other entities do operate Park and Rides for PAAC service.

- Prioritize Carpool**
 - **Reserved parking spaces** offer spots close to the station that are exclusively for carpools (example: "Carpools only before 9:30 a.m.").
- Prioritize Car Share**
 - **Dedicated parking spaces** incentivize car-share use as another alternative mobility option.
- Increase Safety**
 - **Emergency call boxes** make riders feel more comfortable using the facility at night.
 - **Frequent lighting** reduces crime and increases the feeling of safety.



Drop-off zones, like this one next to Rialto station, provide space for vehicles to pull over when picking up and dropping off riders at the busway. Benches, a bike rack, and clear signage add to the amenities at this drop-off.



Park and Rides, such as this one in Bethel Park, offer a viable alternative for suburban commuters, as they allow riders to park their cars at a station and use transit for the remainder of their commute.

Questions?

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Links

- [DOMI Complete Streets Program](#)
- [PRT Projects & Programs](#)
- [PRT Surveys & Reports](#)
(including guidance documents)