Improving Safety for Pedestrians and Bicyclists Accessing Transit Guide

Monday October 24, 2022
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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
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

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.
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.

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

Source: FHWA
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
Overcoming Barriers to Safe Accessible Transit

- Changing Driver Behavior Near Transit Stops
- Co-locating Mobility Options
- Technological Solutions to Route Planning
- Addressing Sidewalk Maintenance
- Resilience Planning for Emergency Response

Source: Mobility Hubs Guidance, CoMoUK
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...
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Elissa Goughnour
Senior Transportation Project Manager
VHB
Egoughnour@vhb.com
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

Step 1: Route Access Mapping
- Existing + Future Transit Service
- Existing Pedestrian Network
- Destinations

Step 2: Project Mapping
- Sidewalk Infill Projects
- Trail Projects
- New Road Projects

Step 3: Gap Identification

Step 4: Evaluation
- Safety
- Equity
- Demand

Step 5: Prioritization
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

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

<table>
<thead>
<tr>
<th>Mode</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk</td>
<td>86.7%</td>
</tr>
<tr>
<td>Personal Vehicle</td>
<td>27.4%</td>
</tr>
<tr>
<td>Rice</td>
<td>13.4%</td>
</tr>
<tr>
<td>Other</td>
<td>4.7%</td>
</tr>
<tr>
<td>Bike or Scooter</td>
<td>2.9%</td>
</tr>
<tr>
<td>Ride-Hailing Service</td>
<td>1.6%</td>
</tr>
<tr>
<td>Car Share</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

Figure 3: Frequency of Walking to Access Transit

- 3.7% Once or twice a year
- 2.3% Once or twice a year
- 1.5% Never
- 46.0% Almost every day
- 25.4% Most weekdays
- 6.4% At least once a month

Figure 4: Common Issues Faced when Accessing Transit

- Lack of safe crossings: 38.2%
- Lack of lighting: 35.6%
- Lack of sidewalks: 32.2%
- Distance: 27.7%
- It is not hard for me: 27.3%
- Unpleasant walking conditions: 22.7%
- Apps don't have walking info: 14.7%
- No direct route: 13.6%
- Other: 13.6%
- Lack of directional signage: 10.8%
- Lack of curb ramps: 6.2%
- Disability creates limitations: 2.7%

Figure 5: What Would Prompt More Frequent Walks to Transit

- Shorter wait: 50.5%
- Better lighting: 35.4%
- Safer crossings: 33.1%
- Closer stops: 30.2%
- Sidewalks: 28.6%
- More pleasant walk: 24.2%
- Better weather: 17.1%
- Other places along route: 15.7%
- Other: 14.0%
- A scooter/bike were available: 5.9%
- I had to pay for parking: 2.7%
Online Open House

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
Low - High

Equity
Very Important

Safety
Important

Demand
Somewhat Important

In which community do you Live?
Select

In which community do you work or go to school?
Select

Submit
Cancel
Analysis – Step 1

**Step 1**
ROUTE ACCESS MAPPING
- Existing & Future Transit Service
- Existing Pedestrian Network
- Destinations

**Step 2**
PROJECT MAPPING
- Sidewalk Infill Projects
- Trail Projects
- New Road Projects

**Step 3**
GAP IDENTIFICATION

**Step 4**
EVALUATION
- Safety
- Equity
- Demand

**Step 5**
PRIORITYZATION

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**CATEGORY**

Existing and Future Transit Service
- Existing:
  - MAX Lines
  - WES
  - Streetcar
  - Bus lines (frequent, standard, time-specific service)

Existing Pedestrian Network
- Regionwide existing sidewalk and pedestrian trail/pathway inventory

Destination
- Top Attractors
- Services
- Major Employers
- Institutes of Higher Education

**INPUTS**

Existing:
- MAX Red Line extension
- SW Corridor Light Rail
- Division Transit BRT
- Bus lines (frequent, standard service)

**SOURCE**

TriMet

OpenStreetMap

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
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

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

**Composite Score**
- **40%** Safety
- **30%** Equity
- **30%** Demand
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  Medium  High

Newly identified sidewalk gaps that are low priority

Transit Facilities (zoom to view)
- Bus Stops
- MAX / WES Stops

Project Location

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
# Products – Project List

<table>
<thead>
<tr>
<th>Project ID</th>
<th>Length (feet)</th>
<th>Project Location: Jurisdiction</th>
<th>Project Location: Street</th>
<th>Project Type</th>
<th>Project Source</th>
<th>Primary Description 1</th>
<th>Secondary Description 1</th>
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<td>134</td>
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<td>On-street</td>
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<td>On-street</td>
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<td>3122</td>
<td>486</td>
<td>Forest Grove</td>
<td>15th Avenue</td>
<td>Sidewalk Infill</td>
<td>Forest Grove</td>
<td>Construct 19th Avenue as 2-lane arterial between C and E S/E Street Pacific Ave Extension</td>
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<td>Singer Creek Connectivity Improvements</td>
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<td>Complete sidewalk gaps</td>
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<td>Ash Street</td>
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<td>250’ long pathway: 1,000’ long sidewalk, 5’ wide. Section between Ash Street Sidewalk and Pathway - Erickson Street to OB6</td>
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<td>Ash Street</td>
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<td>3171</td>
<td>1025</td>
<td>Unincorporated Clackamas County</td>
<td>Amherst Road</td>
<td>Sidewalk Infill</td>
<td>Lake Oswego</td>
<td>1,700’ long, 6’ wide curb tight sidewalks. At water needs to be Amherst Road Sidewalks - Kaiser Road to Boca Raton Drive</td>
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<td>3172</td>
<td>902</td>
<td>Lake Oswego</td>
<td>6th Avenue - Foothills Rd to Portland New Roadway</td>
<td>Sidewalk Infill</td>
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<td>1,000’ long new construction of three blocks of 6th Avenue, im 6th Avenue - Foothills Rd to Foothills Park</td>
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<td>Gladstone</td>
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<td>Install sidewalks on the east side Beaverton Ave from Clackamast P16</td>
<td>P17</td>
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<td>Boca Raton Drive</td>
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<td>1,600’ long, 5.5’ wide curb-tight sidewalk along the east side Boca Raton Pathway</td>
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<td>Trail Project</td>
<td>Lake Oswego</td>
<td>1000’ long, 6’ wide separated asphalt pathway. Completes a Boones Berry Road - Washington O1 to Existing Sidewalk</td>
<td></td>
</tr>
<tr>
<td>3234</td>
<td>247</td>
<td>Lake Oswego</td>
<td>Boones Ferry Road</td>
<td>Trail Project</td>
<td>Lake Oswego</td>
<td>1,620’ long, 6’ wide asphalt shoulder pathway. Connects two L0-Tigard/Bridgetown-to-Milwaukie Trail Connection</td>
<td></td>
</tr>
<tr>
<td>3235</td>
<td>470</td>
<td>Lake Oswego</td>
<td>Boones Ferry Road</td>
<td>Trail Project</td>
<td>Lake Oswego</td>
<td>3,620’ long, 6’ wide asphalt shoulder pathway. Connects two L0-Tigard/Bridgetown-to-Milwaukie Trail Connection</td>
<td></td>
</tr>
<tr>
<td>3236</td>
<td>469</td>
<td>Lake Oswego</td>
<td>Boones Ferry Road</td>
<td>Trail Project</td>
<td>Lake Oswego</td>
<td>3,620’ long, 6’ wide asphalt shoulder pathway. Connects two L0-Tigard/Bridgetown-to-Milwaukie Trail Connection</td>
<td></td>
</tr>
<tr>
<td>3237</td>
<td>194</td>
<td>Lake Oswego</td>
<td>Boones Ferry Road</td>
<td>Trail Project</td>
<td>Lake Oswego</td>
<td>3,620’ long, 6’ wide asphalt shoulder pathway. Includes wide Twin Fm - Upper to Boones Ferry Pathway</td>
<td></td>
</tr>
<tr>
<td>3238</td>
<td>2962</td>
<td>Lake Oswego</td>
<td>Lake Oswego</td>
<td>Sidewalk Infill</td>
<td>Metro</td>
<td>3,600’ long widening includes retaining walls above and below Boones Ferry Rd bike lanes</td>
<td></td>
</tr>
<tr>
<td>3245</td>
<td>2351</td>
<td>Fairview</td>
<td>Bridge Street</td>
<td>Sidewalk Infill</td>
<td>Fairview</td>
<td>Proposed sidewalks</td>
<td></td>
</tr>
<tr>
<td>3247</td>
<td>2355</td>
<td>Oregon City</td>
<td>Brighton Avenue</td>
<td>Sidewalk Infill</td>
<td>Oregon City</td>
<td>Brighton Avenue/Fairview Avenue Sidewalk</td>
<td>W04</td>
</tr>
<tr>
<td>3254</td>
<td>1499</td>
<td>Lake Oswego</td>
<td>Bryant Road</td>
<td>Sidewalk Infill</td>
<td>Lake Oswego</td>
<td>7,500’ long, combo of bike lanes (wideners), pathways, and Bryant Road Bike Lanes and Pathway</td>
<td></td>
</tr>
<tr>
<td>3256</td>
<td>197</td>
<td>Lake Oswego</td>
<td>Bryant Road</td>
<td>Sidewalk Infill</td>
<td>Lake Oswego</td>
<td>7,500’ long, combo of bike lanes (wideners), pathways, and Bryant Road Bike Lanes and Pathway</td>
<td></td>
</tr>
<tr>
<td>3257</td>
<td>772</td>
<td>Unincorporated Clackamas County</td>
<td>Bryant Road</td>
<td>Sidewalk Infill</td>
<td>Lake Oswego</td>
<td>14,600’ (2.65 mi) long bike lanes, both sides. Widening near Iron Mountain/Upper Dexe Bike Lanes</td>
<td></td>
</tr>
<tr>
<td>3259</td>
<td>285</td>
<td>West Linn</td>
<td>Buck Street</td>
<td>Trail Project</td>
<td>West Linn</td>
<td>On-street</td>
<td>Failing Bl/West A St</td>
</tr>
</tbody>
</table>
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 a 1/4 mile of a stop. 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 tactile surfaces, curbs extensions, high-visibility marked crosswalks, curb extensions, and not include slip lanes.

Omitting the analysis of intersections as not sufficient, sufficient, or convenient. Intersections that are marked as insufficient and meet at least one sufficient crossing in all four potential directions. For example, a standard four-way intersection would need at least one sufficient crossing in the north-south direction and a sufficient crossing in the east-west direction to be considered sufficient. While these intersections allow pedestrians to cross the street in both directions, they may require an 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 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
<table>
<thead>
<tr>
<th>STRATEGY</th>
<th>ACTION</th>
<th>COUNTIES + MUNICIPALITIES</th>
<th>METRO</th>
<th>TRIMET</th>
<th>ODOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Plan for greater investment in the needs of people walking and rolling to transit</td>
<td>A Incorporate the TriMet Pedestrian Plan priorities into Transportation System Plans and modal plans</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B Align infrastructure funding with priorities for pedestrian access to transit</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C Collaborate for regional investments in pedestrian access to transit</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D Track and evaluate improvements to pedestrian access to transit</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Make more walking and rolling trips to transit possible</td>
<td>A Close sidewalk and trail gaps within transit walksheds</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td></td>
<td>B Prioritize adding marked and enhanced crossings within transit walksheds</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C Develop local guidance to implement policies regarding the co-location of crossings with transit stops and stations</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D Create universally accessible routes to transit</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Make walking and rolling trips to transit safer and more comfortable</td>
<td>A Apply current best practices in pedestrian design, designing for safety of all ages and abilities</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B Include pedestrian-scale lighting within transit walksheds</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C Design for personal safety and security for people walking and rolling to transit</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D Improve the legibility of navigating on foot or by mobility device to and from transit stops</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Better coordinate and communicate on pedestrian improvements</td>
<td>A Share technical resources for implementing this Plan</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B Engage each other as stakeholders in project delivery</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C Generate community awareness of the Plan</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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 updated 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.
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)
  - 136 – 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**
Active Transportation Needs Inventory (ATNI)

A management system that informs investments

- Inventory of the existing pedestrian, bicycle and shoulder facilities on state highways
- Assessment of the existing facilities relative to ODOT’s minimum design standards
- An evaluation of gaps and deficiencies using evaluation criteria to prioritize system needs
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
<table>
<thead>
<tr>
<th>Factor</th>
<th>Weight (1-10)</th>
<th>Evaluation Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>8</td>
<td>Ped/bike crash frequency</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ped/bike crash risk factors</td>
</tr>
<tr>
<td>Equity</td>
<td>7</td>
<td>Transportation disadvantaged communities</td>
</tr>
<tr>
<td>Connectivity</td>
<td>6</td>
<td>Bicycle Level of Traffic Stress</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fills a gap in an area surrounded by existing facilities</td>
</tr>
<tr>
<td>Demand</td>
<td>4</td>
<td>Access to transit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Access to essential destinations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bicycle tourism routes</td>
</tr>
<tr>
<td>Existing Conditions</td>
<td>4</td>
<td>Presence of existing conditions</td>
</tr>
<tr>
<td>Stakeholder Input</td>
<td>2</td>
<td>Local Plans/TSP Priorities</td>
</tr>
</tbody>
</table>
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 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

<table>
<thead>
<tr>
<th>TDPI Score</th>
<th>Color</th>
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<td>1.41 - 3.3</td>
<td>Green</td>
</tr>
<tr>
<td>1.31 - 1.40</td>
<td>Teal</td>
</tr>
<tr>
<td>1.21 - 1.30</td>
<td>Blue</td>
</tr>
<tr>
<td>1.11 - 1.20</td>
<td>Light Blue</td>
</tr>
<tr>
<td>0 - 1.10</td>
<td>Light Gray</td>
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</table>

Transportation Disadvantaged Populations Index (TDPI)

<table>
<thead>
<tr>
<th>TDPI</th>
<th>Color</th>
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<tbody>
<tr>
<td>1.6 - 3.3</td>
<td>Green</td>
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<tr>
<td>1.4 - 1.6</td>
<td>Teal</td>
</tr>
<tr>
<td>1.3 - 1.4</td>
<td>Blue</td>
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<tr>
<td>1.1 - 1.2</td>
<td>Light Blue</td>
</tr>
<tr>
<td>0 - 1.0</td>
<td>Light Gray</td>
</tr>
</tbody>
</table>
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
Service Area

Half-mile walkshed + frequent service area
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
How Pittburghers 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)
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.
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

Edgewood Ave, Edgewood Borough
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 Typicals**
  - 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
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 of consistent, and connected to the pedestrian path. Clear turning radius for wheelchair users. Sign should be located adjacent to the pad. Sign should be provided for both front and back (if there). Pad should be kept free from obstructions along the curb.

2. Street Furniture

3. Pedestrian Pathway

4. Bus Stop Location

5. Street Furniture

6. Pedestrian Pathway

7. Bus Stop Location

8. Street Furniture
Typical Improvement Types

BUS STOP IMPROVEMENTS

General Notes

- The following improvement types are recommended depending on on-road conditions and needs.
- A 25% ADA-compliant, firm and stable base/drainage system should be provided for all bus stops.
- A flexible, porous surfacing material shall be provided at each bus stop location.

General Notes

- All bus stops should be 5 feet in width.
- The distance between bus stops should be at least 500 feet to provide space for an ADA-protected area.

Bus stop improvements can be made on existing sidewalks or in new or existing streets.

Type 1: Shelter on Existing Sidewalk

- Shelters may be placed in sidewalks with sufficient width with or without additional space.
- Shelters must be at least 5 feet wide and 5 feet deep.
- Shelters should be 5 feet in width and 5 feet in depth.

Type 2: Shelter on Widened Sidewalk

- On narrow sidewalks, a new shelter may be required to provide a minimum width of 6 feet.
- New shelters should be at least 5 feet deep.

Type 3: Planting Strip Infill Slab

- Planting strip infill slab provides space to accommodate a continuous form and stable connection to sidewalks.

Type 7: Boarding Bulb Dimensions and Design Details

- The table below shows the length of curbs needed to accommodate different bus sizes.

- For 60' buses, the minimum length is 4'6".
- For 40' buses, the minimum length is 3'6".
- For 30' buses, the minimum length is 2'6".

- The dimensions should be adjusted as necessary to accommodate different bus sizes.

- The dimensions should be adjusted as necessary to accommodate different bus sizes.

- The dimensions should be adjusted as necessary to accommodate different bus sizes.

- The dimensions should be adjusted as necessary to accommodate different bus sizes.

- The dimensions should be adjusted as necessary to accommodate different bus sizes.
T.O.D. Guidelines
Guide to best practices for transit-oriented development and supporting policies.
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

- CAPTAIN: Informs citizens of where the rail is, and how to use the transportation system.
- Pedestrian Tools and Transit:
  - CAPTAIN: Conducts foot traffic surveys to analyze pedestrian traffic patterns.
  - CAPTAIN: Conducts foot traffic surveys to analyze pedestrian traffic patterns.
- Transit Planning:
  - CAPTAIN: Provides recommendations for improving pedestrian access, including prioritization of PRT stations with the most need.

A. CAPTAIN:
- CAPTAIN: Provides recommendations for improving pedestrian access, including prioritization of PRT stations with the most need.

B. CAPTAIN:
- CAPTAIN: Provides recommendations for improving pedestrian access, including prioritization of PRT stations with the most need.

C. CAPTAIN:
- CAPTAIN: Provides recommendations for improving pedestrian access, including prioritization of PRT stations with the most need.

D. CAPTAIN:
- CAPTAIN: Provides recommendations for improving pedestrian access, including prioritization of PRT stations with the most need.

E. CAPTAIN:
- CAPTAIN: Provides recommendations for improving pedestrian access, including prioritization of PRT stations with the most need.

F. CAPTAIN:
- CAPTAIN: Provides recommendations for improving pedestrian access, including prioritization of PRT stations with the most need.

G. CAPTAIN:
- CAPTAIN: Provides recommendations for improving pedestrian access, including prioritization of PRT stations with the most need.

H. CAPTAIN:
- CAPTAIN: Provides recommendations for improving pedestrian access, including prioritization of PRT stations with the most need.

I. CAPTAIN:
- CAPTAIN: Provides recommendations for improving pedestrian access, including prioritization of PRT stations with the most need.

J. CAPTAIN:
- CAPTAIN: Provides recommendations for improving pedestrian access, including prioritization of PRT stations with the most need.

K. CAPTAIN:
- CAPTAIN: Provides recommendations for improving pedestrian access, including prioritization of PRT stations with the most need.
Questions?

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Craig Toocheck
ctoocheck@rideprt.org

Links
• DOMI Complete Streets Program
• PRT Projects & Programs
• PRT Surveys & Reports
  (including guidance documents)