

APPENDIX C:

PASSENGER RAIL MULTIMODAL CONNECTIVITY ANALYSIS AND CANDIDATE IMPROVEMENTS

Overview

This memorandum presents a multimodal connectivity analysis, identification of gaps in the multimodal network, and candidate access improvements for the fourteen passenger rail stations that are served by Amtrak Cascades in Portland, Oregon; Washington; and Vancouver, British Columbia Canada. Additionally, system-wide candidate improvements are identified that are applicable to other Amtrak rail stations in Washington. Multimodal connectivity to these rail stations can enhance the passenger experience, may attract additional riders to intercity passenger rail, and increases the capacity for access to the stations without the need to increase the parking supply. This analysis focuses on alternatives to single-occupant vehicle (SOV) access and does not evaluate opportunities to increase the parking supply, manage parking demand, or make improvements to the roadway network for SOV access to intercity passenger rail.

An analysis of existing conditions at these stations (summarized in the memorandum, 7.1.b Amtrak Cascades Rail Stations Existing Conditions Memo), served as the foundation for the connectivity analysis. Additionally, the results of an on-board survey of the travel behavior of Amtrak Cascades passengers provided insights to inform both the connectivity analysis and the candidate access improvements (summarized in the memorandum, 2.3.5 Final Amtrak Cascades Onboard OD Survey Memorandum).

As used in this memorandum, “connectivity” refers to the collective influence of land use and transportation factors on the options for passengers to access or leave the rail stations. The connectivity analysis evaluates station area land use context, availability of transportation services, and station area transportation infrastructure to identify the strengths and weaknesses of existing station access. Data was collected with respect to ten evaluation measures, which were then rated and aggregated to create access scores for land use, mobility options, connectivity, and ultimately an overall access score for each station. Gaps and significant variations in station accessibility were used to identify candidate access improvements. The connectivity factors evaluated for the State Rail System Plan Update are similar to the “access to transit” elements of the Regional Transit Access and Parking Strategy identified in the Puget Sound Regional Council’s 2018 [Regional Transportation Plan](#).

Summary folios for each station are included as attachments to this memorandum. The station folios include: key information from the existing conditions analysis; a narrative overview of the station context and multimodal access; a quantified connectivity analysis that yields an access “score” for each station; candidate improvements; and photo documentation to present a complete picture of the current status and potential future of multimodal access to the station.

Key findings from the on-board passenger survey

More than 1,000 Amtrak Cascades passengers were surveyed in July 2018 to gather information about travel origins & destinations; trip purpose; mode of access to stations; frequency of Amtrak Cascades use; and reasons for using Amtrak Cascades. Key findings from the survey were:

- Most respondents came from someplace other than work or home (49%), or they came from home (46%) before getting on the train.
- It took most participants (73%) 30 minutes or less to get to the train station.
- Nearly a third (31%) of participants were dropped off at the train and another quarter (25%) took an Uber or Lyft there.
- Most respondents boarded the train in Portland (36%) or Seattle (27%).
- About 70% of respondents' final destination was Portland (40%) or Seattle (29%).
- Half (50%) of respondents took this trip to visit friends and relatives.
- Most (60%) respondents were traveling alone.
- Most (54%) respondents were not frequent riders (rode less than once per month), and a third (34%) were first-time Amtrak Cascades riders.
- Most respondents ride Amtrak Cascades to avoid traffic (60%) and/or to be able to do other things like read or sleep (56%).
- Most respondents were either first time Amtrak Cascades riders (38%) or have been riding Amtrak Cascades for more than 5 years (32%).

Overview of evaluation criteria and measures

Based on the information from the existing conditions analysis and the passenger survey, three categories of influence were identified as key connectivity considerations:

1. Land Use
2. Mobility
3. Connected Transportation System

These evaluation categories are described further below.

Land use

The land use context of each passenger station is an important influence on station access mode choice. Stations located in a mixed-use or urban context are likely to be close enough to trip generators such as employment centers, residential density, or cultural/recreational opportunities to be within walking distance or accessible via a relatively short trip via transit, taxi or rideshare. Land use evaluation measures included both the zoning and land use context and the presence of the “attractors,” as described further in Table 1 below.

Mobility

The availability of mobility options, such as transit service to stations or station areas, access to services such as Uber and Lyft (transportation network companies) and services provided for people with mobility impairments or economic barriers to travel (paratransit and human services transportation providers) are important influencers on mode of access that is included in the connectivity evaluation. The availability of parking for private automobiles is also addressed in the analysis of existing conditions.

Connected transportation network

Finally, the transportation infrastructure within station areas is an important influence on mode choice. This category was measured based on the sidewalk and bicycle network serving station areas; the presence of railroad crossings as a potential barrier to station access; and the quality of wayfinding (directional information/signage) at stations and station areas. Other barriers to station access, such as highways that impact the connectivity of the street network, are also noted in the station overview narratives.

Connectivity analysis: methodology

The connectivity analysis featured the development of an overall connectivity “score” for each station that considers the quantitative and qualitative evaluation of the measures. The evaluation and scoring methodologies are described in Exhibit C-1 and Table 1 below.

Figure-1: Connectivity Analysis Methodology

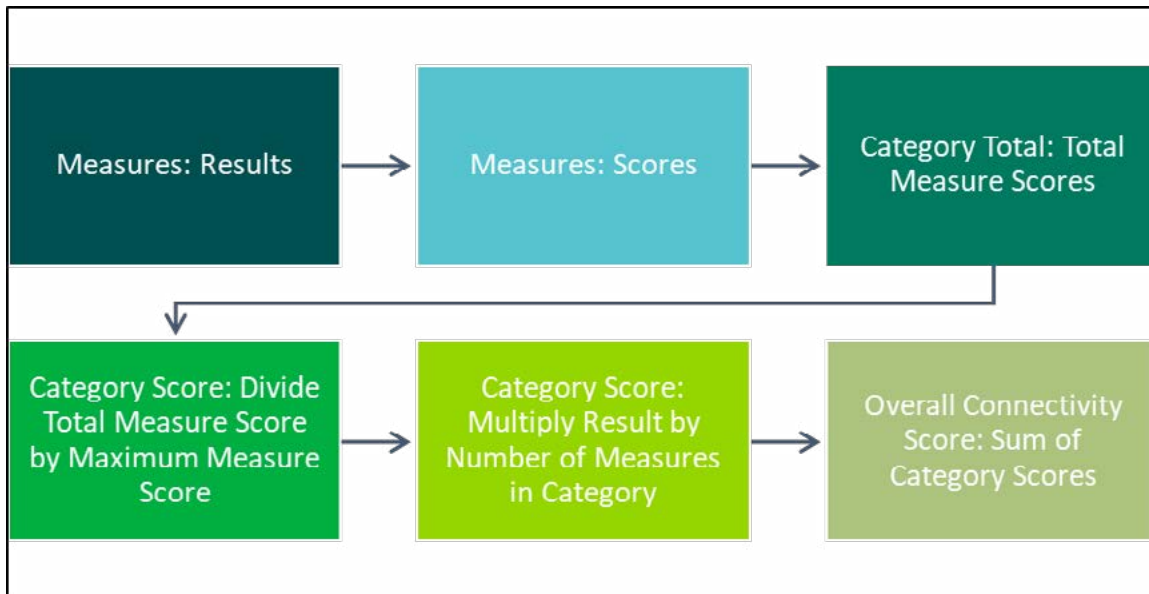


Table 1. Multimodal analysis evaluation categories, measures, data sources & scoring methodology

Category	Measure	Source of data	Scoring methodology	High	Low
Land use	Station context	Google maps & field assessment	The land use context within the station area was evaluated based on the predominant land use (such as Urban Center/Main Street; Industrial; Rural) and the quantity of trip generators/attractors within 3/4 mile of the station (such as, parks, hospitals, colleges, convention facilities, event facilities, and cultural facilities). The evaluation was scored as follows: 3 Points: Urban or “Main Street” Settings with Significant Attractors; 2 Points: Settings with Significant Attractors but Fewer Supportive Land Uses 1 Point: Rural Setting 0 Points: Industrial Setting	3 points = Urban or “Main Street” Setting with Attractors	0 points = Industrial
	Zero-car households	Census	Zero-car households were geospatially mapped and then reviewed for density of zero car households in census blocks within a 3/4-mile radius of the station. The evaluation was scored as follows: Surrounding census tracks with low vehicle availability (over 20% zero car households) = 3 points. Surrounding census tracks with medium vehicle availability (5 to 20% zero-car households) = 2 points. Surrounding census tracks with high vehicle availability (0 to 5% zero-car households) = 1 point.	3 points = High number of zero car households	1 point = Low number of zero car households
Mobility	Transit service	WSDOT station asset inventory and local transit agency schedules	The number of connecting transit routes (bus, commuter rail, street car, ferries, and light rail) within a 1/2 mile. The evaluation was scored as follows: 3 points: over 12 transit connections 2 points: 5 to 11 transit connections 1 point: up to 4 transit connections	3 points = 12 or more transit connections	1 point = Up to 4 transit connections
	Private transportation connection options	Field assessment	The number of private transportation connection options ¹ (Uber/Lyft, bike share/scooter share) within a 1/2 mile were identified and assigned 0 to 3 points based on quantity.	3 points = 4 or more options	1 point = 0 to 2 options
	Human services transportation	Statewide and Metropolitan Planning Organization human service transportation plans	Human Service Transportation Plans were reviewed for 3 factors: if travel training is part of the plan; does the plan include Amtrak Cascades; and what lead time is required to fulfill a request for paratransit services. Results were totaled and points are between 1 and 3.	3 points = 3 factors	1 point = 1 factor

¹ The number of options is evaluated based on the availability of each option near the station area. If one type of service is available, it is counted as 1, otherwise as 0. The number of options indicates the sum of total available options. 0 to 2 options is assigned to 1 point; 3 options is assigned to 2 points, and 4 or more is assigned to 3 points.

Table 1. Multimodal analysis evaluation categories, measures, data sources, & scoring methodology (continued)

Category	Measure	Source of data	Scoring methodology	High	Low
Connected transportation network	At-grade railroad crossings	WSDOT (from local cities/ towns) and Parsons	The number of pathways that require an at-grade railroad crossing within a 1/2 mile of the station was identified. Scores are inverse to the number of at-grade crossings, with the maximum of three points assigned when there are no at-grade crossings.	3 points = 0 crossings	0 = 3 or more crossings
	Sidewalks	WSDOT station asset inventory and field assessment	Sidewalks were geospatially mapped within a 1/4-mile radius of the station and assigned 0 to 3 points based on coverage and connectivity of sidewalks to the station, based on review of GIS data and site visits.	3 points = "High" (Station fully connected to sidewalk network)	1 point = "Low" (Sidewalks are missing on routes that connect directly to station)
	Bicycle Facilities	WSDOT station inventory, field assessment & local/ regional bicycle plans	Bicycle facilities were geospatially mapped within a 1/2-mile radius of the station and assigned 0 to 3 points based on the coverage and connectivity of bicycle facilities connecting to station area, based on review of GIS data and site visits.	3 points = "High" (Station fully connected to bicycle network)	1 point = "Low" (Bicycle facilities are missing on routes that connect directly to station)
	Drop-off/pick-up areas	Field assessment	The drop-off/pick-up areas were assessed for signing, striping and designated ADA areas and assigned 0 to 3 points based on the number of these factors achieved.	3 points = meets all three factors	1 point = meets only one factor
	Wayfinding	Field assessment	Wayfinding was assessed for: branded Amtrak presence at station; wayfinding signs at the station, and wayfinding signs in the vicinity, and assigned 0 to 3 points based on the number of these factors achieved.	4 points = meets all three factors	2 point = meets only one factor

A sample connectivity evaluation for the Vancouver, Washington station is shown in Table 2. The table includes the evaluation categories and measures, the maximum points available in each category and the maximum score (which is equal to the number of measures in the category), the points assigned based on the evaluation results, and the score achieved, which was calculated as:

$$(\text{points assigned}/\text{maximum points}) * \text{measures}$$

Table 2. Sample Connectivity Evaluation:		Vancouver, WA			
Categories & measures		Maximum points	Maximum score	Points	Score
Measures					
LAND USE	2	6	2	4	1.3
Station location context & attractors		3		1	
Zero car household		3		3	
MOBILITY	3	9	3	3	1.0
Transit service		3		0	
Private transportation connection options		3		1	
Human services transportation		3		2	
CONNECTED TRANSPORTATION NETWORK	5	15	5	5	1.7
At-grade railroad crossings		3		1	
Sidewalks		3		1	
Bicycle facilities		3		1	
Drop-off/pick-up areas		3		0	
Wayfinding		3		2	
Station connectivity - TOTAL	10	30		12	4.0

The connectivity evaluations were completed for each of the Amtrak Cascades stations and are included in the attached station folios.

Key findings: connectivity

Significant improvements to connectivity are planned at several of the station areas, particularly those within the Sound Transit (Central Puget Sound Regional Transit Authority) district in sections of King, Pierce and Snohomish counties; or in other major metropolitan areas (Portland, Oregon/Vancouver, Washington; Vancouver, British Columbia).

At most station areas, significant changes to land use designations are not anticipated. Vancouver, Washington’s waterfront redevelopment plans could have an influence on the land use context of the Vancouver Station. The built environment within the Tacoma and Everett station areas is likely to evolve as a result of the influence of regional light rail transit to these station areas. These potential changes are likely to come near the end of or beyond the planning horizon for the State Rail Plan (2040).

Table 3 provides a summary overview of connectivity evaluation of the Amtrak Cascades stations.

Table 3. Summary of Amtrak Cascades Station Connectivity Analysis

	Station	Land Use	Mobility	Connected Transportation Network	Connectivity
1	Portland, OR	●	●	●	●
2	Vancouver, WA	●	●	●	●
3	Kelso-Longview	●	●	●	●
4	Centralia	●	●	●	●
5	Olympia-Lacey	●	●	●	●
6	Tacoma	●	●	●	●
7	Tukwila	●	●	●	●
8	Seattle	●	●	●	●
9	Edmonds	●	●	●	●
10	Everett	●	●	●	●
11	Stanwood	●	●	●	●
12	Mount Vernon	●	●	●	●
13	Bellingham	●	●	●	●
14	Vancouver, BC	●	●	●	●
Maximum Score		2	3	5	10
Legend					
Low Score		●			
Medium Score		●			
High Score		●			

Overview of candidate station access improvements

Methodology

The connectivity analysis categories and evaluation measures used to generate a connectivity score for each of the Amtrak Cascades passenger rail stations were used with the information from the memorandum, 7.1.b Amtrak Cascades Rail Stations Existing Conditions Memo to identify gaps in the station area that affect mobility. Candidate improvements were then developed to guide the identification of opportunities for improvement for each of the measured influences on station mode of access choices. The resulting set of system-wide candidate improvements have the potential to enhance connectivity to any of the Washington Amtrak passenger rail stations. For each of the Amtrak Cascades stations included in this evaluation, the existing conditions analysis and connectivity scores were used to identify potential station-specific application of the system-wide candidate improvements.

System-wide candidate improvements

Typical strategies and investments that could be applied to improve multimodal access at any intercity passenger rail station in the state of Washington are identified in Table 5. Where applicable, location-specific candidate improvements for stations served by Amtrak Cascades are identified in the station folio attachments to this memorandum.

WSDOT will work with stakeholders to improve access and connectivity to Amtrak Cascades stations. Local jurisdictions, transit agencies, Amtrak and railroads could consider addressing these opportunities when implementing their capital improvement and service development plans. Some of the opportunities identified also may be addressed in these existing plans.

Table 5. Systemwide candidate improvements

Categories & measures	Candidate improvements - systemwide
LAND USE	
Station location context & attractors	Local jurisdictions may have opportunities to modify land use regulations near station areas to allow or encourage transit-oriented uses. Local jurisdictions and institutions may have opportunities to encourage site uses/ facilities that are transit and multimodal attractors near stations through economic development efforts.
Zero-car households	Local jurisdictions could prioritize multimodal improvements in the areas that have households with low vehicle availability, recognizing that these areas present opportunities to maximize non-SOV access to stations.
MOBILITY	
Transit service	Local transit agencies may have funded or un-funded plans to provide additional transit service to station areas, which may include additional routes, increased frequency, extended span of service, and coordination of schedules. Local agencies and WSDOT can encourage local transit agencies to connect service to Amtrak Cascades passenger stations.

Table 5. Systemwide candidate improvements

Categories & measures	Candidate improvements - systemwide
Private transportation connection options	Local jurisdictions may have opportunities to allow private transportation providers to serve station areas.
Human services transportation	WSDOT could identify recommended best practices for Human service transportation plans/providers serving station areas, such as travel trainings for targeted groups.
CONNECTED TRANSPORTATION NETWORK	
At-grade railroad crossings	WSDOT and local jurisdictions may have the opportunity to work with the railroads to coordinate railroad crossing improvements that include: signing, striping, ADA compliance, sidewalks, grade separated structures for pedestrian/bicycle use, upgrade warning devices, enhance crossings, etc.
Sidewalks	Local jurisdictions could prioritize sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations within their capital improvement plans and long-range plans.
Bicycle facilities	Local jurisdictions could prioritize bicycle facility improvements within 1/2-mile radius of stations within their capital improvement plans and long-range plans.
Drop-off/pick-up areas	WSDOT, Amtrak, other owners of stations and/or local jurisdictions could enhance signs and markings to designate or more clearly identify existing designated areas for drop-off/pick-up, either on-site or on-street at station areas.
Wayfinding	WSDOT, Amtrak, other owners of stations/and or local jurisdictions could complete wayfinding analysis and install additional wayfinding at stations, station vicinity, and station access routes.

Station-level gaps and candidate improvements

The attached station folios for Amtrak Cascades passenger rail stations identify gaps in the multimodal network and candidate improvements at the station level that may help to address these gaps. In many cases, local agencies (municipalities, transit agencies and other jurisdictions within station areas) may have more detailed land use, transportation and capital improvement plans that may serve as a source of candidate projects.

Definitions of terms used in this technical memorandum

Built environment: Per the U.S. Environmental Protection Agency, “The built environment touches all aspects of our lives, encompassing the buildings we live in, the distribution systems that provide us with water and electricity, and the roads, bridges, and transportation systems we use to get from place to place. It can generally be described as the man-made or modified structures that provide people with living, working, and recreational spaces.”

HAWK: A HAWK beacon (High-Intensity Activated crossWalk beacon) is a traffic control device used to stop road traffic and allow pedestrians to cross safely. The purpose of a HAWK beacon is to allow protected pedestrian crossings, stopping road traffic only as needed. At certain locations, the signal can automatically detect the presence of pedestrians waiting to cross and will activate the signal.

Leading pedestrian interval: A leading pedestrian interval (LPI) typically gives pedestrians a 3–7 second head start when entering an intersection with a corresponding green signal in the same direction of travel. LPIs enhance the visibility of pedestrians in the intersection and reinforce their right-of-way over turning vehicles, especially in locations with a history of conflict (source: National Association of City Transportation Officials, Urban Street Design Guidelines).

Mixed-use: Mixed-use is development that blends a combination of residential, commercial, cultural, institutional, or industrial uses, where those functions are physically and functionally integrated.

Multi-use path: Also known as a shared use path; a path that is intended to accommodate both cyclists and pedestrians and is physically separated from motor vehicular traffic with an open space or barrier.

Other station elements: Other station elements are comprised of grade separated pedestrian crossings, parking areas, auto pick-up/drop-off areas, bus pick-up/drop-off areas, and pedestrian at-grade railroad crossings. Figures that present these individual elements at each station area are provided in the December 13, 2018 memorandum, Amtrak Cascades Rail Stations Existing Conditions Memorandum with Station Report Cards.

Transportation network company (TNC): Transportation network companies (TNC) are ride hailing or ride sharing companies that are supported by a computer or mobile application to connect passengers with drivers. Lyft and Uber are examples of TNCs.

Bike share: Bike share is another shared mobility option that provides bicycles on a shared use basis for customers to use for a fee that is usually determined by time of use or mileage. Bike share systems can be owned and operated by public agencies and private companies. Originally, many bike share systems required a docking system, a specific location where to unlock and lock bikes, but today’s location system technology provides many options for dockless systems.

Human services transportation plan: Human services transportation plans are federally required and can be “prepared through a process consistent with the applicable metropolitan or statewide planning process. The Coordinated Public Transit-Human Services Transportation Plan means a locally developed, coordinated transportation plan that identifies the transportation needs of individuals with disabilities, seniors and people with low incomes, provides strategies for meeting those needs, and prioritizes transportation services for funding and implementation.” For more information, see:

https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/C9070_1G_FINAL_circular_4-20-15%281%29.pdf

Bicycle Facilities: Bicycle facilities are used in this technical memorandum to include any type of: bike route, bike boulevard, bike lane, buffered bike lane, protected one- or two-way bike lane/cycle track, bike box, two-stage turn queue bike box, shared-use path, multi-use path/trail, underpass/bridge.

Portland, Oregon

Union Station
 800 NW 6th Ave
 Portland, OR 97209

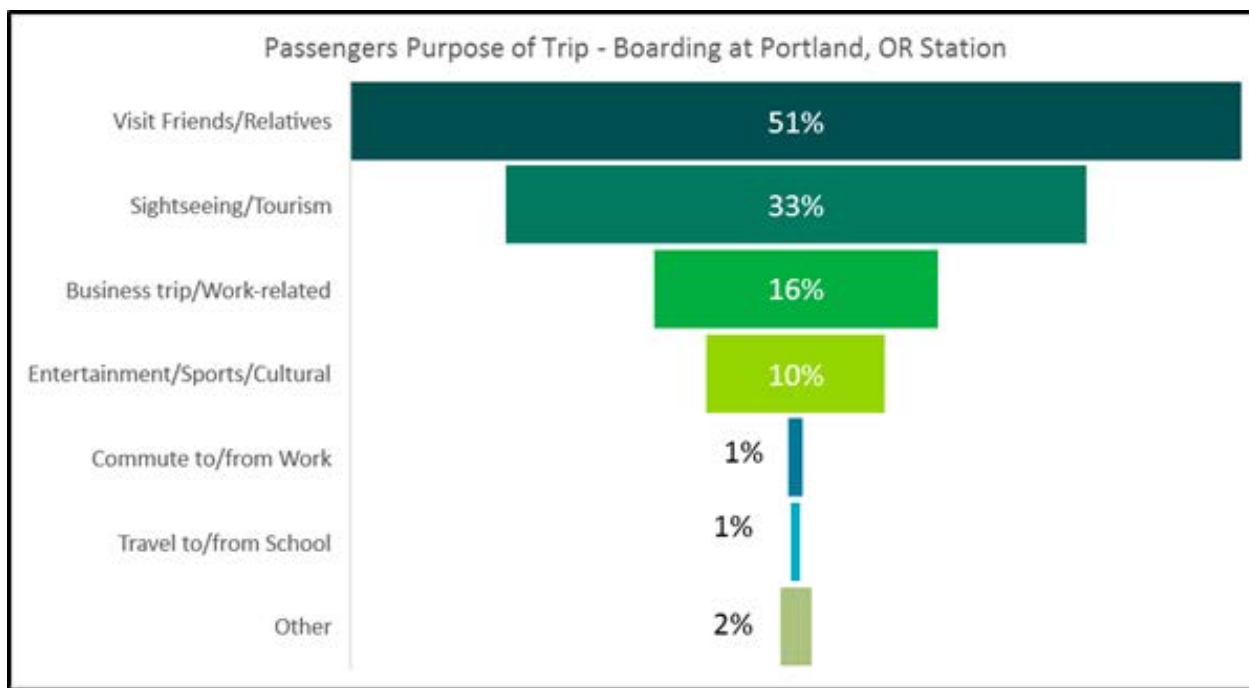


Station overview

Union Station in Portland, Oregon is an iconic station that is connected within a short walking distance to multiple transit options that include: bus, long-distance bus routes, street car and light rail routes. The station is located in an active part of Old Town/Chinatown and is adjacent to the Willamette River. The station is owned and maintained by the City of Portland.

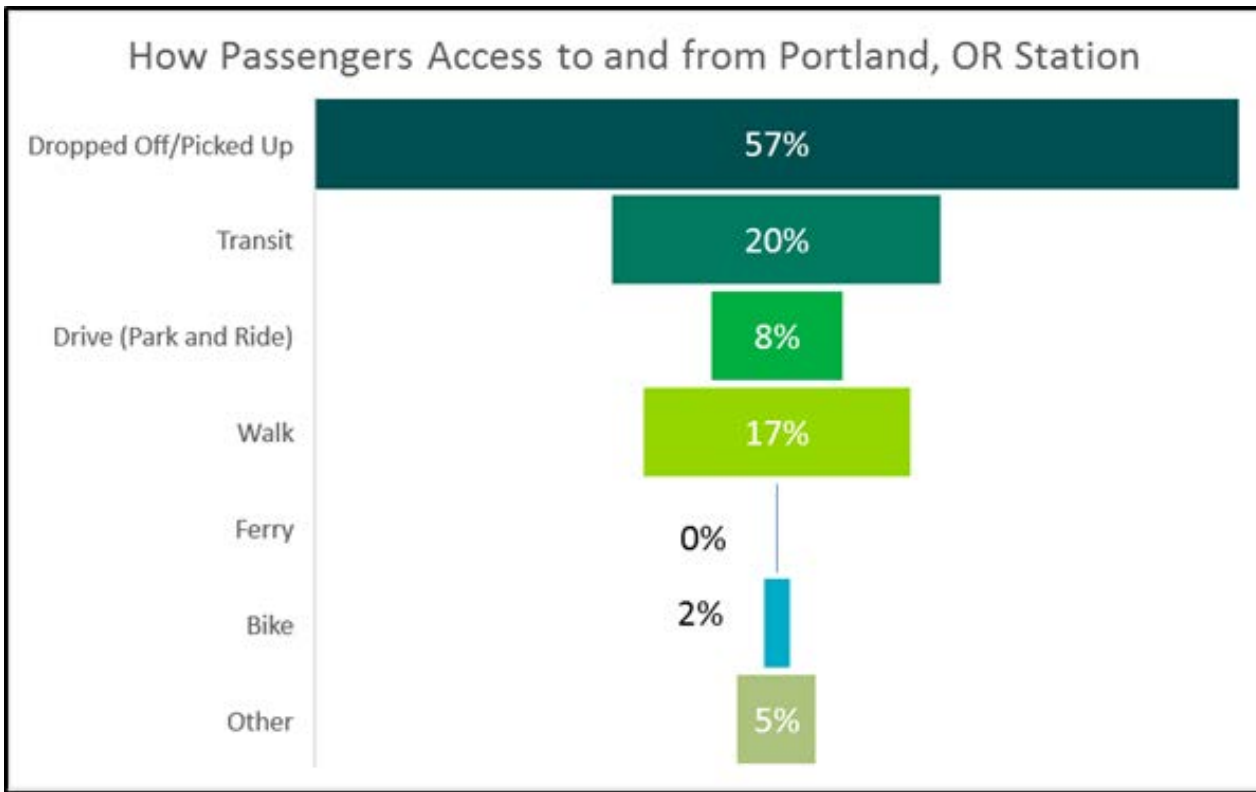
Union Station served approximately 412,000 passengers in 2017. Trip purpose and mode of access data gathered from a 2018 on-board passenger survey is summarized in Figures 1 and 2. (The on-board survey reached over 1,000 Amtrak Cascades passengers, producing statistically significant results for the corridor. However, at the station level, results may not be statistically significant, particularly at stations with lower ridership.)

Figure-2: Survey Results-Trip Purpose



Note: Survey respondents had the option of selecting more than one response.

Figure-3: Survey Results-Mode of Access



Note: Survey respondents had the option of selecting more than one response.

Parking and drop-off/pick-up

Union Station offers a surface parking lot with 25 short term (paid) parking spaces, 100 long term (paid) parking spaces, and dedicated accessible parking spaces. The station features a clearly delineated pick-up/drop-off area with a dedicated taxi stand. No specific accommodation in the pick-up/drop-off area has been made for transportation network companies or human services transportation providers.

Walk and transit access

From a pedestrian standpoint, Portland Union Station is highly integrated into the pedestrian and transit environment. From the primary station entrance to 6th Avenue, the sidewalk network surrounding the station appears complete. The primary impediment to pedestrian travel is the railroad tracks themselves. This is mitigated by a pedestrian overpass connecting the station area to Naito Parkway.

Within Union Station, important services are indicated with historical neon signage. However, pedestrian orientated wayfinding signage surrounding the station is minimal, especially given the proximity of TriMet light rail, the Portland Streetcar and the Greyhound Terminal. There are several wayfinding signs oriented towards automobile travel, guiding drivers to the station.

Several alternative modes of travel are available at or near Portland Union Station. TriMet light rail is accessible within a block of the station itself. TriMet light rail has direct connection to Portland International Airport, the primary passenger air connection in Oregon. There are also nearby Portland Streetcar stops. The Greyhound terminal is located on an adjacent block to Union Station.

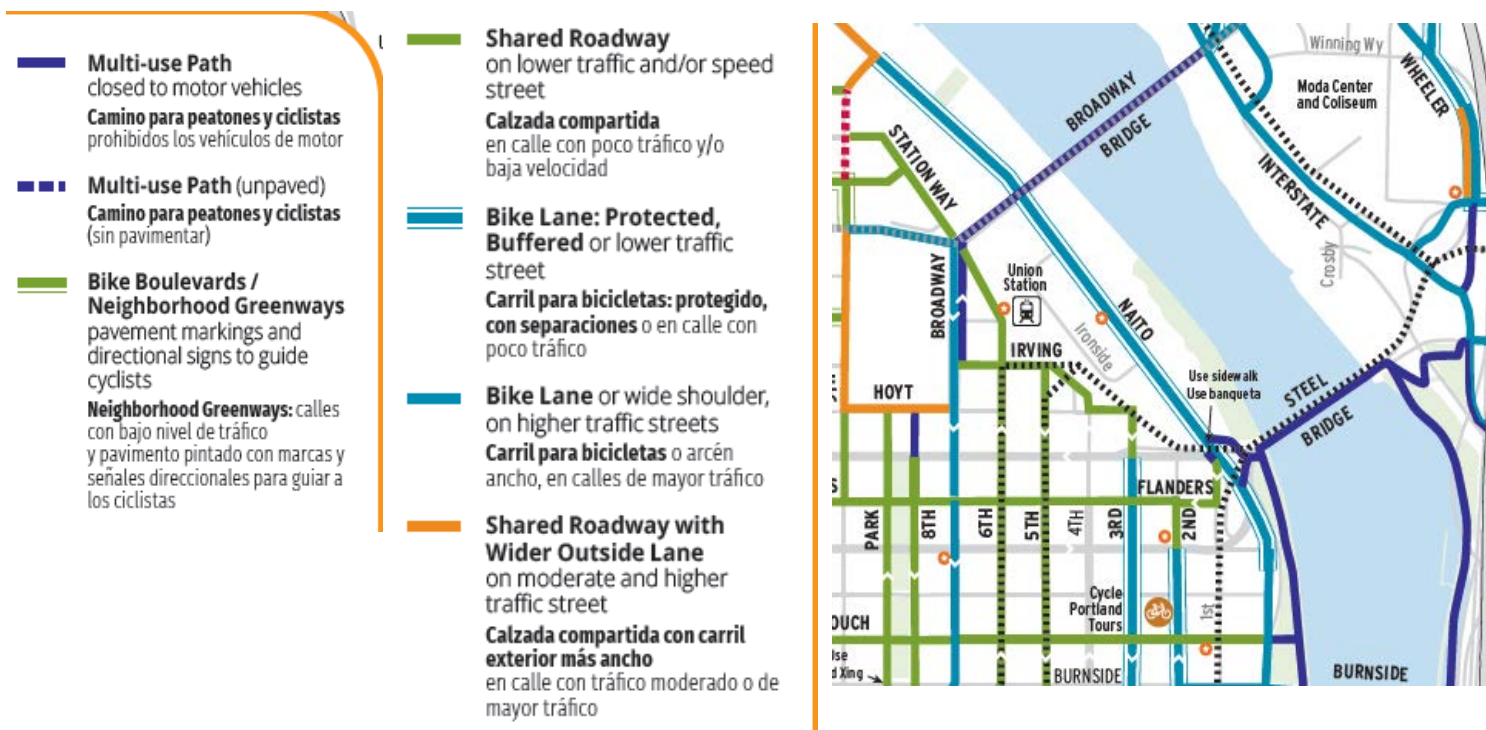
Bicycle access

While the City of Portland has substantial bicycle infrastructure, most of the streets surrounding Portland Union Station do not have any bicycle specific improvements. A notable exception is the adjacent Broadway Bridge over the Willamette River and its approaches. There is bike parking (racks) at Union Station. While there have been few improvements made to the immediate street network surrounding the station, these roads are generally low volume and connect to improved facilities within a few blocks. As a result, bicycle access to this station is high, and can be seen in Figure 3.

Portland Union Station Bicycle Connections

From PDX by Bicycle, 2017 from <https://www.portlandoregon.gov/transportation/39402>

Figure-4: Bicycle Facilities-Vicinity of Union Station



Connectivity analysis

As shown in Table 1, analysis of land use, mobility and transportation network measures for the Portland station yielded a connectivity score of 8.7, of a possible 10 points, indicating limited gaps in the existing connectivity of the station.

The station achieved high or medium sub-scores in all categories.

Table 1. Connectivity Evaluation: Portland

Categories & Measures	Measures	Maximum Points	Maximum Score	Points	Score
LAND USE	2	6	2	6	2.0
Station Location Context & Attractors		3		3	
Zero Car Household		3		3	
MOBILITY	3	9	3	7	2.3
Transit Service		3		2	
Private Transportation Connection Options		3		3	
Human Services Transportation		3		2	
CONNECTED TRANSPORTATION NETWORK	5	15	5	13	4.3
At-Grade Railroad Crossings		3		3	
Sidewalks		3		3	
Bicycle Facilities		3		3	
Drop-off/Pick-up Areas		3		2	
Wayfinding		3		2	
Station Connectivity - Total	10	30	10	26	8.7

Candidate improvements

Table 2. Opportunities to Enhance Connectivity at Union Station (Portland)

Type	Gaps	Candidate Improvement*	Potential Project Examples/ Locations*
Multimodal	Designated drop-off/pick-up area	Signage, striping, and additional designated drop-off/pick-up area for accessible/disabled transportation, either on-site or on-street at station areas	Improve signage and markings at station frontage
Multimodal	Wayfinding signs	Install additional wayfinding signs in station area	Locations to be determined
Pedestrian	Complete sidewalks (curb, gutter, ramps)	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	Sidewalk ramp upgrades to current accessibility guidelines

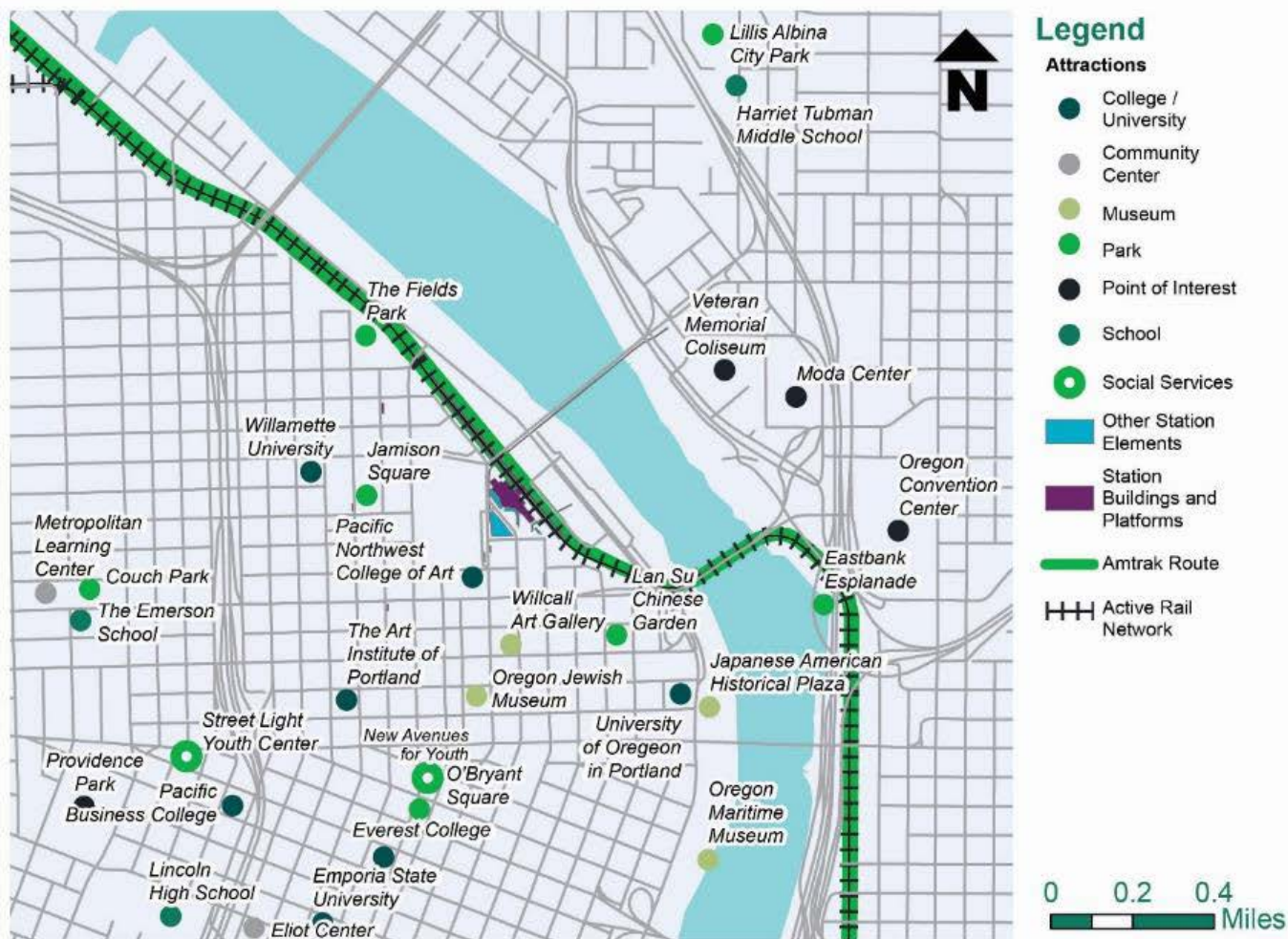
*Local jurisdictions, transit agencies, Amtrak and railroads could consider addressing these opportunities when implementing their capital improvement and service development plans; some of the opportunities identified may also be addressed in these existing plans.

Based on the results of the connectivity evaluation and the field visits, Figure 4 and Table 2 identify candidate pedestrian, bicycle, multimodal and railroad crossing improvements that can be expected to enhance connectivity to Union Station and promote increased safety for all travel modes. These candidate improvements, including potential project examples and/or locations, were identified based on the systemwide candidate improvement types, analysis of existing connectivity gaps, and site visits. These representative examples may include facilities owned by Amtrak, railroads or local agencies. Amtrak, railroads and local agencies can consider implementing improvements to their facilities and operations, similar to these representative examples, as they develop their capital improvement and service plans.

Supporting information - connectivity analysis

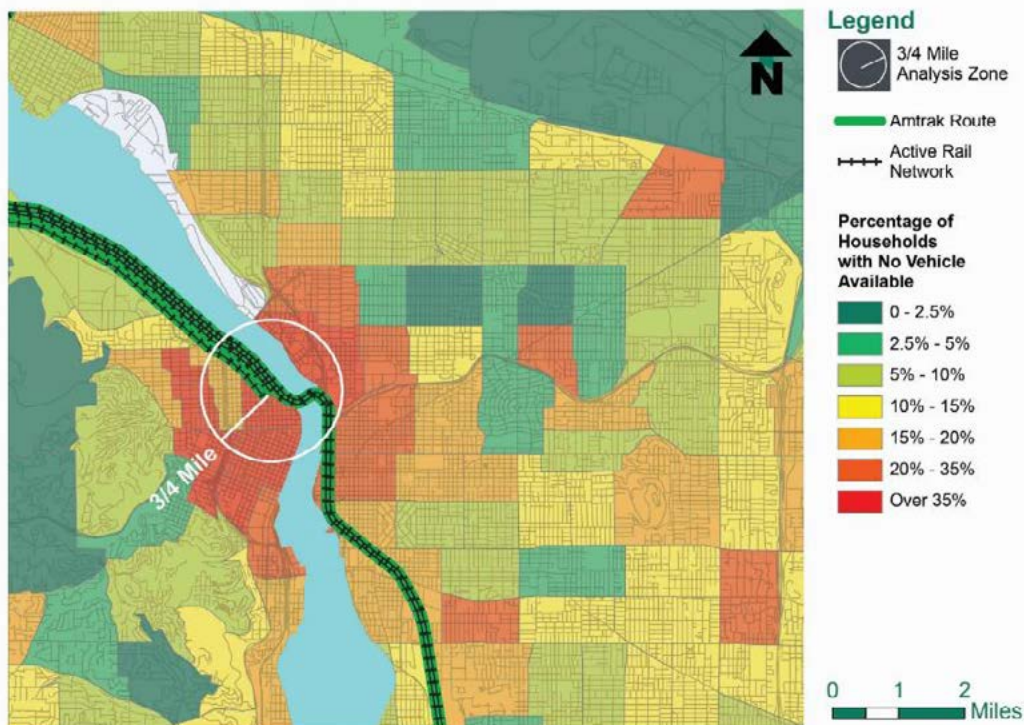
The summary results and connectivity score for the Portland station are supported by geospatial representations of four measured criteria (attractors, zero car households, sidewalks, and bicycle facilities) presented in the figures below and in Table C-1. Multimodal Connectivity Analysis: Observed Data & Assignment of Points.

Figure-5: Station Context-Attractors



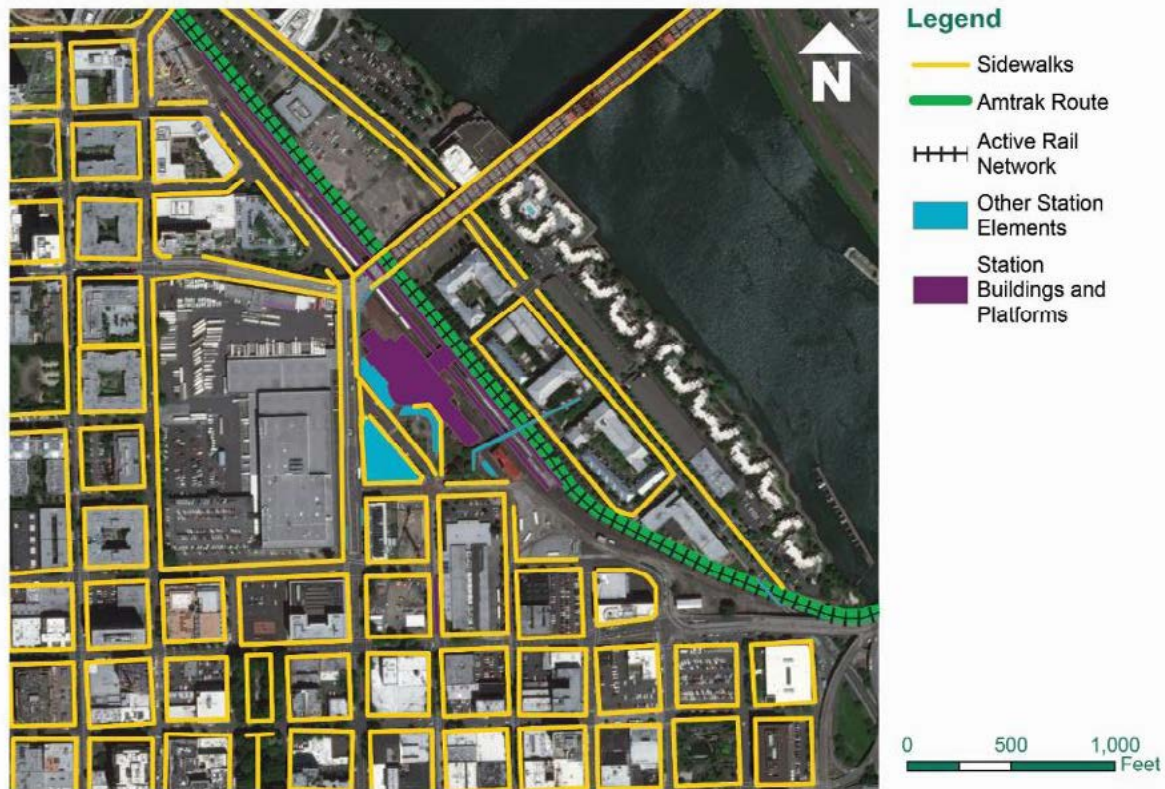
Portland (Union) Station Area Attractions

Figure-6: Zero-Car Households



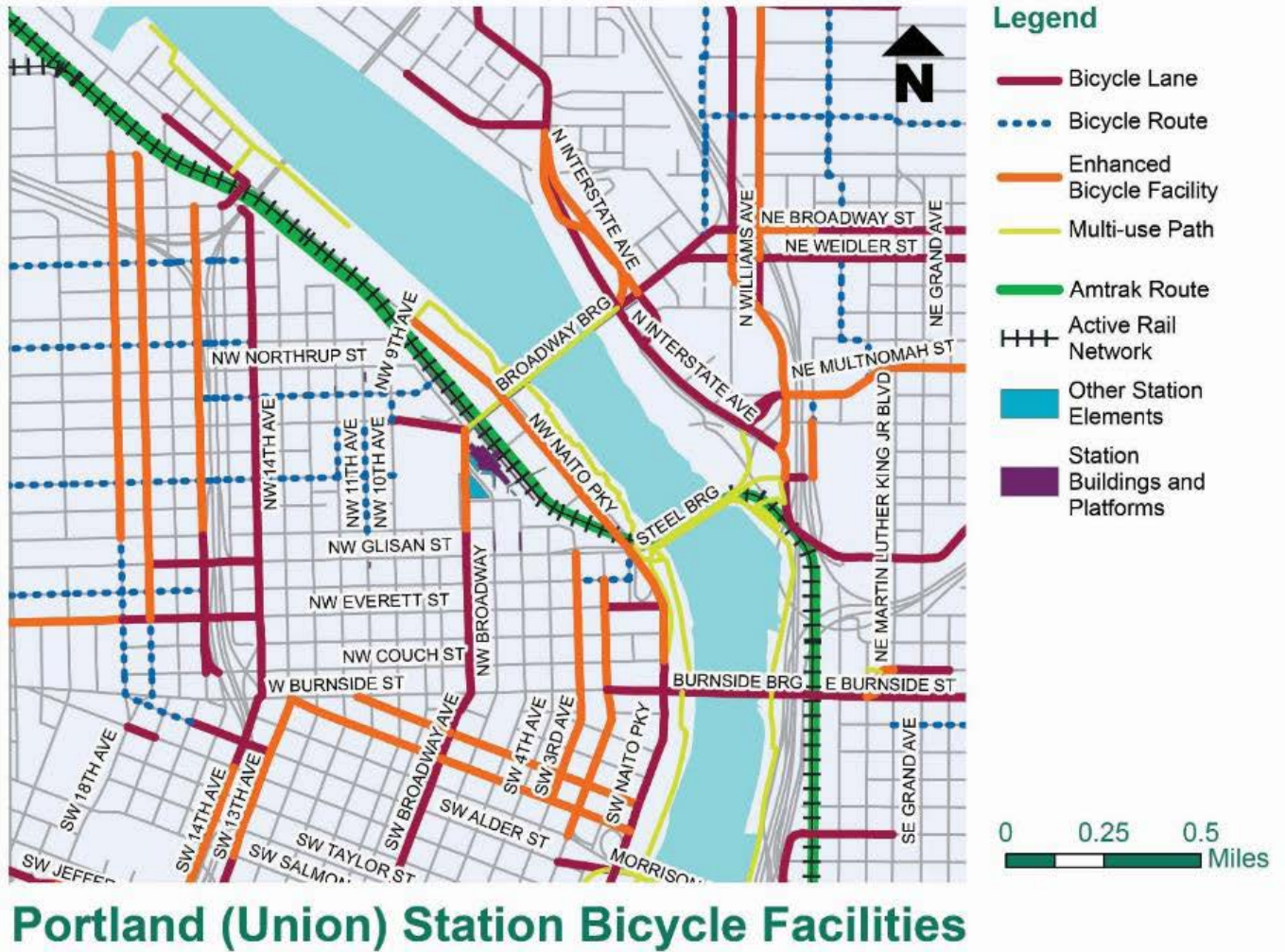
Portland (Union) Station Vehicle Availability by Household

Figure-7: Sidewalks



Portland (Union) Station Sidewalks

Figure-8: Bicycle Facilities



Supporting information - photo documentation

Site visits were conducted in Portland on October 10, 2018 to inventory assets at the station and assess multimodal connections.



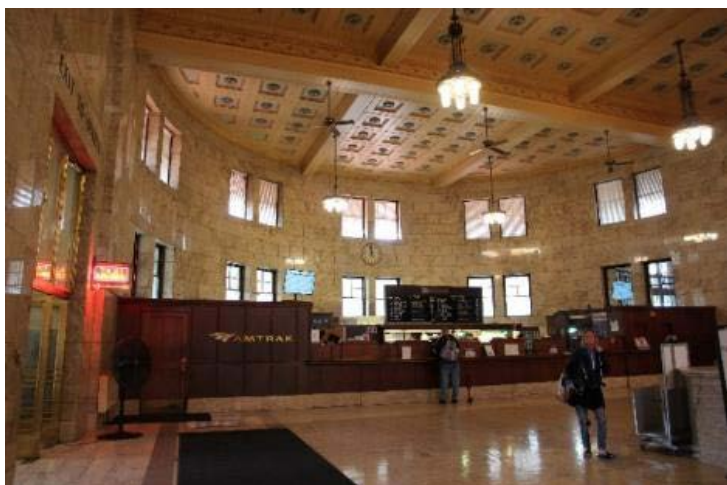
Pedestrian grade-separated crossing over station platforms.



Bikeshare station in front of train station



6th Ave & Hoyt St (northbound) TriMet Light Rail Station area adjacent to Union Station



Ticketing counter inside Union Station



Pick-up/drop-off zone in front of station. Note the taxi stand.



Amtrak red cap service provider

Vancouver, WA

Vancouver Station
 1301 West 11th Street
 Vancouver, WA 98660

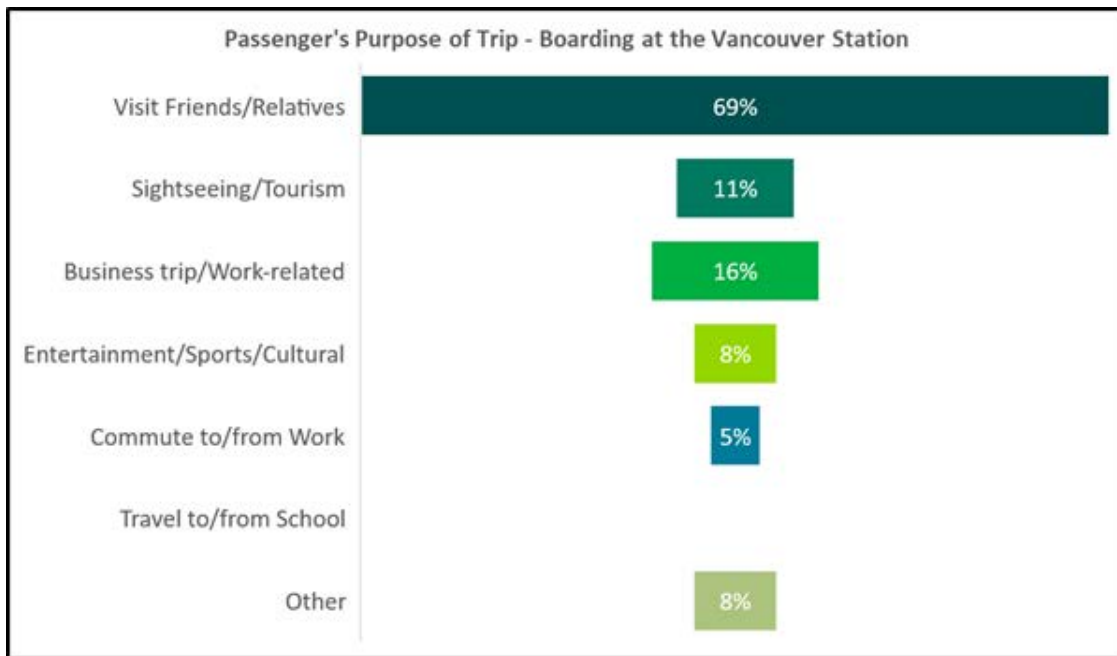


Station overview

Vancouver Station is located in a commercial and industrial area of Vancouver, Washington. The station, owned by the City of Vancouver, is located just over a half mile from the downtown area and within one mile of the Waterfront Development Project area, where private investors are adding jobs, restaurants, shops, housing, and a hotel next to the new Vancouver Waterfront Park that opened in September 2018.

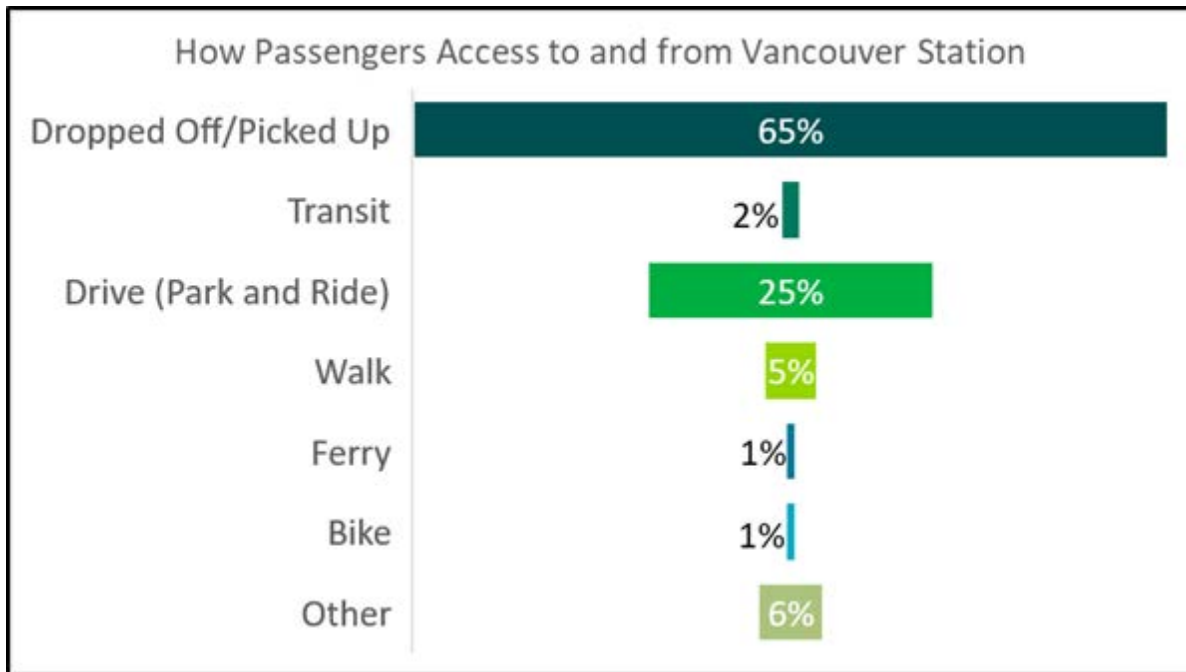
Vancouver Station served approximately 74,000 passengers in 2017. Trip purpose and mode of access data gathered from a 2018 on-board passenger survey is summarized in Figures 1 and 2. (The on-board survey reached over 1,000 Amtrak Cascades passengers, producing statistically significant results for the corridor. However, at the station level, results may not be statistically significant, particularly at stations with lower ridership.)

Figure-1: Survey Results-Trip Purpose



Note: Survey respondents had the option of selecting more than one response. No trips were recorded as travel to/from school.

Figure-2: Survey Results-Mode of Access



Note: Survey respondents had the option of selecting more than one response.

The location of the station, beyond an easy walking distance from the urbanized center city area, is a key factor in evaluating the accessibility of the station and identifying candidate improvements for improving connectivity. The station is surrounded by rail lines that see high volumes of trail traffic. As a result, access is frequently blocked by long, slow-moving freight trains transitioning from one route to another or entering/leaving the yard north of the station.

Parking and drop-off/pick-up

As noted on the Vancouver Station map and verified from field visits, the station does have a surface parking lot with 10 short term parking spaces and 45 long term parking spaces. The parking lot has dedicated accessible parking spaces. It does not have a clearly delineated area for drop-off/pick-up use (for taxi, transportation network companies, or human services transportation).

Walk and transit access

From a pedestrian standpoint, the Vancouver Station area has some deterrents. The two-main entry/exit points of the station are 11th Street and Hill Street. 11th Street does not have sidewalks on either side, nor are there any pedestrian improvements at the railroad crossing. Hill Street has a sidewalk on one side of the road, but the sidewalk ends about 450 feet away from the station when it connects to 8th Street.

The wayfinding signs are mainly oriented to people driving cars, with icons and arrows that indicate where to turn for the Amtrak station. There are wayfinding signs at the station for pedestrians, but the signs are placed in the parking lot and not connected to sidewalks.

The primary transit provider in Vancouver, Washington is C-Tran. While several C-Tran routes terminate near the Vancouver Courthouse, approximately ½-mile from the Vancouver Amtrak station, no buses stop in the immediate station area.

Bicycle access

Like the walkability near this station, there are no bicycle facilities connecting to the station. It is noted in the Cycling the City of Vancouver bike map that 11th Street is a 'Shared Roadway/Difficult Connection' that has lower traffic street with sight distance limitation and higher speeds. From the City's bike map, there are a limited number of nearby streets that have bicycle lanes. Additionally, the station does not have bicycle parking (racks or lockers) available. Bicycle access to this station is shown in Figure 3.

Figure-3: Station Area Bicycle Facilities

- **Paved Multi-use Paths**
Closed to motor vehicles
- **Shared Roadway**
On lower traffic street
- **Bike Lanes**
Or wide shoulders, usually on higher traffic streets
- **Shared Roadway with Wider Outside Lane**
On moderate and higher traffic street
- - - **Difficult Connection**
In areas with higher speeds and/or volumes, combined with narrow lane widths or other problems for cyclists
- - - **Shared Roadway/Difficult Connection**
Lower traffic street with sight distance limitations and higher speeds
- - - **Unpaved Multi-use Paths**
Closed to motor vehicles
- - - **Cyclists Prohibited**
Bicyclists are prohibited on some portions of interstate freeway road surfaces
- - - **Planned Bikeways**
Funded in the next year
- **Major Streets**



Connectivity analysis

As shown in Table 1, analysis of land use, mobility and transportation network measures for the Vancouver station yielded a connectivity score of 4.0, of a possible 10 points, indicating significant gaps in the existing connectivity of the station.

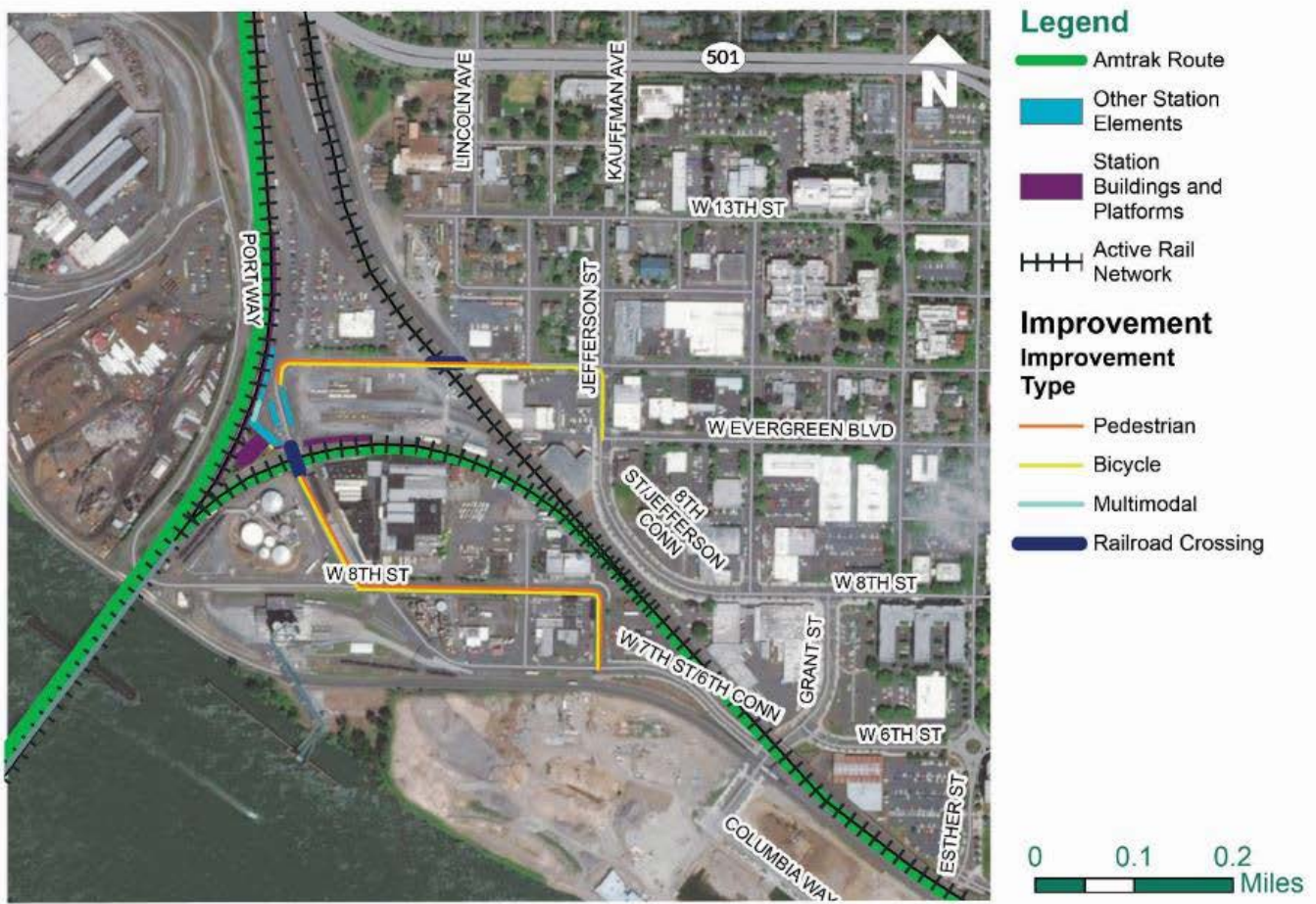
The station achieved a high sub-score in one category: zero-car households (an indicator of demand for transit). The analysis also highlights access issues surrounding the Vancouver station that include: a high number of at-grade railroad crossings, low availability of connecting sidewalks and bicycle routes, and a non-existent drop-off/pick-up area for customers. Photos 1, 2, and 5 highlight these issues.

Table 1. Connectivity Evaluation:		Vancouver, WA			
Categories & Measures	Measures	Maximum Points	Maximum Score	Points	Score
LAND USE	2	6	2	4	1.3
Station Location Context & Attractors		3		1	
Zero Car Household		3		3	
MOBILITY	3	9	3	3	1.0
Transit Service		3		0	
Private Transportation Connection Options		3		1	
Human Services Transportation		3		2	
CONNECTED TRANSPORTATION NETWORK	5	15	5	5	1.7
At-Grade Railroad Crossings		3		1	
Sidewalks		3		1	
Bicycle Facilities		3		1	
Drop-off/Pick-up Areas		3		0	
Wayfinding		3		2	
Station Connectivity-Total	10	30	10	12	4.0

Candidate improvements

Based on the results of the connectivity analysis and field visits, Figure 4 and Table 2 identify candidate pedestrian, bicycle, multimodal and railroad crossing improvements that can be expected to enhance connectivity to the Vancouver Amtrak station and promote increased safety for all travel modes. These candidate improvements, including potential project examples and/or locations, were identified based on the systemwide candidate improvement types, analysis of existing connectivity gaps, and site visits. These representative examples may include facilities owned by the State, Amtrak, railroads or local agencies. WSDOT will further evaluate the viability of the opportunities identified here to improve state facilities for better access to Amtrak Cascades stations. Amtrak, railroads and local agencies can consider implementing improvements to their facilities and operations, similar to these representative examples, as they develop their capital improvement and service plans.

Figure-4: Candidate Improvements



Vancouver Station Candidate Improvements

Table 2. Opportunities to Enhance Connectivity at Vancouver, WA Station

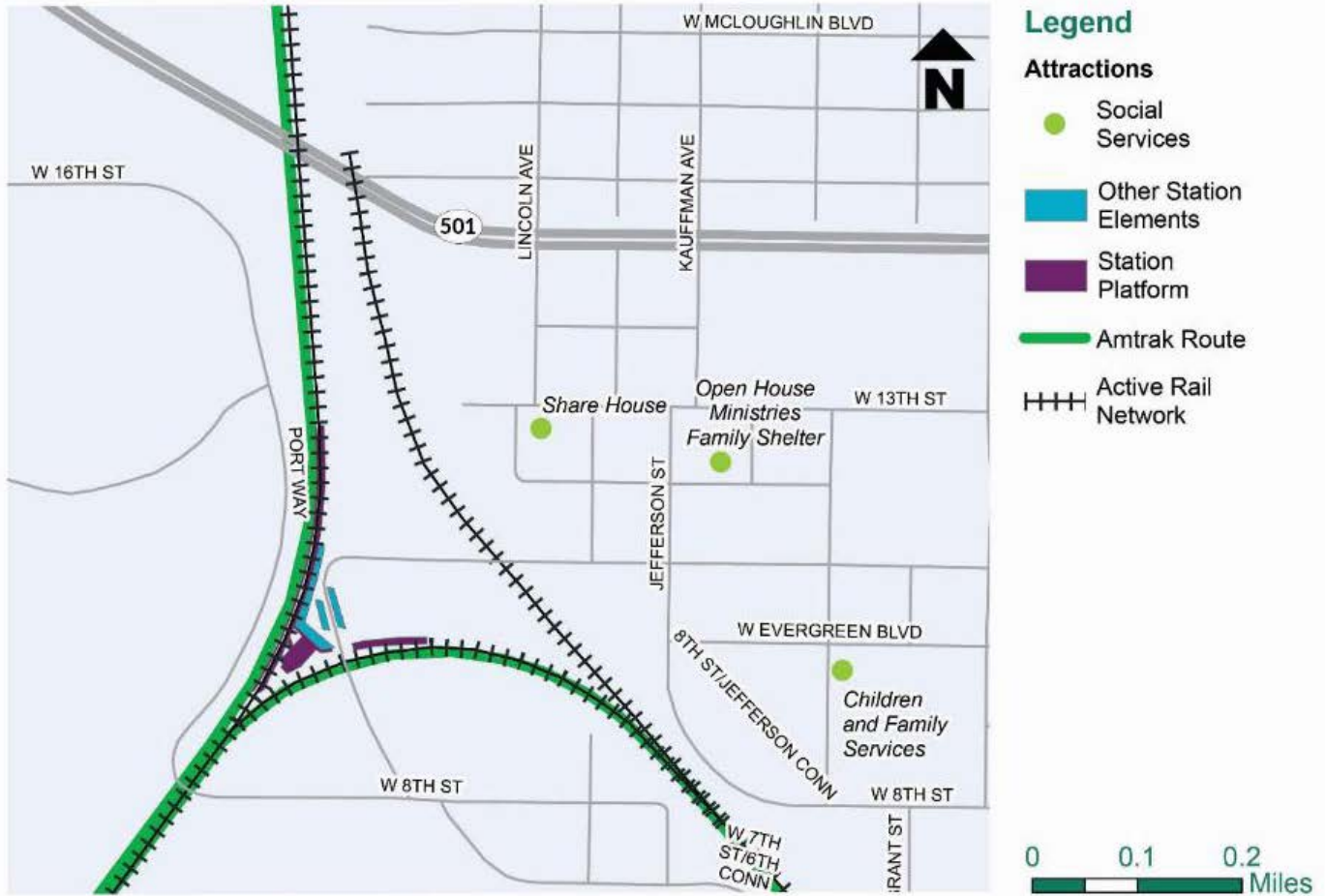
Type	Gaps	Candidate Improvement*	Potential Project Examples/Locations*
Bicycle	Station bicycle parking	Bicycle facility improvements within 1/2-mile radius of station	Install bike racks at station
Bicycle	Bicycle lanes	Bicycle facility improvements within 1/2-mile radius of station	Add a bicycle lane to connect to existing bicycle lane on Jefferson at Evergreen
Multimodal	Designated drop-off/pick-up area	Signing, striping, and additional designated drop-off/pick-up area for accessible/disabled transportation, either on-site or on-street at station areas	Repurpose existing parking spaces for curbside drop-off/pick-up
Multimodal	Wayfinding signs	Install additional wayfinding signs in station area	Locations to be determined
Pedestrian	Complete sidewalks (curb, gutter, ramps)	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	11th Street
Pedestrian and Bicycle	Pedestrian and bike connections to Waterfront Redevelopment area	Pedestrian and bike improvements on station to waterfront routes	Hill Street and 8th Street to Jefferson Street
Railroad Crossing	Consistent signing, striping, crossing gates, and crossing surface.	Railroad crossing improvements	11th Street and Hill Street
Transit	Direct local transit service connections.	Additional transit service to station area	New or modified transit routes

*WSDOT will work with stakeholders to improve access and connectivity to Amtrak Cascades stations. Local jurisdictions, transit agencies, Amtrak and railroads could consider addressing these opportunities when implementing their capital improvement and service development plans; some of the opportunities identified may also be addressed in these existing plans.

Connectivity analysis – supporting information

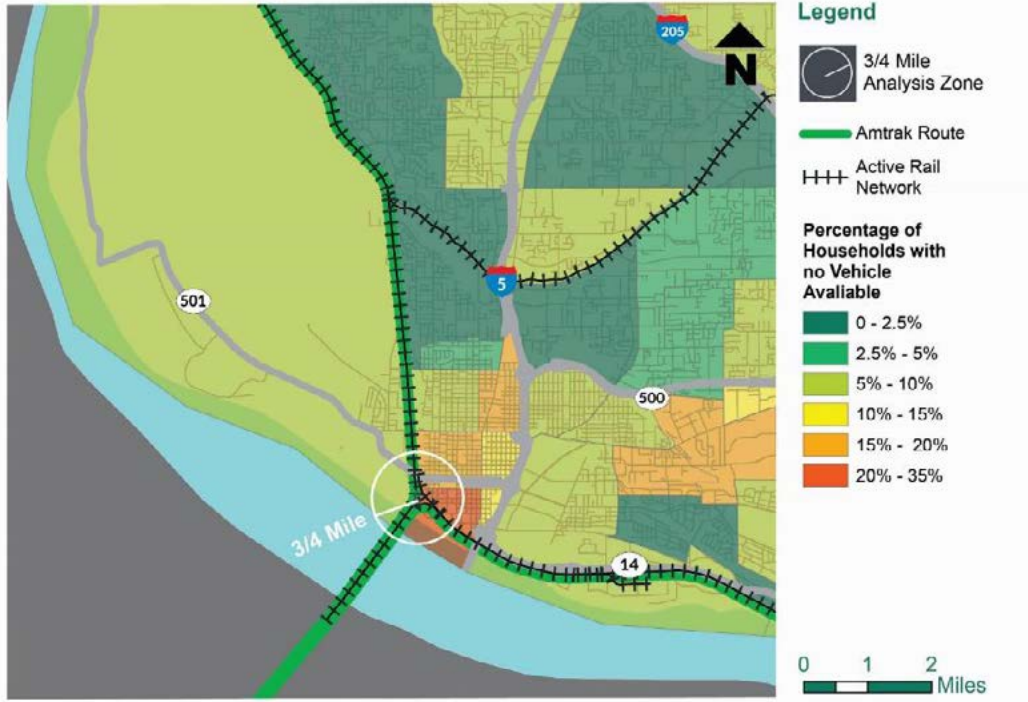
The summary results and connectivity score for the Vancouver station are supported by geospatial representations of four measured criteria (attractors, zero car households, sidewalks, and bicycle facilities) presented in the figures below and in Table C-1. Multimodal Connectivity Analysis: Observed Data & Assignment of Points.

Figure-5: Station Context-Attractors



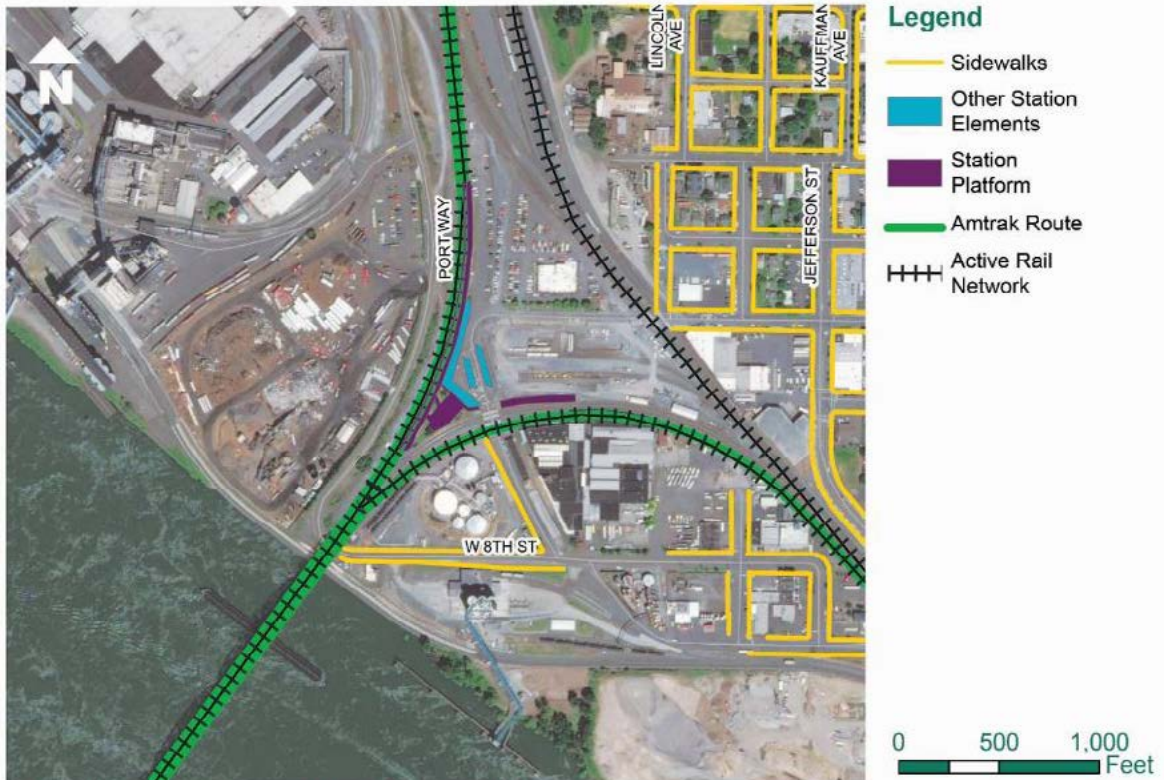
Vancouver Station Area Attractions

Figure-6: Zero-Car Households



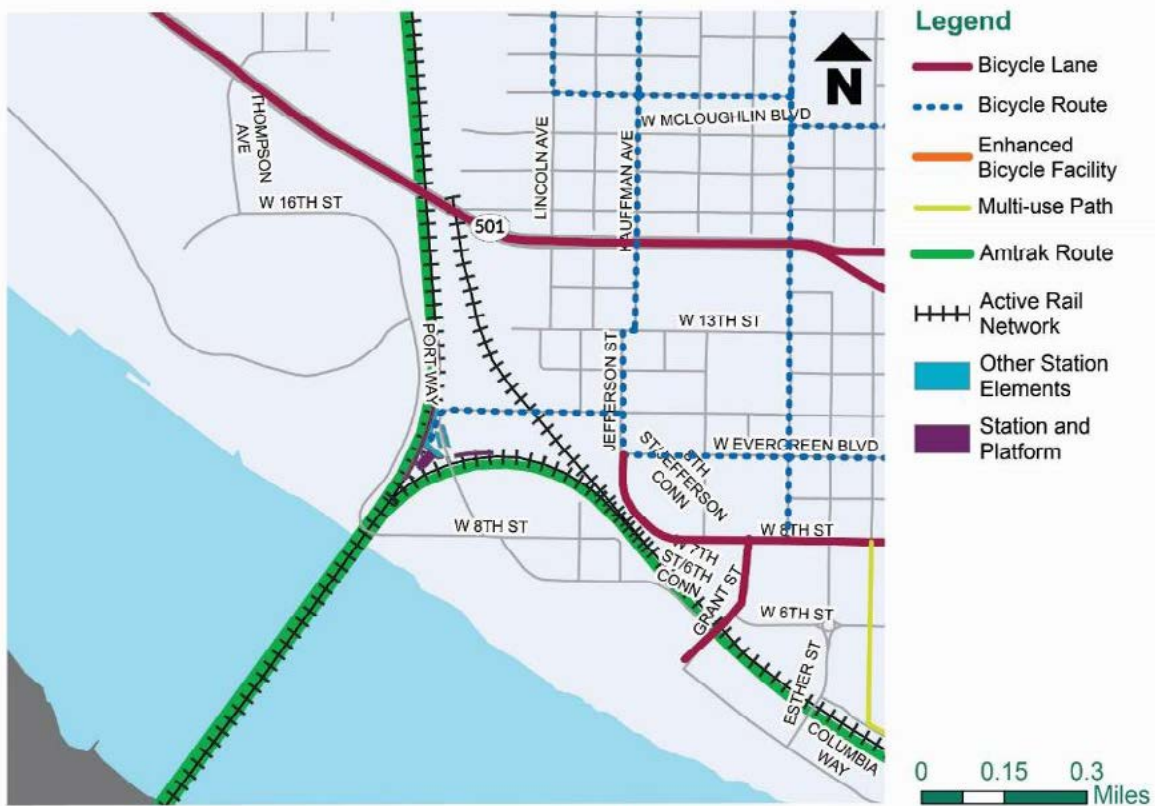
Vancouver Station Vehicle Availability by Household

Figure-7: Sidewalks



Vancouver Station Sidewalks

Figure-8: Bicycle Facilities



Vancouver Station Bicycle Facilities

Supporting information - photo documentation

Site visits were conducted in Vancouver, WA on October 10, 2018 to inventory assets at the station and assess multimodal connections.



Corner of Hill and 8th Street. Sidewalk in poor condition with no connectivity.



11th Street from station. No sidewalks, but wayfinding signs have been installed.



Amtrak Empire Builder Platform



Interior of Amtrak Station



Railroad Crossing of Hill Street



Railroad Crossing of 11th Street

Kelso, WA

Kelso Multimodal
 Transportation Center
 501 South First Avenue
 Kelso, WA 98626

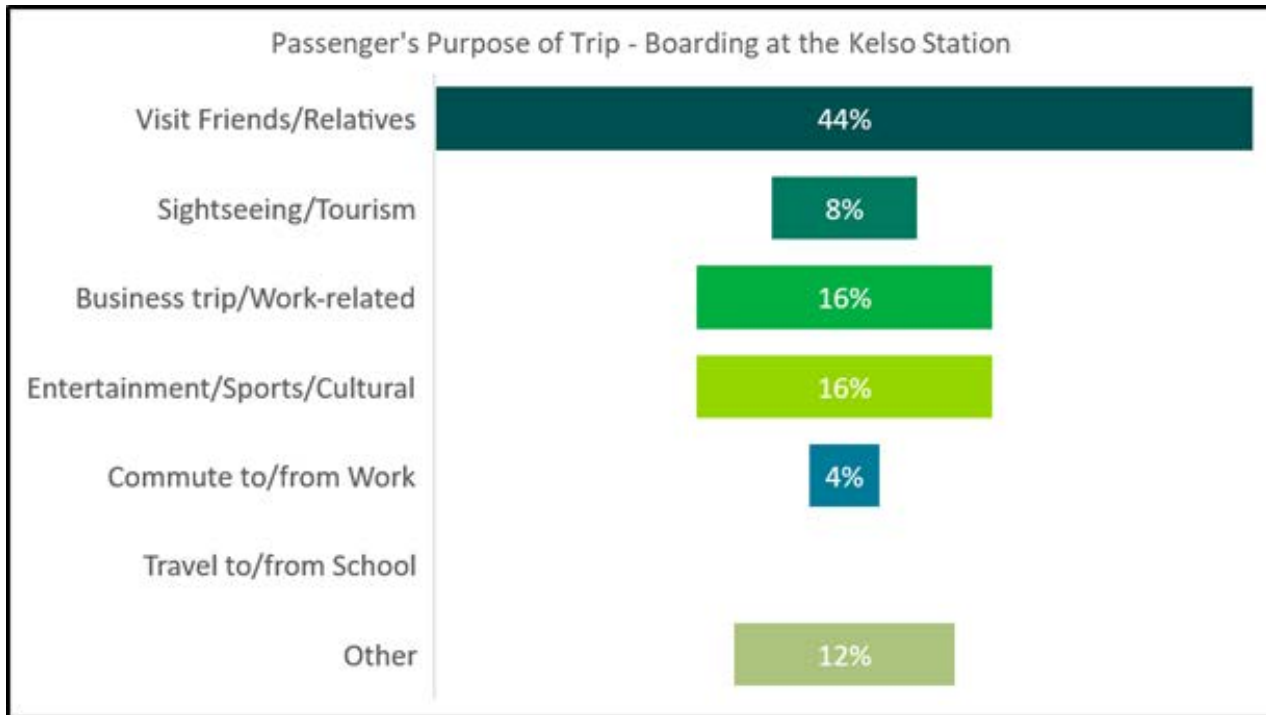


Station overview

The Kelso Multimodal Station connects directly to the downtown/main street area of Kelso, Washington. The City of Kelso is the owner and operator of the station, which is used to support the local bus system and offers public meeting facilities. The station is also known for its volunteers that provide customer service at the station.

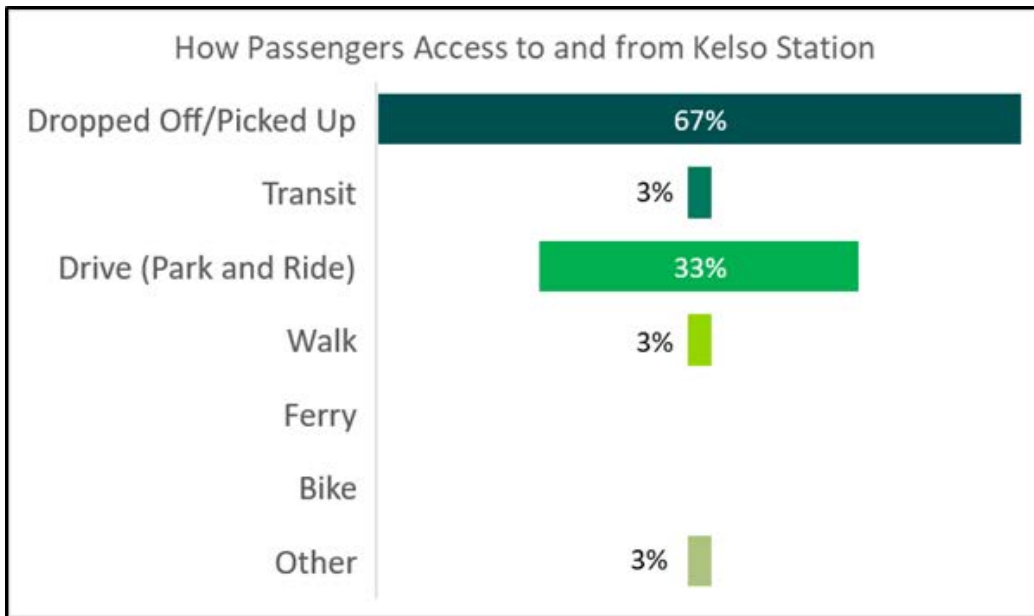
The station served approximately 26,000 passengers in 2017. Trip purpose and mode of access data gathered from a 2018 on-board passenger survey is summarized in Figures 1 and 2. (The on-board survey reached over 1,000 Amtrak Cascades passengers, producing statistically significant results for the corridor. However, at the station level, results may not be statistically significant, particularly at stations with lower ridership.)

Figure-1: Survey Results-Mode of Access



Note: Survey respondents had the option of selecting more than one response.

Figure-2: Survey Results-Mode of Access



Note: Survey respondents had the option of selecting more than one response.

Parking, and drop-off/pick-up

A surface parking lot at the station provides 10 parking spaces, including dedicated accessible parking spaces. Additionally, yellow curb markings in front of the station extend approximately 200 feet and can be used for drop-off/pick-up by taxi, transportation network companies, or human services transportation providers. However, there is no signage that indicates this use of the designated curb space.

Walk and transit access

From a pedestrian standpoint, the Kelso Station is very accessible. The two-main entry/exit points of the station connect to 1st Avenue and Ash Street. At this connection point, the City has improved the intersection with colored pavers and ADA compliant ramps. The street parallel to the station, Pacific Avenue, has marked crosswalks at every block that are supported by sidewalks. Additionally, pedestrian lighting is integrated into the station, on 1st Avenue, Ash Street, and Pacific Avenue.

The wayfinding signs are oriented to people driving cars, with icons and arrows that indicate where to turn for the Amtrak station. No wayfinding signs for people at the station were observed.

Access to local/regional bus service is integrated into the station. There are bus stops outside of the station connected by sidewalks.

Bicycle access

The Cowlitz River Trail, a shared use path that is separated from the train tracks by a fence, is the only bicycle facility providing a connection to the station. Access to this trail is not immediately adjacent to the station, and no wayfinding signs are posted. While there are no other existing bicycle facilities, the Cowlitz-Wahkiakum Council of Governments Bicycle and Pedestrian Assessment report indicates that there are many proposed bike improvements in Kelso connected to the Amtrak station area.

Connectivity analysis

As shown in Table 1, analysis of land use, mobility and transportation measures for the Kelso station yielded a connectivity score of 6.3, of a possible 10 points, indicating significant gaps in the existing connectivity of the station.

The station achieved high sub-scores in three categories: station location context, zero car households, and the connecting sidewalks. The analysis also highlights deficiencies of the Kelso Multimodal Station that include: low availability of bicycle routes and facilities, unclear areas for drop-off/pick-up, a low number of attractors, and low-quality wayfinding signs and information.

Table 1. Connectivity Evaluation Workbook:		Kelso/Longview			
Categories & Measures	Measures	Maximum Points	Maximum Score	Points	Score
LAND USE	2	6	2	6	2.0
Station Location Context & Attractors		3		3	
Zero Car Household		3		3	
MOBILITY	3	9	3	4	1.3
Transit Service		3		1	
Private Transportation Connection Options		3		1	
Human Services Transportation		3		2	
CONNECTED TRANSPORTATION NETWORK	5	15	5	9	3.0
At-Grade Railroad Crossings		3		3	
Sidewalks		3		3	
Bicycle Facilities		3		1	
Drop-off/Pick-up Areas		3		1	
Wayfinding		3		1	
Station Connectivity-Total	10	30	10	19	6.3

Candidate improvements

Based on the results of the connectivity analysis and the field visits, Figure 3 and Table 2 identify candidate pedestrian, bicycle, multimodal and railroad crossing improvements that can be expected to enhance connectivity to the Kelso Amtrak station and promote increased safety for all travel modes. These candidate improvements, including potential project examples and/or locations, were identified based on the systemwide candidate improvement types, analysis of existing connectivity gaps, and site visits. These representative examples may include facilities owned by the State, Amtrak, railroads or local agencies. WSDOT will further evaluate the viability of the opportunities identified here to improve state facilities for better access to Amtrak Cascades stations. Amtrak, railroads and local agencies can consider implementing improvements to their facilities and operations, similar to these representative examples, as they develop their capital improvement and service plans.

Figure-3: Candidate Improvements



Kelso-Longview Station Candidate Improvements

Table 2. Opportunities to Enhance Connectivity at Kelso/Longview

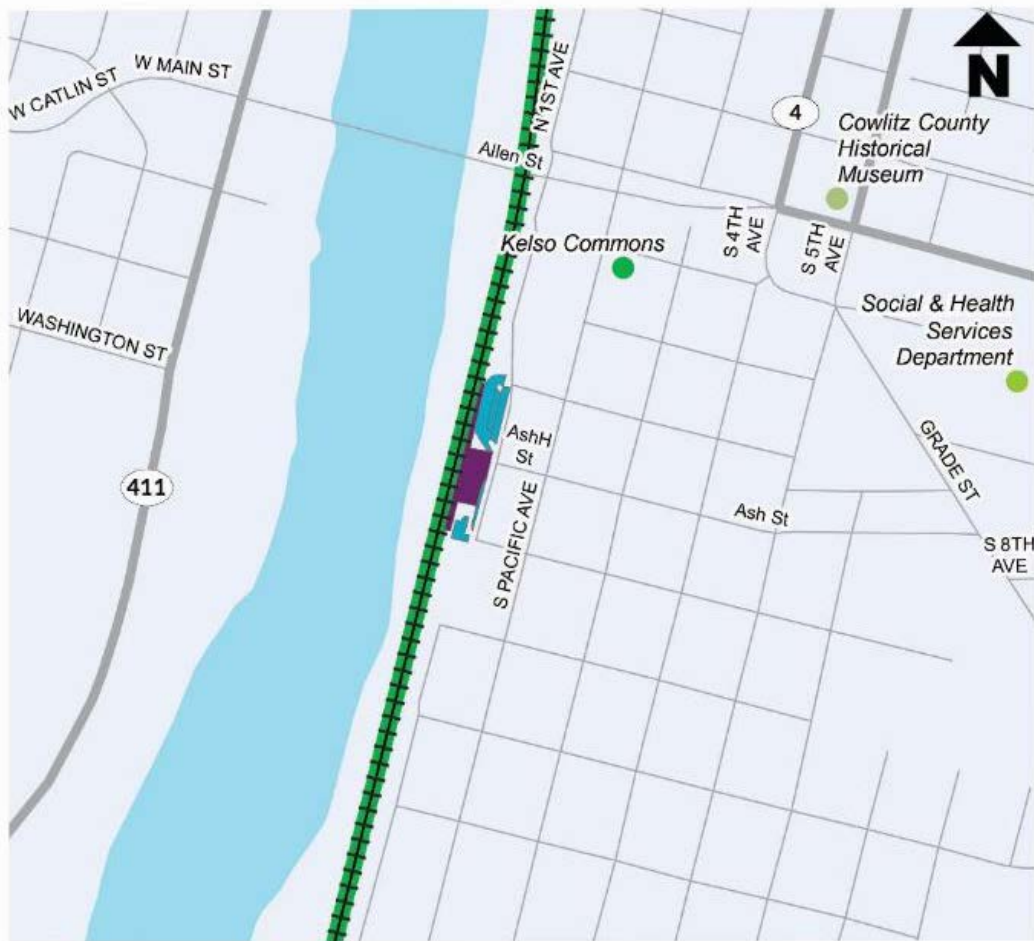
Type	Gaps	Candidate Improvement*	Potential Project Examples/ Locations*
Bicycle	Station area access to the Cowlitz River Trail	Bicycle facility improvements within 1/2-mile radius of station	Improve access to Cowlitz River Trail
Multimodal	Designated drop-off/ pick-up area	Signing, striping, and additional designated drop-off/pick-up area for accessible/disabled transportation, either on-site or on-street at station areas	Front of station
Multimodal	Wayfinding signs	Install additional wayfinding signs in station area	Locations to be determined

*WSDOT will work with stakeholders to improve access and connectivity to Amtrak Cascades stations. Local jurisdictions, transit agencies, Amtrak and railroads could consider addressing these opportunities when implementing their capital improvement and service development plans; some of the opportunities identified may also be addressed in these existing plans.

Supporting information - connectivity analysis

The summary results and connectivity score for the Kelso station are supported by geospatial representations of four measured criteria (attractors, zero car households, sidewalks, and bicycle facilities) presented in the figures below and in Table C-1. Multimodal Connectivity Analysis: Observed Data & Assignment of Points.

Figure-4: Station Context: Attractors



Legend

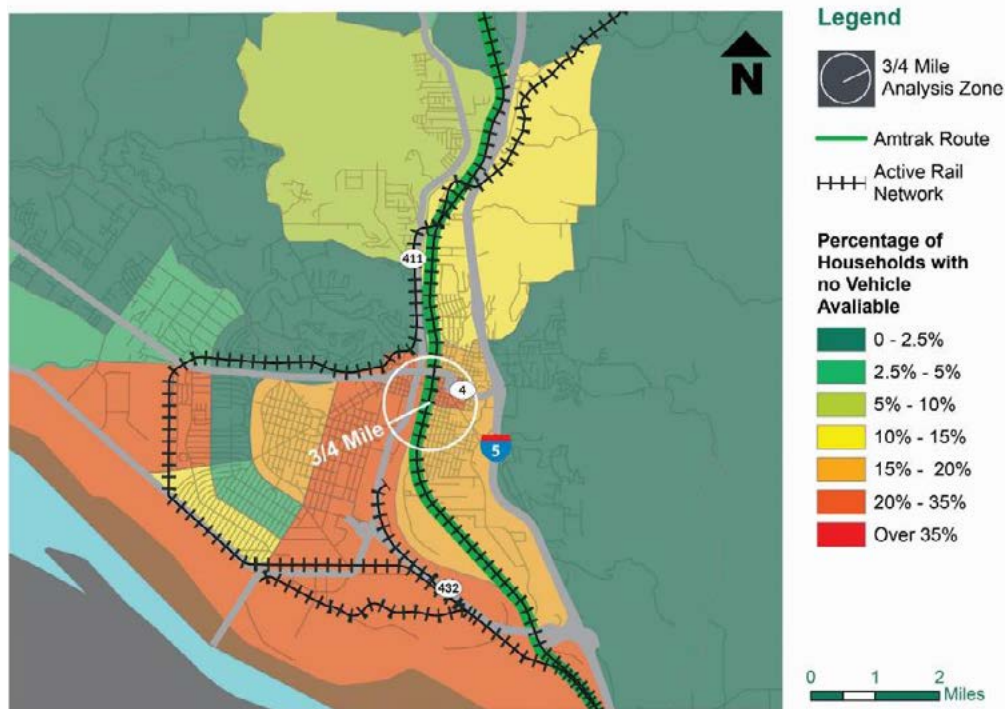
Attractions

- Museum
- Park
- Social Services
- Other Station Elements
- Station Buildings and Platforms
- Amtrak Route
- Active Rail Network



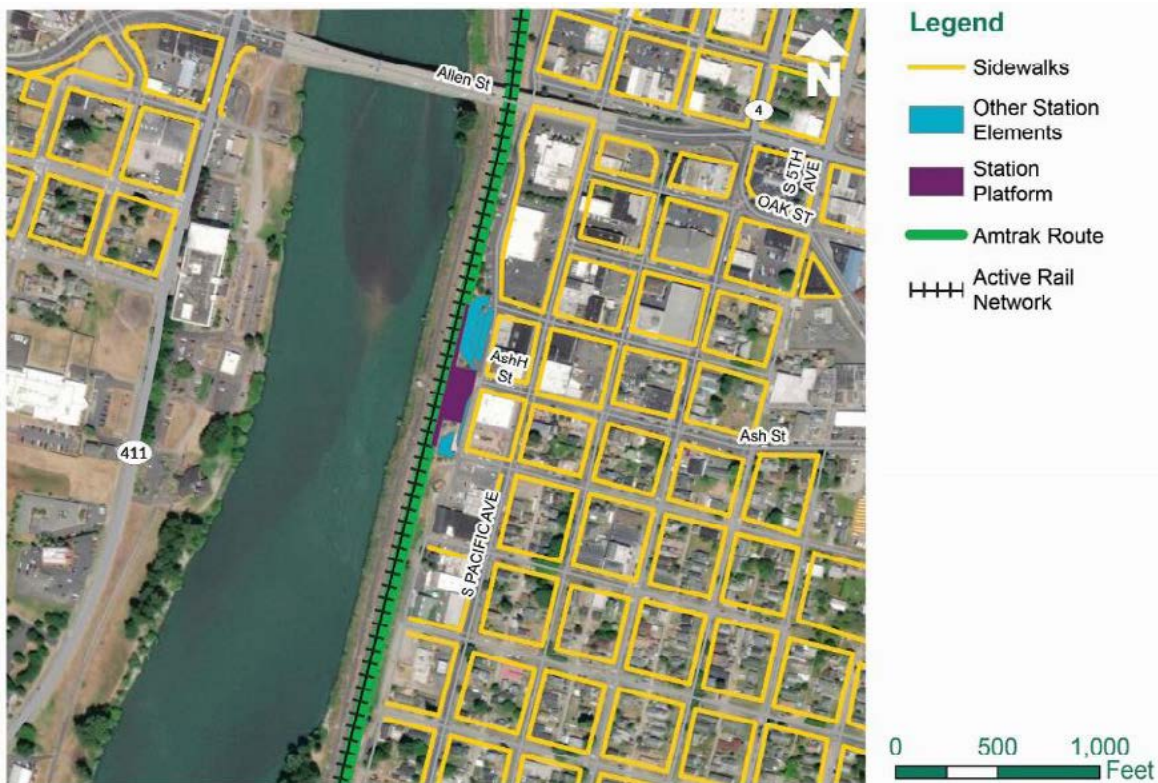
Kelso-Longview Station Area Attractions

Figure-5: Zero-Car Households



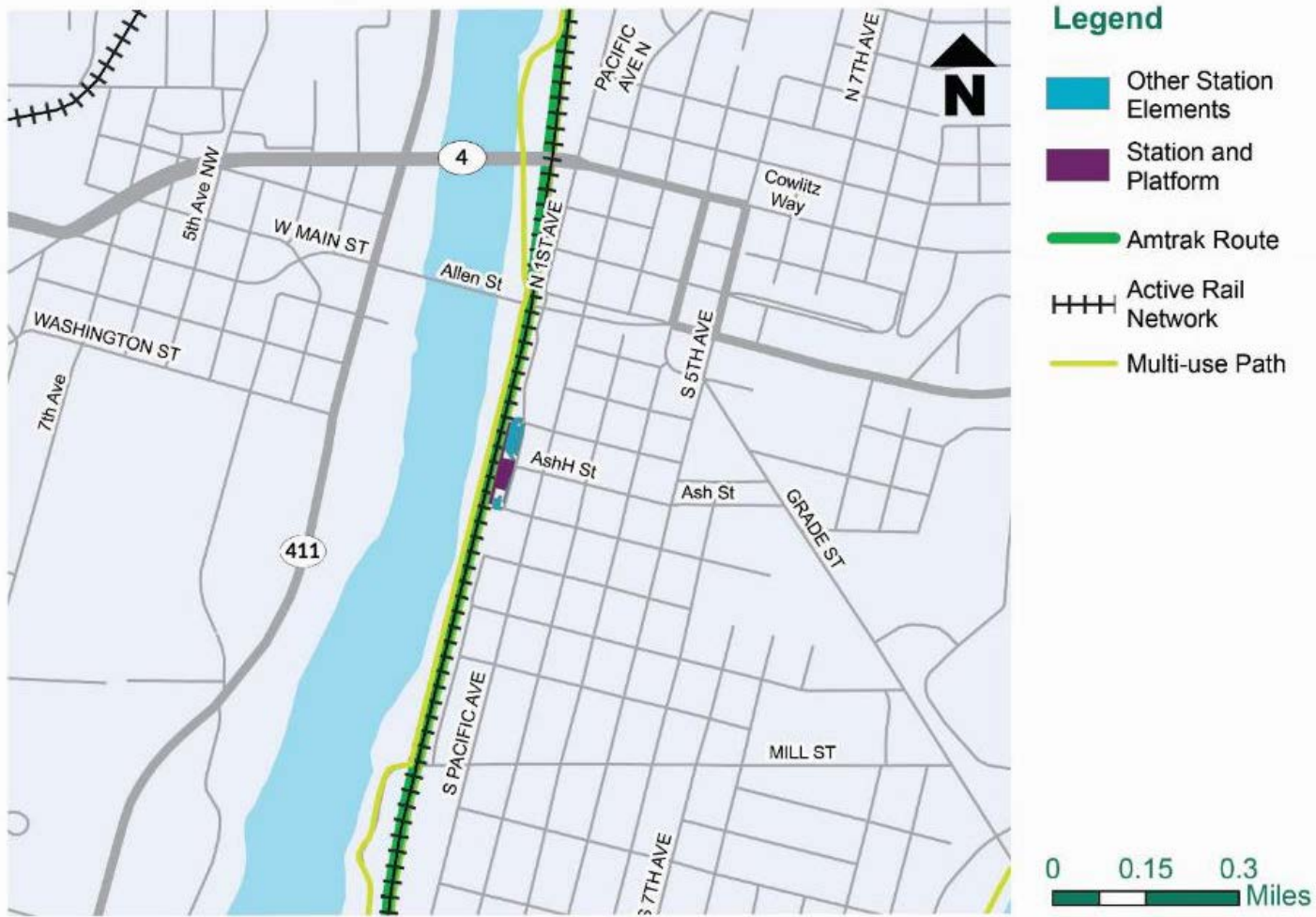
Kelso Station Vehicle Availability by Household

Figure-6: Sidewalks



Kelso Station Sidewalks

Figure-7: Bicycle Facilities



Kelso Station Bicycle Facilities

Supporting information - photo documentation

Site visits were conducted in Kelso on July 25, 2018 and October 10, 2018 to inventory assets at the station and assess multimodal connections.



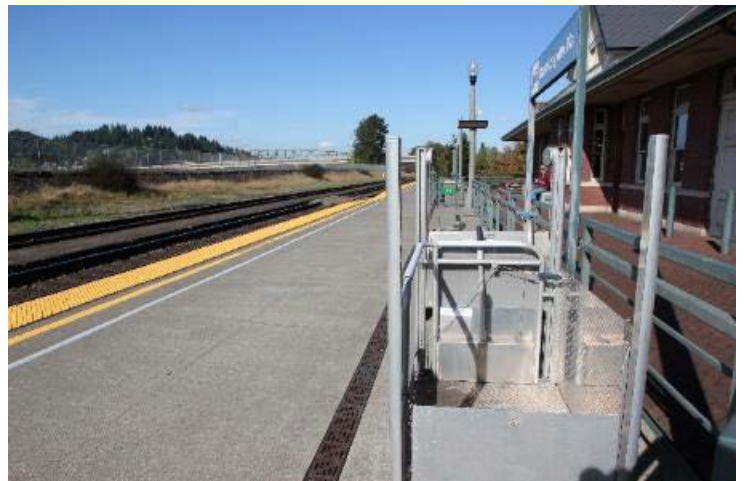
Kelso Station information board.



Pedestrian crosswalks and sidewalks.



Local bus stop adjacent to the Station.



Kelso platform, railroad tracks.



Kelso Station transit parking signage.

Centralia, WA

Centralia Station
 210 Railroad Ave
 Centralia, WA 98531

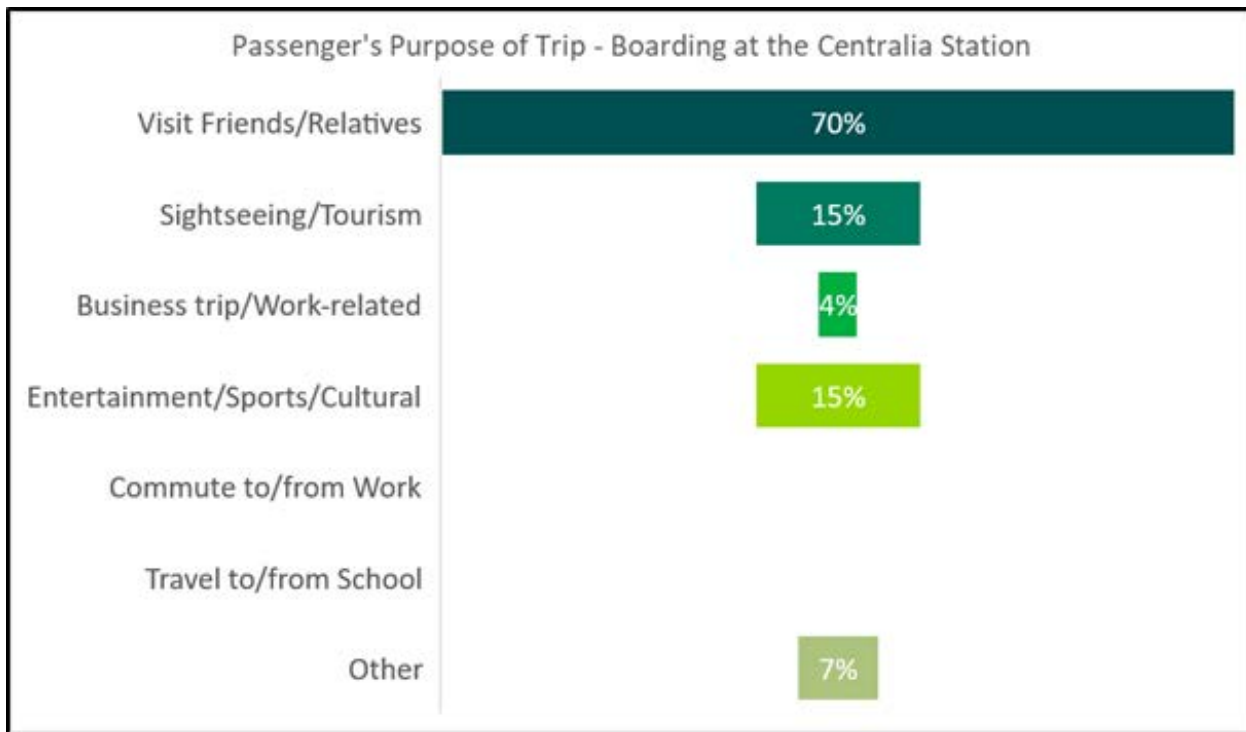


Station Overview

The Centralia Station serves both Amtrak trains and local bus service and is owned by the City of Centralia. This station is also used for special/community events. The station connects directly to downtown Centralia, Washington which has numerous antique shops, eateries, and commercial businesses.

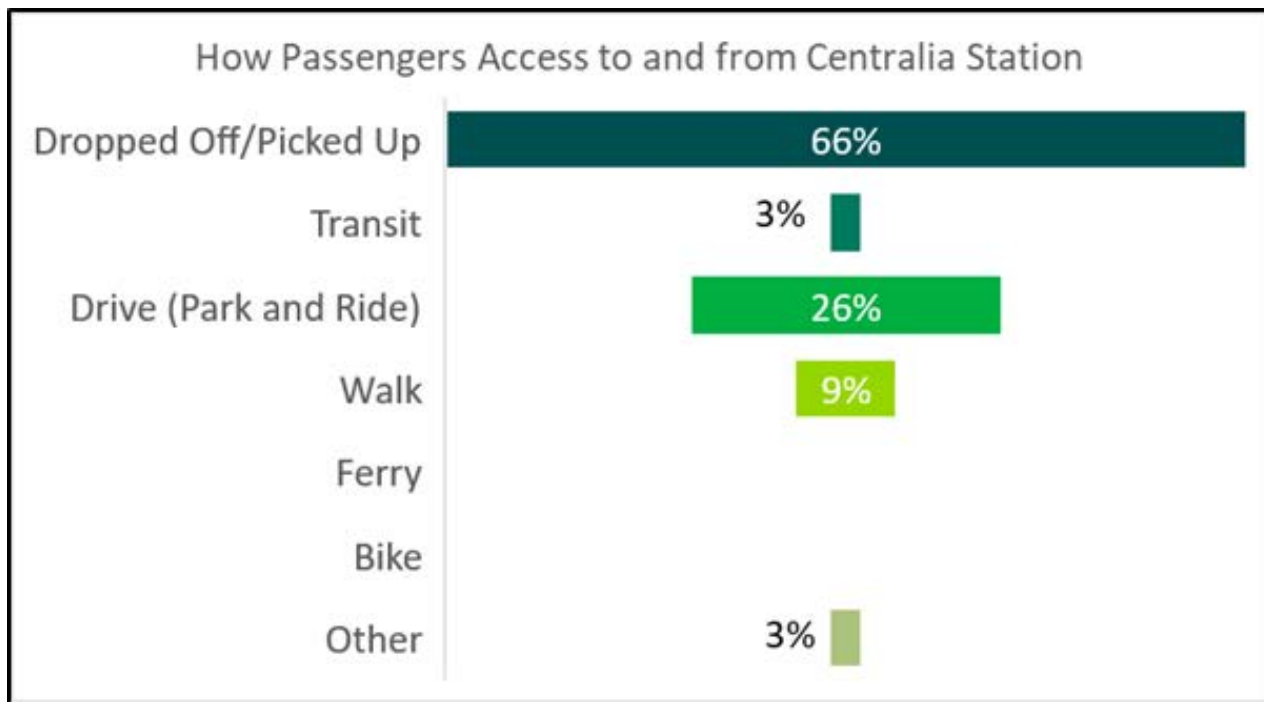
The station served approximately 22,000 passengers in 2017. Trip purpose and mode of access data gathered from a 2018 on-board passenger survey is summarized in Figures 1 and 2. (The on-board survey reached over 1,000 Amtrak Cascades passengers, producing statistically significant results for the corridor. However, at the station level, results may not be statistically significant, particularly at stations with lower ridership.)

Figure-1: Survey Results-Trip Purpose



Note: Survey respondents had the option of selecting more than one response.

Figure-2: Survey Results-Mode of Access



Note: Survey respondents had the option of selecting more than one response.

Parking, and drop-off/pick-up

Twenty-five parking spaces, including dedicated accessible parking spaces, are provided in surface parking lots at the station. A curb designation extends for about 375 feet in front of the station; this area is used for drop-off/pick-up (use for taxi, transportation network companies, or human services transportation), and bus services. There is signage that indicates that it is for a bus stop/parking, but the signage does not designate it as a drop-off/pick-up zone.

Walk and transit access

From a pedestrian standpoint, the Centralia Station is very accessible, as it connects to the downtown area, with more restricted access connecting to the east side of the station to the residential area. The station faces the back end of the commercial/downtown area on Railroad Avenue, which acts like an alley for the far side of the street. There are sidewalks on one side of this street, the side that is closest to the station. The west side of the street is mainly used for parking, utilities, and trash pick-up/commercial delivery. Pine Street and Magnolia Street directly connect to downtown and have sidewalks and lighting; these streets do not cross the tracks to the east of Centralia Station. Maple Street and Main Street frame the station on the north and south sides of the station parking lots and connect to a residential area on the east side of the railroad tracks. Maple Street does not have sidewalks, nor marked pedestrian crosswalks over the railroad tracks. Main Street does have sidewalks and marked at-grade pedestrian crosswalks over the railroad tracks.

The wayfinding signs are oriented to people driving cars, with icons and arrows that indicate where to turn for the Amtrak station. Even though the station profile indicated that there are wayfinding signs at the station for users, none were observed. Access to local/regional bus service is integrated into the station. There is a signed area for buses.

Bicycle access

People using bicycles to access the Centralia station have limited options. Although the Cowlitz-Wahkiakum Council of Governments Bicycle and Pedestrian Assessment Report indicates there are existing 'Active Transportation Facilities,' this report does not distinguish between sidewalks and bicycle facilities. The results of a site visit indicated there are no connecting bicycle facilities. Bicycle parking racks are provided at the station.

Connectivity analysis

As shown in Table 1, analysis of land use, mobility and transportation network measures for Centralia Station yielded a connectivity score of 6.0, of a possible 10 points, indicating significant gaps in the existing connectivity of the station.

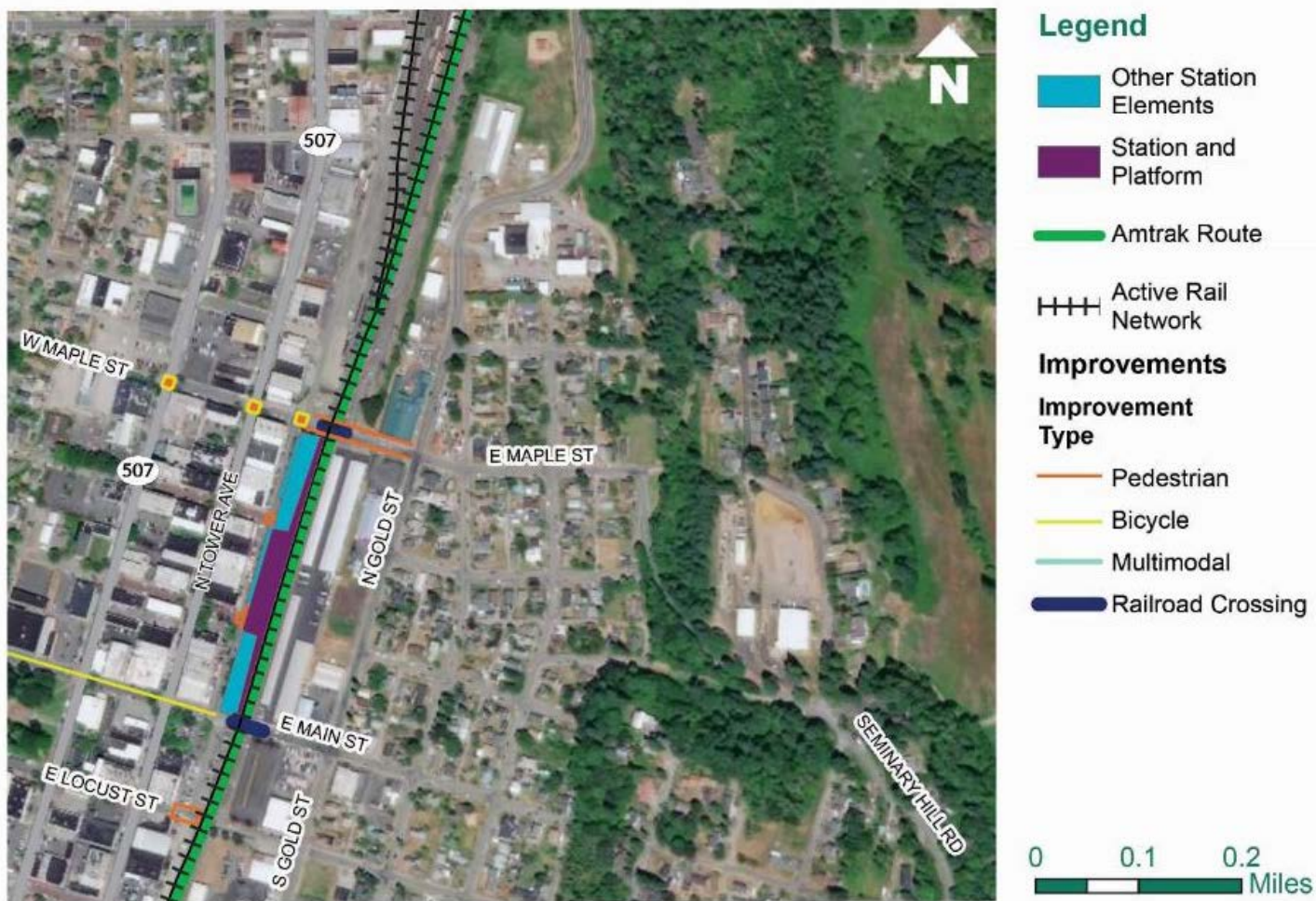
The station achieved higher sub-scores in the three categories: the context of station location, the connection to the regional human services transportation plan, and connected sidewalks. The analysis also highlights deficiencies surrounding the Centralia station that include: a high number of at grade railroad crossings, low availability of connecting bicycle routes and unclear drop-off/pick-up demarcation for customers.

Table 1. Connectivity Evaluation:		Centralia			
Categories & Measures	Measures	Maximum Points	Maximum Score	Points	Score
LAND USE	2	6	2	6	2.0
Station Location Context & Attractors		3		3	
Zero-Car Households		3		3	
MOBILITY	3	9	3	5	1.7
Transit Service		3		1	
Private Transportation Connection Options		3		1	
Human Services Transportation		3		3	
CONNECTED TRANSPORTATION NETWORK	5	15	5	6	2.0
At-Grade Railroad Crossings		3		0	
Sidewalks		3		3	
Bicycle Facilities		3		1	
Drop-off/Pick-up Areas		3		1	
Wayfinding		3		1	
Station Connectivity-Total	10	30	10	17	5.7

Candidate improvements

Based on the results of the connectivity analysis and the field visits, Figure 3 and Table 2 identify candidate pedestrian, bicycle, multimodal and railroad crossing improvements that can be expected to enhance connectivity to the Centralia Amtrak station and promote increased safety for all travel modes. These candidate improvements, including potential project examples and/or locations, were identified based on the systemwide candidate improvement types, analysis of existing connectivity gaps, and site visits. These representative examples may include facilities owned by the State, Amtrak, railroads or local agencies. WSDOT will further evaluate the viability of the opportunities identified here to improve state facilities for better access to Amtrak Cascades stations. Amtrak, railroads and local agencies can consider implementing improvements to their facilities and operations, similar to these representative examples, as they develop their capital improvement and service plans.

Figure-3: Candidate Improvements



Centralia Station Candidate Improvements

Table 2. Opportunities to Enhance Connectivity at Centralia Station

Type	Gaps	Candidate Improvement*	Potential Project Examples/ Locations*
Bicycle	Bicycle lanes	Bicycle facility improvements within 1/2-mile radius of station	Main Street-upgrade facility from bike route to bike lanes
Multimodal	Designated drop-off/ pick-up area	Signage, striping, and additional designated drop-off/pick-up area for accessible/disabled transportation, either on-site or on-street at station areas	Railroad Avenue (front of station) signage/striping improvements
Multimodal	Wayfinding signs	Install additional wayfinding signs in station area	Locations to be determined
Pedestrian	Complete sidewalks (curb, gutter, ramps)	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	Locust Street and Railroad Avenue
Pedestrian	Pedestrian Crossings	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	Maple Street, from railroad tracks to Pearl Street: pedestrian warning improvements (rapid flashing beacons, etc.)
Railroad Crossing	Consistent signing, striping, crossing gates, and crossing surface.	Railroad crossing improvements	Main Street, Maple Street
Transit	Direct local transit service connections.	Additional transit service to station area	New or modified transit routes

*WSDOT will work with stakeholders to improve access and connectivity to Amtrak Cascades stations. Local jurisdictions, transit agencies, Amtrak and railroads could consider addressing these opportunities when implementing their capital improvement and service development plans; some of the opportunities identified may also be addressed in these existing plans.

Supporting information - connectivity analysis

The summary results and connectivity score for the Centralia station are supported by geospatial representations of four measured criteria (attractors, zero car households, sidewalks, and bicycle facilities) presented in the figures below and in Table C-1. Multimodal Connectivity Analysis: Observed Data & Assignment of Points.

Figure-4: Station Context - Attractors

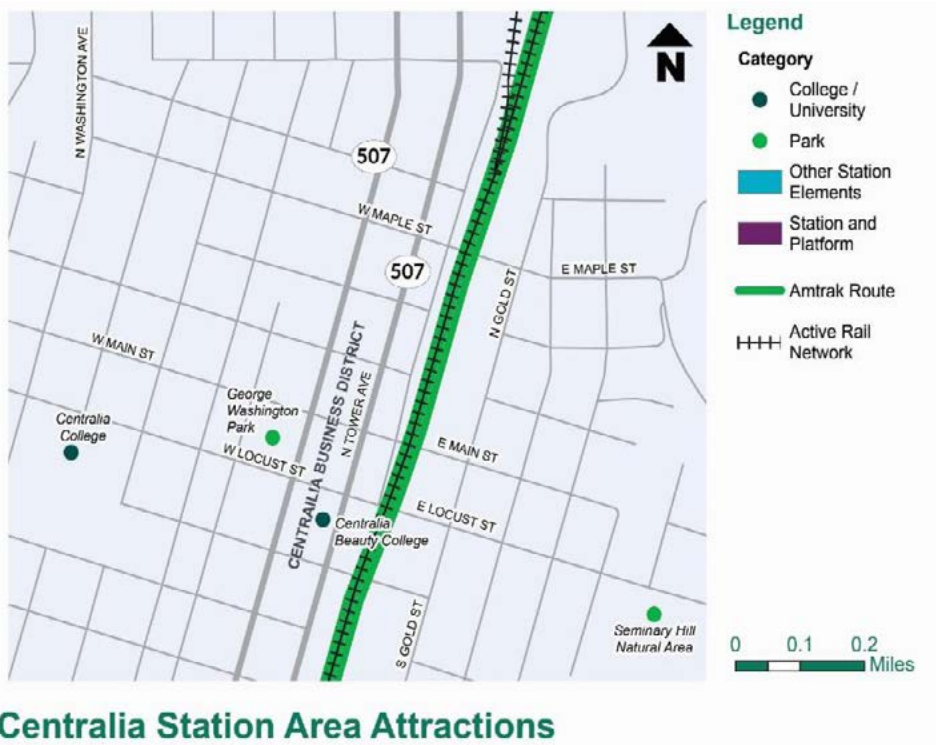


Figure-5: Zero-Car Households

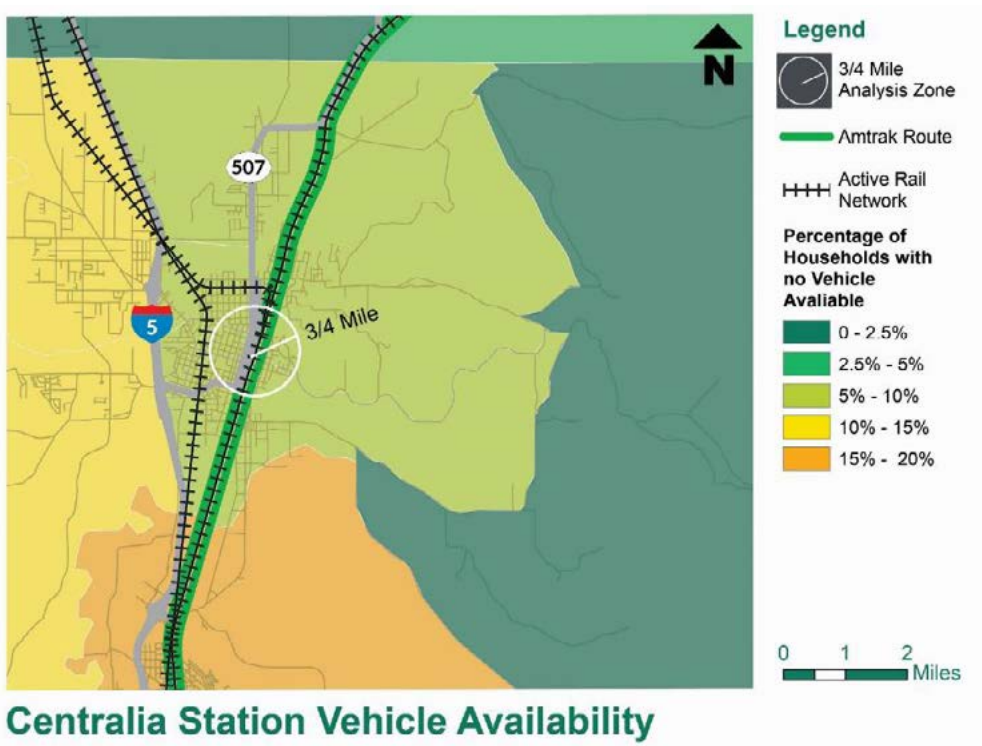
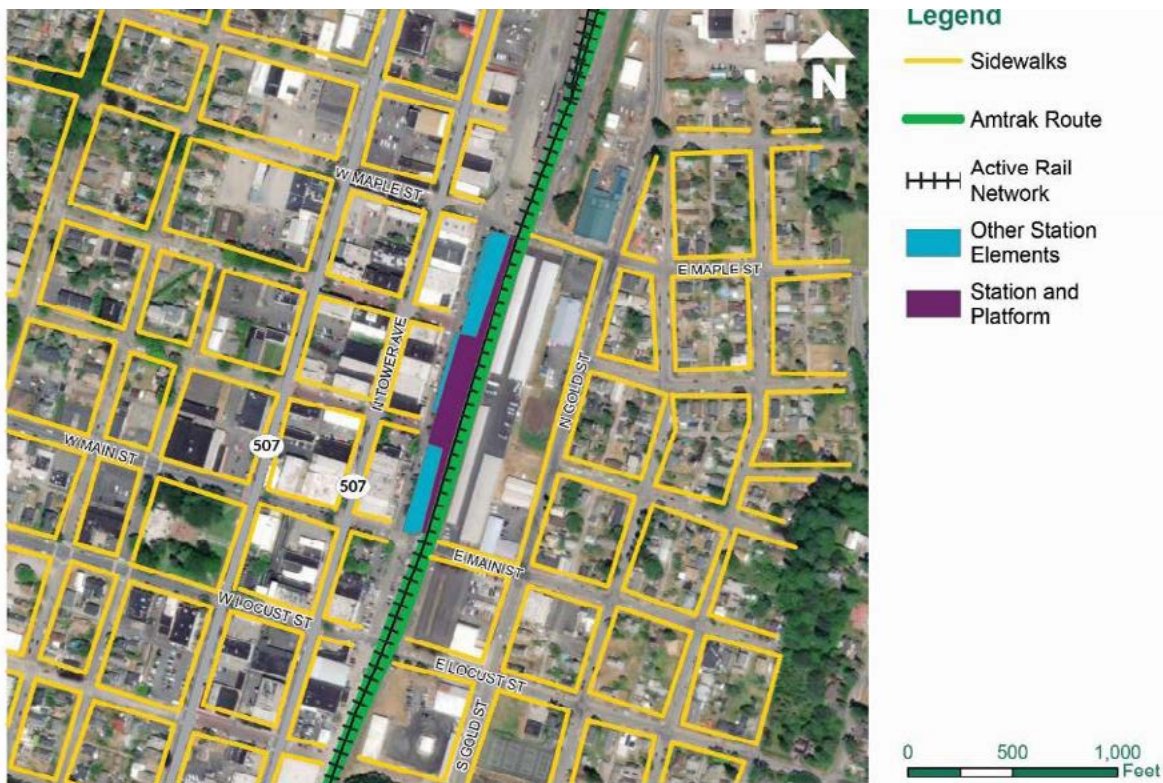


Figure-6: Sidewalks



Centralia Station Sidewalks

Figure-7: Bicycle Facilities



Centralia Station Bicycle Facilities

Supporting information - photo documentation

Site visits were conducted on October 10, 2018 to inventory assets at the station and assess multimodal connections.



Centralia Station frontage to Railroad Ave.



Centralia's wide sidewalks.



Amtrak Cascades train arriving at Centralia Station.



Interior of Amtrak Station



Striped pedestrian crosswalk.



Local bus stop with striped curb north of the station building on Railroad

Olympia - Lacey, WA

Centennial Station
 6600 Yelm Hwy SE
 Lacey, WA 98513

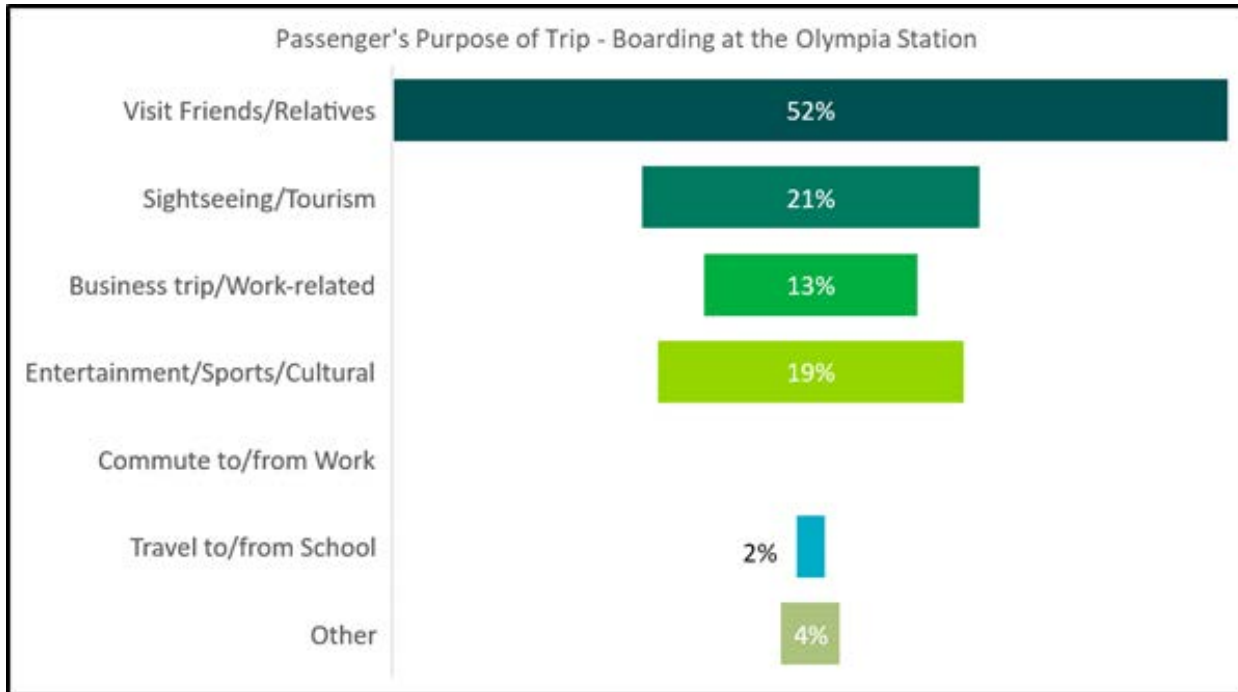


Station overview

Centennial Station, serving the Olympia, Washington area, is located outside the Lacey City limits in Thurston County, Washington. The station is owned by Intercity Transit and managed by a group of at least sixty volunteers that support the Amtrak Cascades and Coast Starlight customers. Unlike most Cascades stations in Washington, which are typically located near the center of urban areas or town centers, the station is located on the fringe between rural and developed land uses. Access to the station is from a two-lane highway with no dedicated bike or pedestrian features.

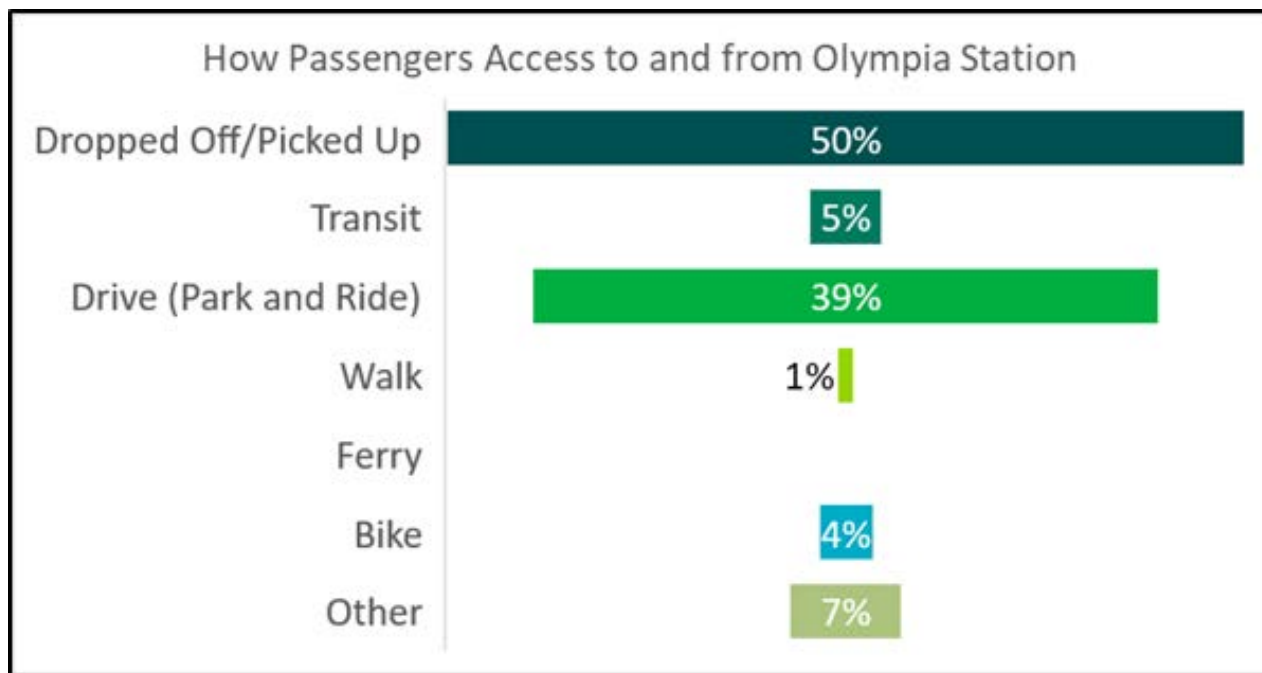
The station served approximately 52,000 passengers in 2017. Trip purpose and mode of access data gathered from a 2018 on-board passenger survey is summarized in Figures 1 and 2. (The on-board survey reached over 1,000 Amtrak Cascades passengers, producing statistically significant results. However, at the station level, results may not be statistically significant, particularly at stations with lower ridership.)

Figure-1: Survey Results-Trip Purpose



Note: Survey respondents had the option of selecting more than one response

Figure-2: Survey Results-Mode of Access



Note: Survey respondents had the option of selecting more than one response.

Parking and drop-off/pick-up

The station has 98 parking spaces, including dedicated accessible parking spaces, are provided in a surface parking lot. Additionally, yellow curb markings in front of the station delineate an area used for drop-off/pick-up by taxi, transportation network companies, human services transportation providers and transit (bus) service.

Walk and transit access

From a pedestrian standpoint, Centennial Station is not accessible. The station only offers a single roadway connection to Yelm Highway. Neither the access road nor Yelm Highway has sidewalks in the station area.

Wayfinding signs are oriented to people driving cars, with icons and arrows that indicate where to turn for the Amtrak station.

Connections to local and regional bus service are integrated into the station. There is a designated bus stop location with a bus shelter.

Bicycle access

People using bicycles to access the Olympia station have limited options. The Yelm Highway has no designated bicycle lane near the station but does have wide shoulders that allows access for bicyclists that are ‘fearless and confident’ riders. This shoulder becomes restricted on the roadway overpass of the railroad tracks. Bicycle racks have been provided adjacent to the Intercity Transit shelters at the station.

Connectivity analysis

As shown in Table 1, analysis of land use, mobility and transportation network measures for the station yielded a connectivity score of 4.7, of a possible 10 points, indicating significant gaps in the existing connectivity of the station.

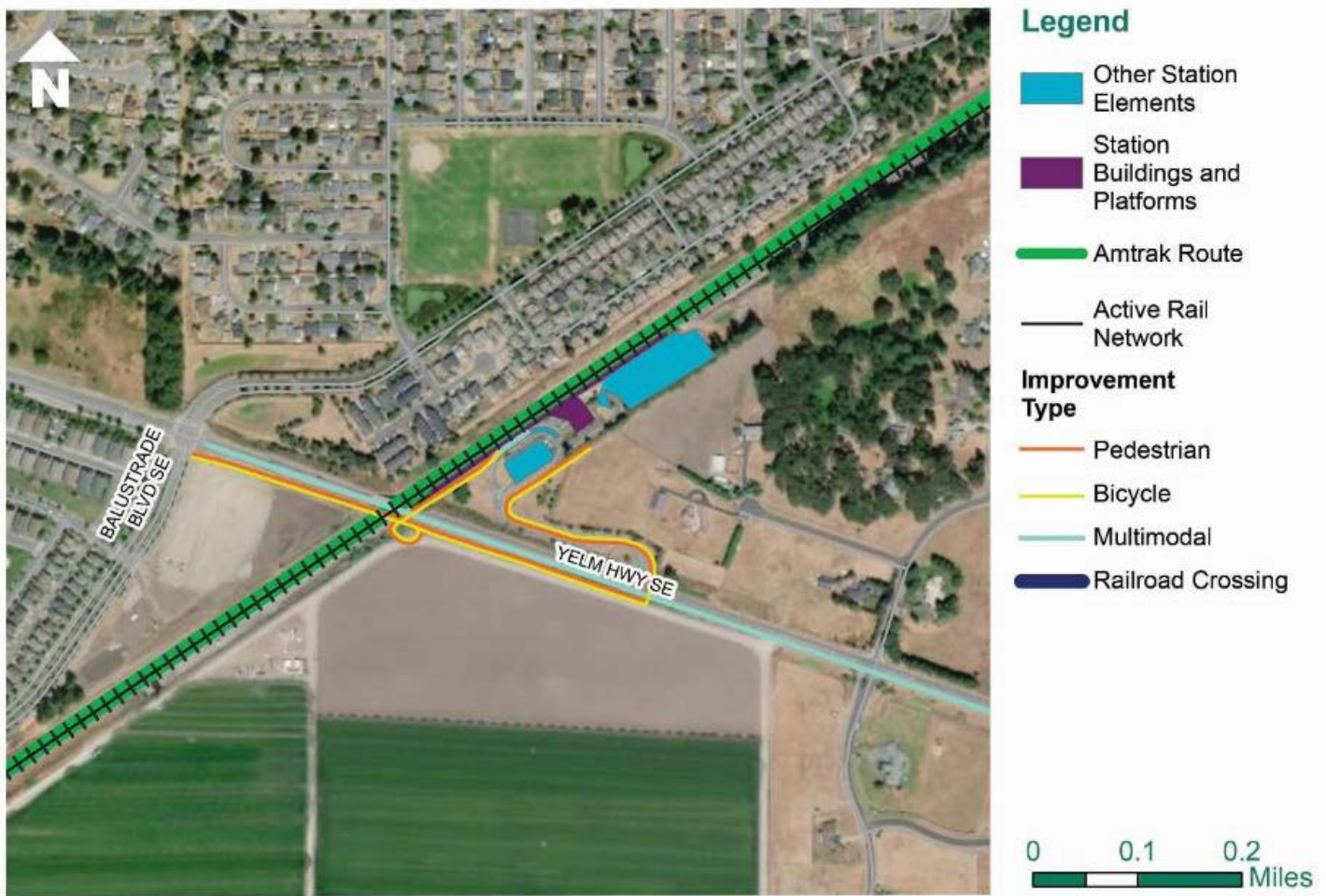
The station achieved a high sub-scores only for its human services transportation access and for the lack of at-grade railroad crossings. The analysis highlights deficiencies surrounding the Lacey-Olympia station that include: lack of supportive land uses; low availability of connecting sidewalks and bicycle routes; a lack of connecting transit routes; auto-oriented wayfinding signs, and an unclear drop-off/pick-up area for customers.

Table 1. Connectivity Evaluation:		Olympia Lacey			
Categories & Measures	Measures	Maximum Points	Maximum Score	Points	Score
LAND USE	2	6	2	2	0.7
Station Location Context & Attractors		3		1	
Zero-Car Households		3		1	
MOBILITY	3	9	3	5	1.7
Transit Service		3		1	
Private Transportation Connection Options		3		1	
Human Services Transportation		3		3	
CONNECTED TRANSPORTATION NETWORK	5	15	5	7	2.3
At-Grade Railroad Crossings		0		3	
Sidewalks		3		1	
Bicycle Facilities		3		1	
Drop-off/Pick-up Areas		3		1	
Wayfinding		3		1	
Station Connectivity-Total	10	30	10	14	4.7

Candidate improvements

Based on the results of the connectivity evaluation and the field visits, Figure 3 and Table 2 identify candidate pedestrian, bicycle, multimodal and railroad crossing improvements that can be expected to enhance connectivity to the Olympia Centennial Station and promote increased safety for all travel modes. These candidate improvements, including potential project examples and/or locations, were identified based on the system-wide candidate improvement types, analysis of existing connectivity gaps, and site visits. These representative examples may include facilities owned by the State, Amtrak, railroads or local agencies. WSDOT will further evaluate the viability of the opportunities identified here to improve state facilities for better access to Amtrak Cascades stations. Amtrak, railroads and local agencies can consider implementing improvements to their facilities and operations, similar to these representative examples, as they develop their capital improvement and service plans.

Figure-3: Candidate Improvements



Olympia-Lacey Station Candidate Improvements

Table 2. Opportunities to Enhance Connectivity at Olympia Lacey

Type	Gaps	Candidate Improvement*	Potential Project Examples/ Locations*
Bicycle & Pedestrian	Sidewalks, bicycle lanes, and direct multimodal connections from Yelm Highway to the Amtrak station.	Pedestrian and bicycle facility improvements within 1/2-mile radius of station	Yelm Highway & station driveway
Multimodal	Designated drop-off/pick-up area	Signage, striping, and additional designated drop-off/pick-up area for accessible/disabled transportation, either on-site or on-street at station areas	Front of station
Multimodal	Wayfinding signs	Install additional wayfinding signs in station area	Locations to be determined

*WSDOT will work with stakeholders to improve access and connectivity to Amtrak Cascades stations. Local jurisdictions, transit agencies, Amtrak and railroads could consider addressing these opportunities when implementing their capital improvement and service development plans; some of the opportunities identified may also be addressed in these existing plans.

Supporting information - connectivity analysis

The summary results and connectivity score for the Olympia- Lacey station are supported by geospatial representations of four measured criteria (attractors, zero car households, sidewalks, and bicycle facilities) presented in the figures below and in Table C-1. Multimodal Connectivity Analysis: Observed Data & Assignment of Points.

Figure-4: Station Context: Attractors



Figure-5: Zero-Car Households

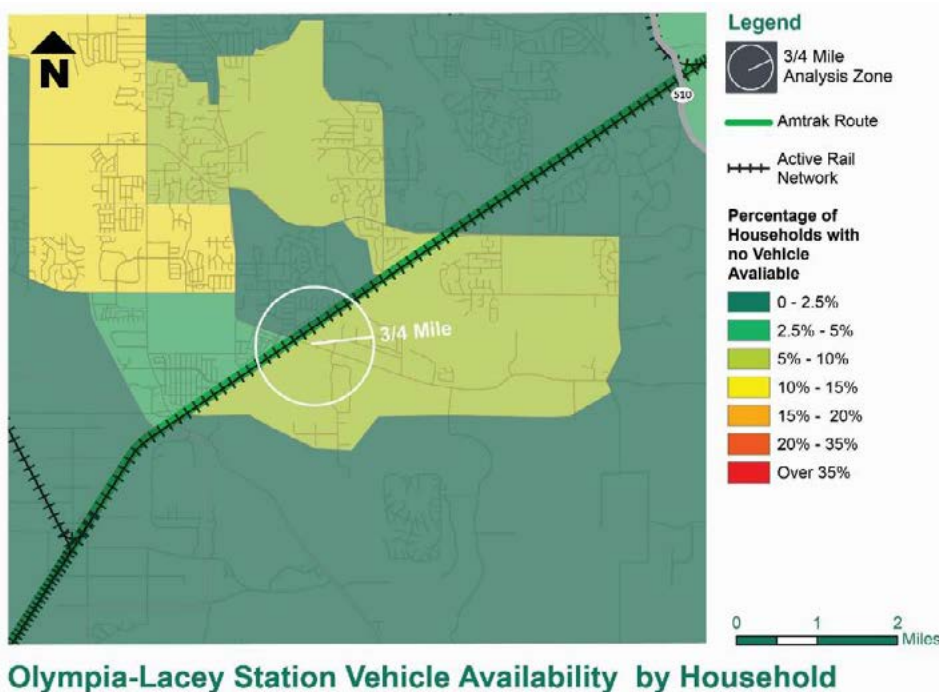
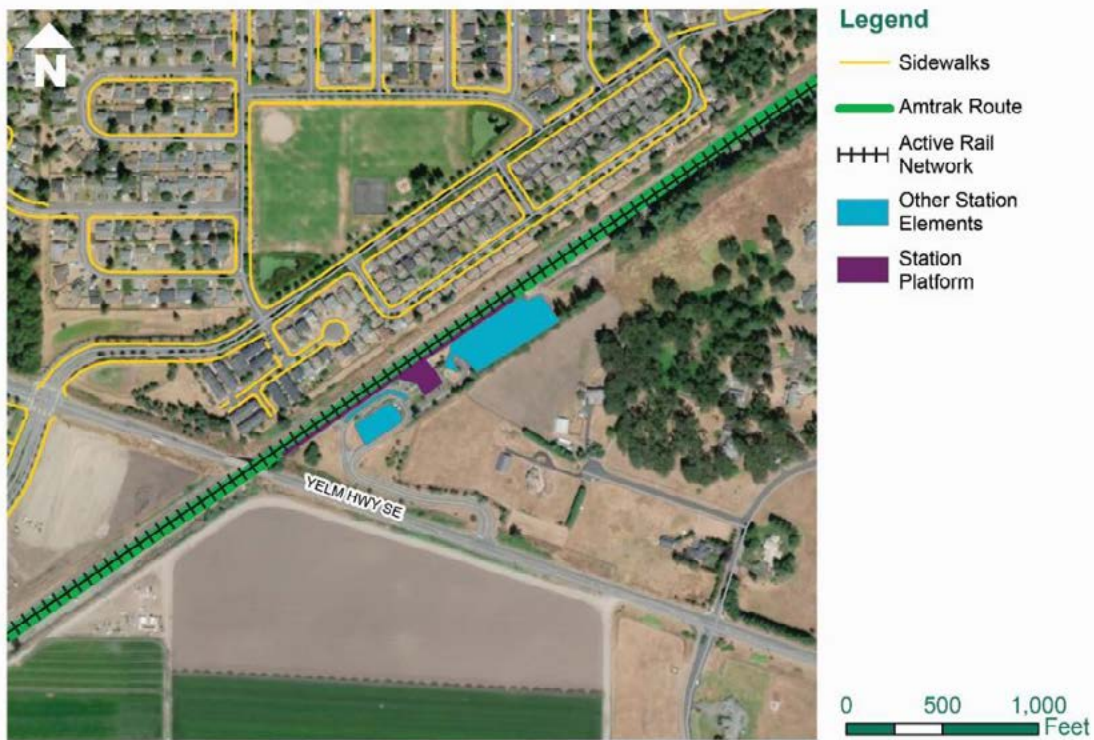


Figure-6: Sidewalks



Olympia-Lacey Station Sidewalks

Figure-7: Bicycle Facilities



Olympia-Lacey Station Bicycle Facilities

Supporting information - photo documentation

Site visits were conducted in Olympia on October 10, 2018 to inventory assets at the station and assess multimodal connections.



Local bus stop shelters and bike rack.



Yellow marked curb for bus routes with wide sidewalks.



Olympia-Lacey Station exterior.



Olympia-Lacey Station interior.

Tacoma, WA

Tacoma Dome Station
 422 E 25th St
 Tacoma, WA 98421

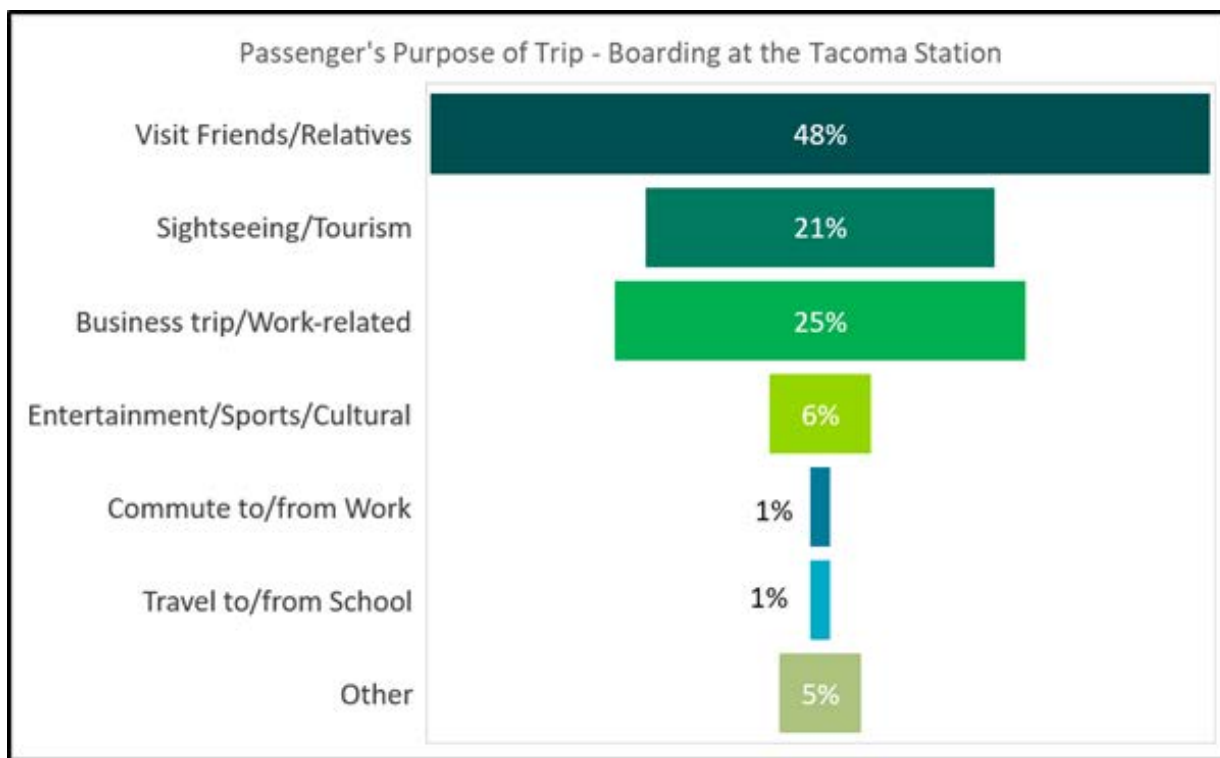


Station overview

Amtrak Cascades service to Tacoma, Washington has been provided from a station located on Puyallup Avenue, but will be moving to Tacoma Dome Station at Freighthouse Square soon. Existing conditions and connectivity were analyzed with respect to the new Tacoma Dome Station location.

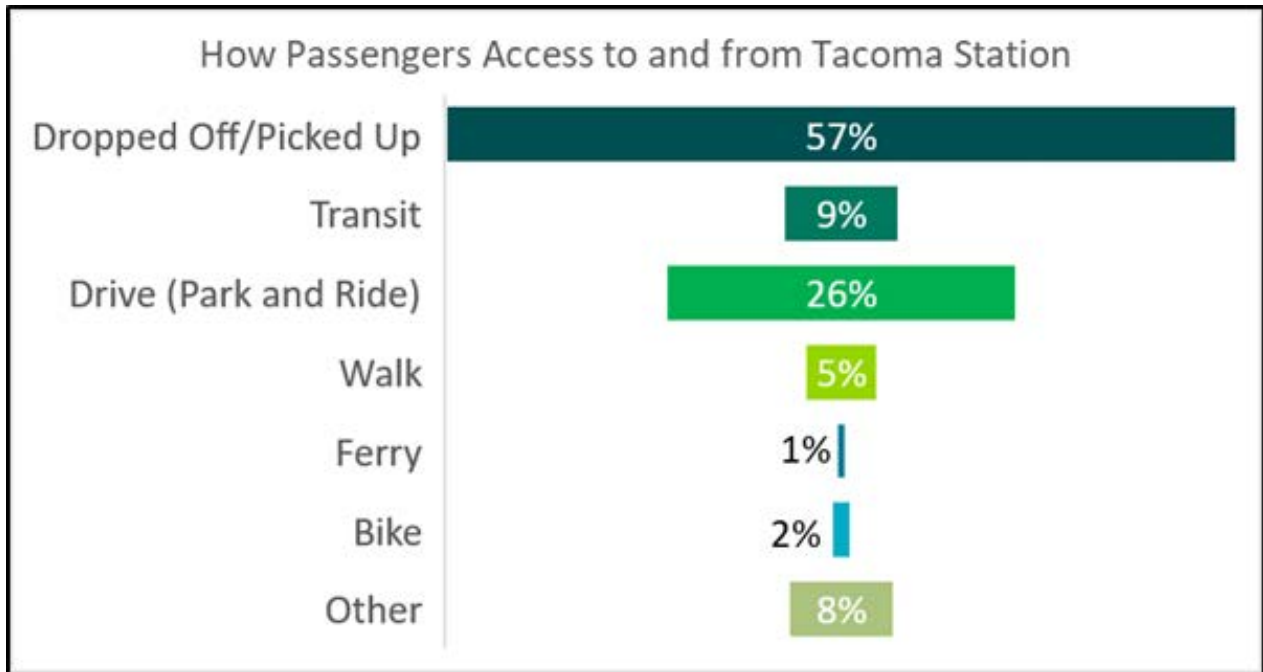
The station served approximately 88,000 passengers in 2017. Trip purpose and mode of access data gathered from a 2018 on-board passenger survey is summarized in Figures 1 and 2. (The on-board survey reached over 1,000 Amtrak Cascades passengers, producing statistically significant results for the corridor. However, at the station level, results may not be statistically significant, particularly at stations with lower ridership.)

Figure-1: Survey Results-Trip Purpose



Note: Survey respondents had the option of selecting more than one response.

Figure-2: Survey Results-Mode of Access



Note: Survey respondents had the option of selecting more than one response.

Parking and drop-off/pick-up

At the new Tacoma Dome station, dedicated long-term parking will not be provided; the large Pierce Transit parking garages across the street from the station do not allow parking for more than 24 hours. There are currently surface lots within the station area that provide paid parking available to the public for short or long-term use. A designated drop-off/pick-up zone is provided in front of the new station on E 25th Street.

Walk and transit access

From a pedestrian standpoint, there is a well-connected sidewalk network for access to downtown Tacoma and the Tacoma Dome. Interstate 5 is a barrier to pedestrian access from neighborhoods south of the station area, and the pedestrian environment to the east of the station reflects its low-density industrial character.

Connections to regional and local transit will be enhanced by the move to the Tacoma Dome Station. The platform and station will be shared with Sounder commuter rail service which serves a corridor from Lakewood to downtown Seattle. Sound Transit plans to increase Sounder service and extend the service south to DuPont by 2036.

The Tacoma Link streetcar connects Tacoma Dome Station to major attractions in downtown Tacoma. It stops across the street from the station entrance on E 25th Street. Sound Transit is currently constructing a 2.5-mile extension to the Hilltop neighborhood (service planned for 2022) and a further extension to Tacoma Community College is planned for completion by 2039.

Intercity, regional express and local bus services are all available within a block of the Tacoma Dome Station.

Sound Transit is expanding its Link Light Rail system south to Tacoma from Seattle, with a station near Tacoma Dome Station. It plans to begin service here by 2030.

Bicycle access

People using bicycles to access the Amtrak Tacoma station have limited options. There are no east/west bicycle lanes in the area. There is a north/south bicycle lane on D Street. There are no bicycle racks or lockers at the station itself, but they are available at the parking garage across E 25th Street from the station.

Connectivity analysis

As shown in Table 1, analysis of land use, mobility and transportation network measures for the Tacoma station yielded a connectivity score of 8.0, of a possible 10 points, indicating only minor gaps in the existing connectivity of the station.

The station achieved high or medium sub-scores in all categories, with particular strengths in the areas of station land use context and transit service.

Table 1. Connectivity Evaluation:		Tacoma			
Categories & Measures	Measures	Maximum Points	Maximum Score	Points	Score
LAND USE	2	6	2	4	1.3
Station Location Context & Attractors		3		2	
Zero Car Household		3		2	
MOBILITY	3	9	3	8	2.7
Transit Service		3		3	
Private Transportation Connection Options		3		3	
Human Services Transportation		3		2	
CONNECTED TRANSPORTATION NETWORK	5	15	5	12	4.0
At-Grade Railroad Crossings		3		2	
Sidewalks		3		3	
Bicycle Facilities		3		2	
Drop-off/Pick-up Areas		3		2	
Wayfinding		3		3	
Station Connectivity-Total	10	30	10	24	8.0

Candidate improvements

Based on the results of the connectivity analysis and field visits, Figure 3 and Table 2 identify candidate pedestrian, bicycle, multimodal and railroad crossing improvements that can be expected to enhance connectivity to the Tacoma Dome Station and promote increased safety for all travel modes.

Figure-3: Candidate Improvements

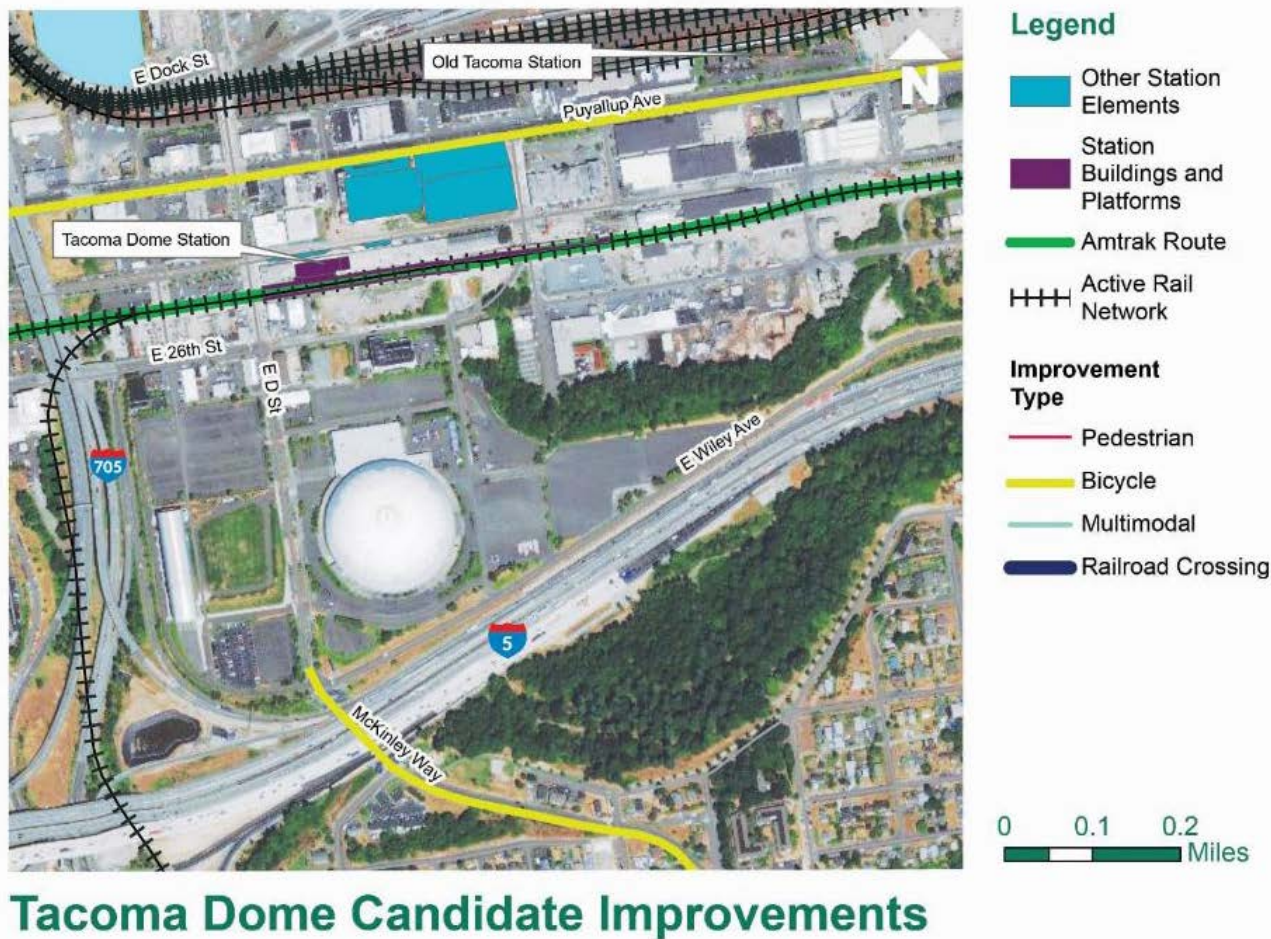


Table 2. Opportunities to Enhance Connectivity at Tacoma Dome Station

Type	Gaps	Candidate Improvement*	Potential Project Examples/ Locations*
Bicycle Lanes	Existing D Street bicycle lane terminates at I-5	Bicycle facility improvements within 1/2-mile radius of station	Extend D street bicycle lane with McKinley Way overpass replacement
Bicycle Lanes	Missing dedicated east-west bicycle connectivity	Bicycle facility improvements within 1/2-mile radius of station	East/west bicycle facilities on routes to be determined
Pedestrian	High volumes of pedestrian volume in area surrounding station	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	Leading pedestrian intervals at intersections with high pedestrian volumes and turning vehicle volumes
Multimodal	Wayfinding signs	Install additional wayfinding signs in station area	Locations to be determined
Pedestrian	Complete sidewalks (curb, gutter, ramps)	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	Sidewalk ramp upgrades to current accessibility guidelines
Transit	None-improvements planned	Additional transit service to station area	Sound Transit is planning, design and building improvements to Tacoma Link, Sounder, and Link Light Rail service to the Tacoma Dome Station

*WSDOT will work with stakeholders to improve access and connectivity to Amtrak Cascades stations. Local jurisdictions, transit agencies, Amtrak and railroads could consider addressing these opportunities when implementing their capital improvement and service development plans; some of the opportunities identified may also be addressed in these existing plans.

Supporting information – connectivity analysis

The summary results and connectivity score for the Tacoma Dome station are supported by geospatial representations of four measured criteria (attractors, zero car households, sidewalks, and bicycle facilities) presented in the figures below and in Table C-1. Multimodal Connectivity Analysis: Observed Data & Assignment of Points.

Figure-4: Station Context-Attractors

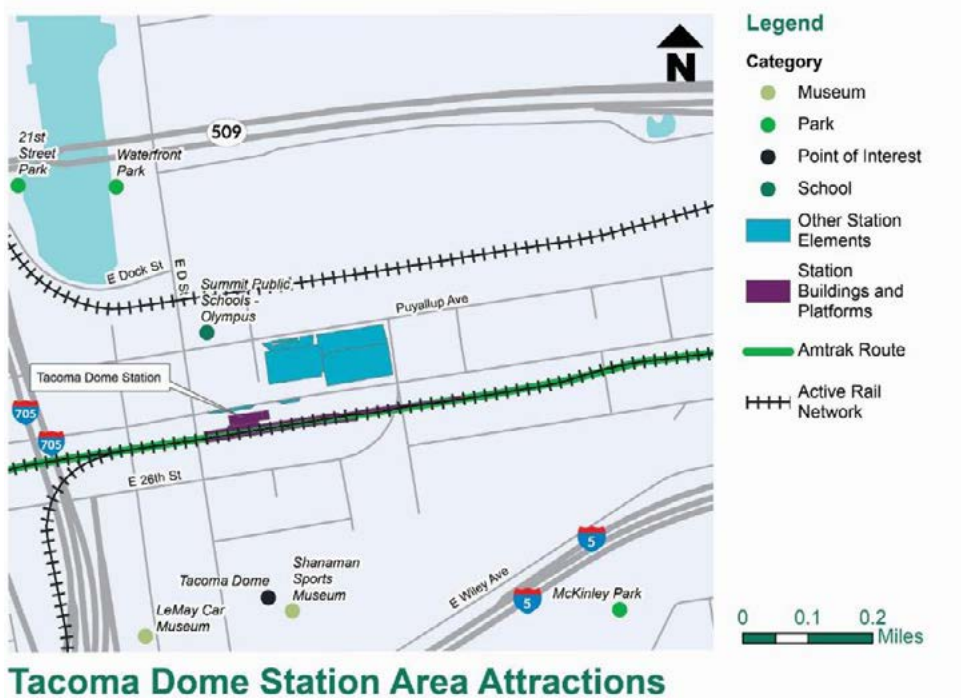


Figure-5: Zero-Car Households

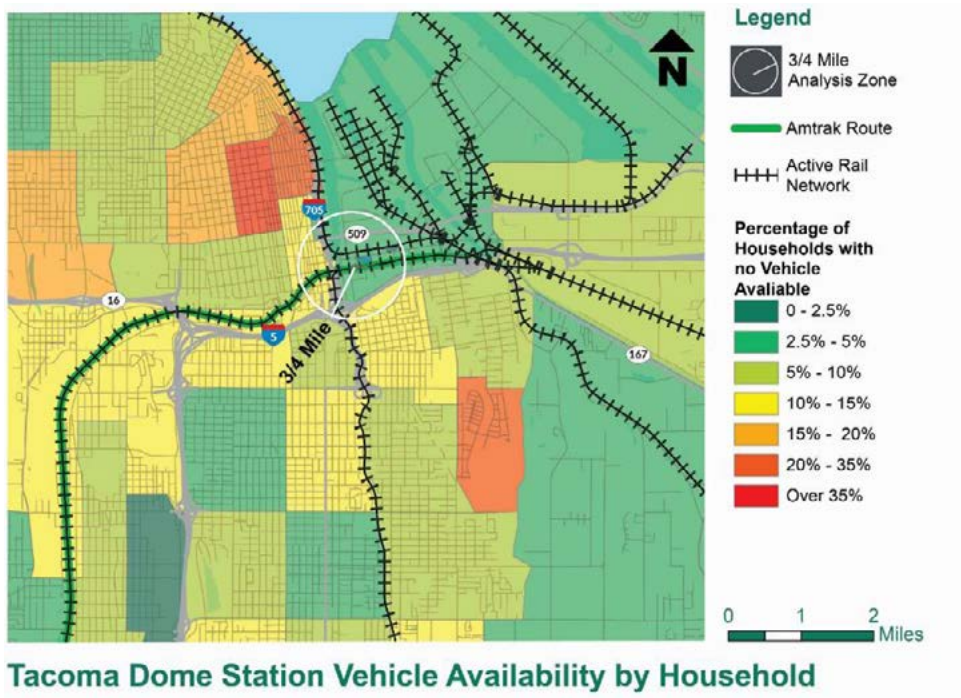


Figure-6: Sidewalks

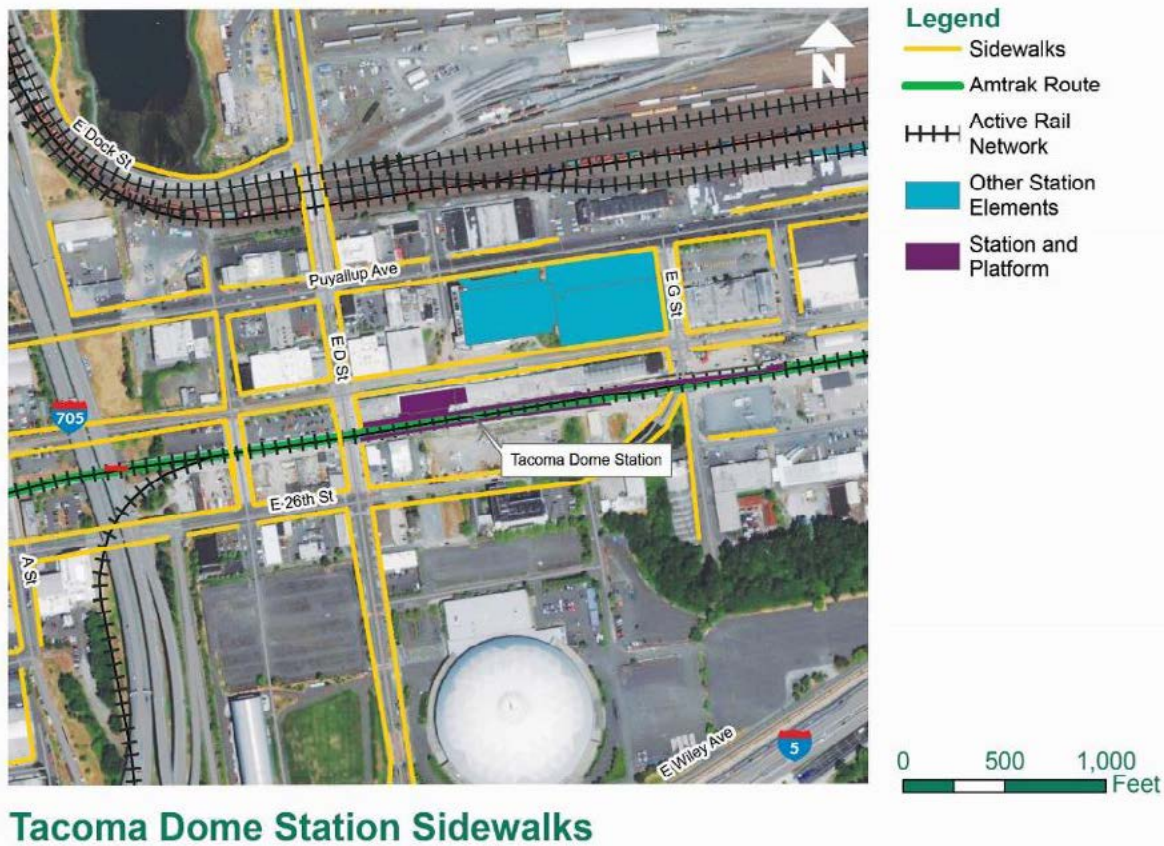
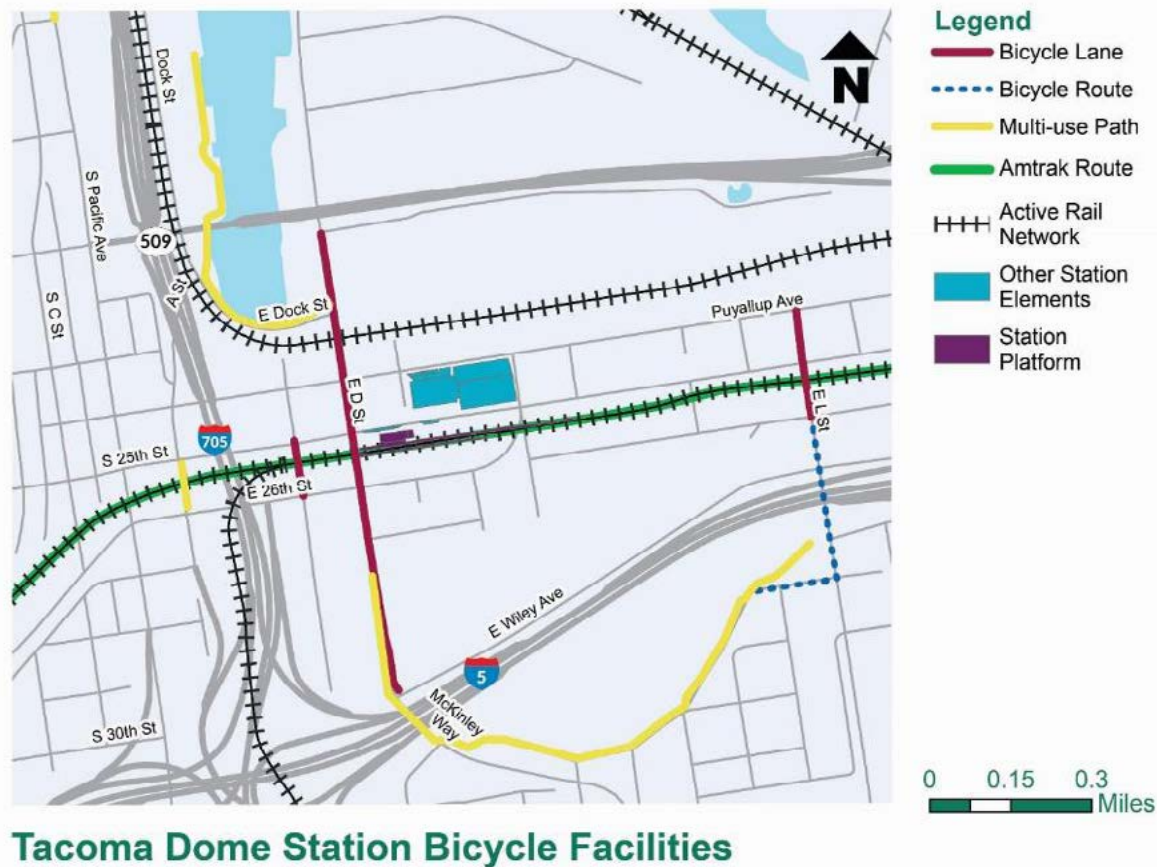


Figure-7: Bicycle Facilities



Tukwila, WA

Tukwila Station
 7301 Longacres Way
 Tukwila, WA 98188

Tukwila, WA
 Tukwila Station
 Connectivity
 Score
6.3

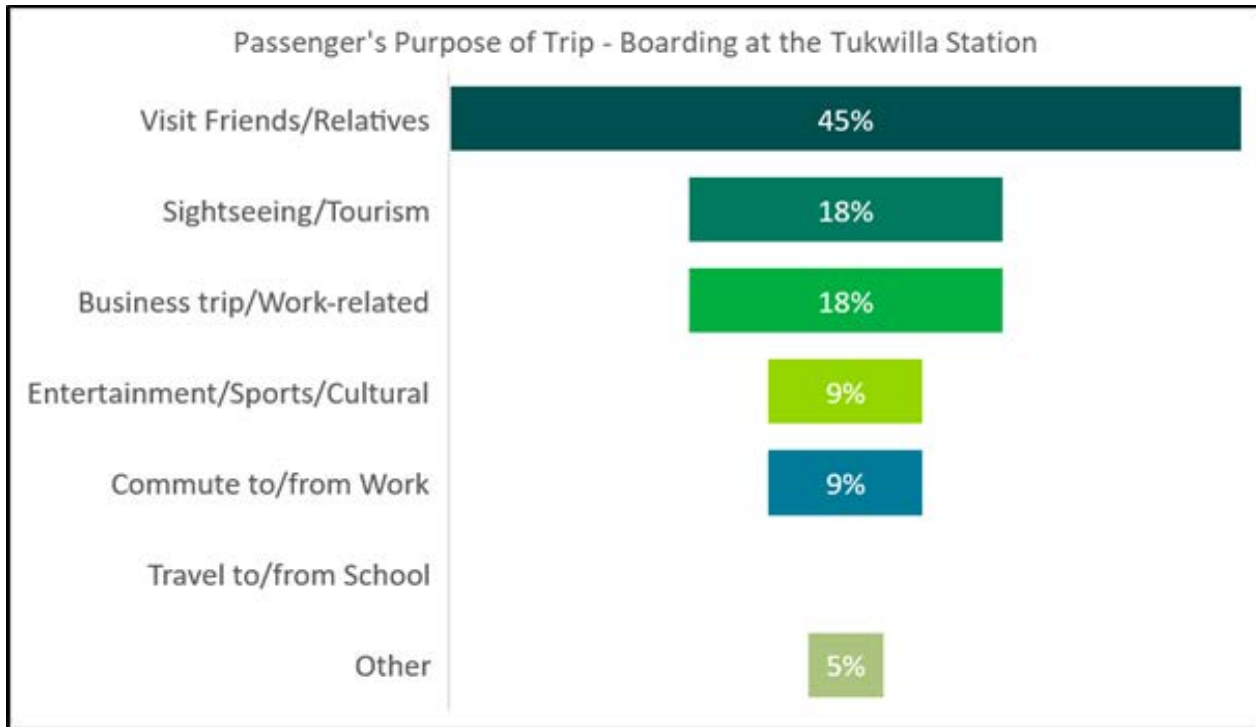


Station overview

The Tukwila Station provides Amtrak Cascades, Sounder commuter rail, and local (bus) transit service. This station, owned and operated by Sound Transit, is located in an area featuring hotels and office uses in a suburban, business-park setting. The nearby Interurban Trail and Green River Trail support multimodal users with connected multi-use paths. A new pedestrian/bicycle bridge over the Green River provides access within a 1/2 mile walking distance to over 2,000 hotel rooms, over 300 new apartments, and employment and shopping opportunities around Westfield Southcenter Mall.

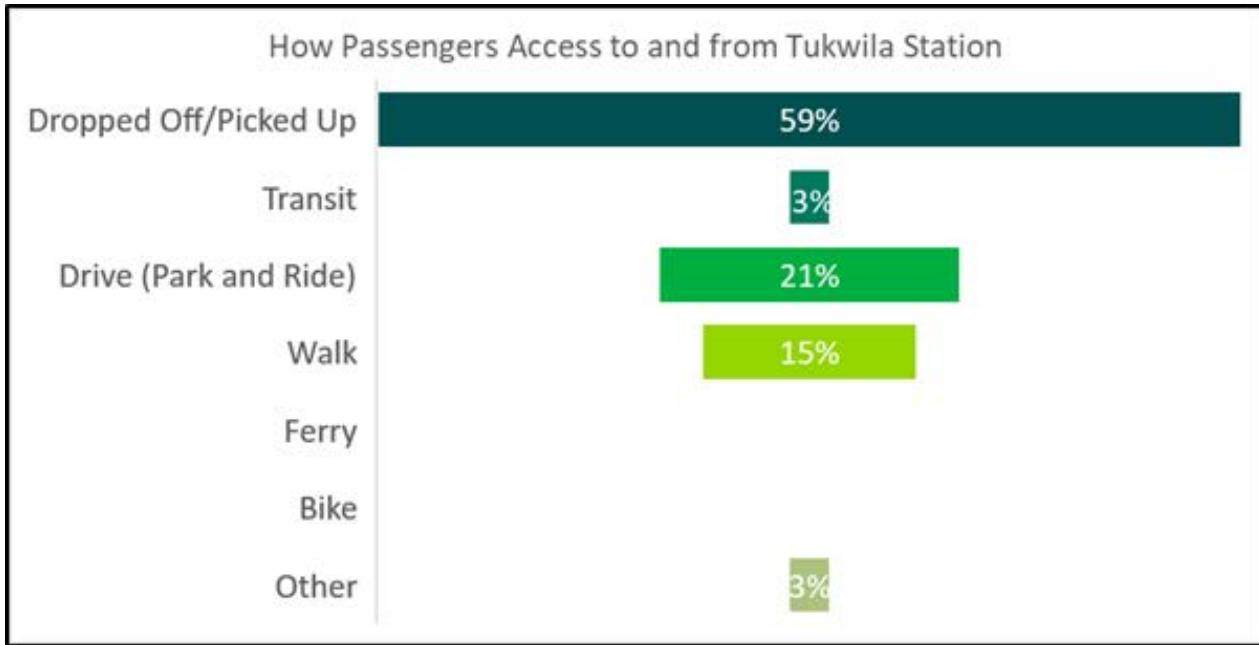
The station served approximately 31,000 passengers in 2017. Trip purpose and mode of access data gathered from a 2018 on-board passenger survey is summarized in Figures 1 and 2. (The on-board survey reached over 1,000 Amtrak Cascades passengers, producing statistically significant results for the corridor. However, at the station level, results may not be statistically significant, particularly at stations with lower ridership.)

Figure-1: Survey Results-Trip Purpose



Note: Survey respondents had the option of selecting more than one response.

Figure-2: Survey Results-Mode of Access



Note: Survey respondents had the option of selecting more than one response.

Parking and drop-off/pick-up

A total of 350 parking spaces, including dedicated accessible parking spaces and electric vehicle charging stations, are provided for Sounder and transit patrons in a surface parking lot. There are 20 spaces designated for use by Amtrak patrons. The parking lot has clearly marked pedestrian sidewalks that lead foot traffic from the parking to a wide sidewalk for station access.

Additionally, there is a dedicated area for drop-off/pick-up (use for taxi, transportation network companies, or human services transportation) and is clearly signed. This station has a marked drop-off/pick-up area for people with disabilities placed in close proximity to the station platform and passenger amenities.

Walk and transit access

The Tukwila Station is located in an auto-oriented business park area. Recently constructed improvements that enhance pedestrian access include a pedestrian and bicycle bridge across the Green River, an enhanced multimodal trail on Christensen Road, and wayfinding to provide a shortened connection between the west side of SR 181 just south of Longacres Way and the Southcenter Urban Center area. A pedestrian can access the station via Longacres Way as it has a sidewalk on one side of the road. It also connects to SR 181 (West Valley Highway) that has sidewalks. Additionally, passengers can use either of two shared use paths to access Boeing and Kaiser Permanente business campuses that are east and southeast of the station. Pedestrian access is provided via an underpass of the railroad tracks on Longacres Way that connects to the shared used path. To access the Tukwila station from the south, the Tukwila access road does not provide sidewalks, relying on a shared-use path for non-vehicular access.

The wayfinding signs have been upgraded and provide clear direction for all different users: pedestrians, human services transportation services, bicyclists, drivers, and connecting transit services.

Sound Transit’s Sounder commuter rail service is available at the shared passenger rail platform. Sound Transit plans to increase Sounder service and capacity with platform, track and signal improvement funded through the ST3 program. Connections to local/regional bus service are located within the station, providing a seamless trip transition. Benches and shelters are provided at both the train and bus platforms.

Bicycle access

People using bicycles to access the Tukwila station may use the Interurban Trail; Green River Trail; or Springbrook Trail, which are all within a 1/4-1/2 miles of the station, but have limited options within the immediate station area. There are no dedicated bicycle facilities on any of the streets in the area, though Longacres Way is marked as a bike route from the station to the intersection with the Interurban Trail. The Interurban Trail connects Tukwila with communities to the south such as Kent and Auburn. There is a shared use pathway connecting to the Boeing and Kaiser Permanente business campuses east of the station, and there are bicycle racks and bike lockers at the station.

Connectivity analysis

As shown in Table 1, analysis of land use, mobility and transportation network measures for the Tukwila station yielded a connectivity score of 6.3, of a possible 10 points, indicating significant gaps in the existing connectivity of the station.

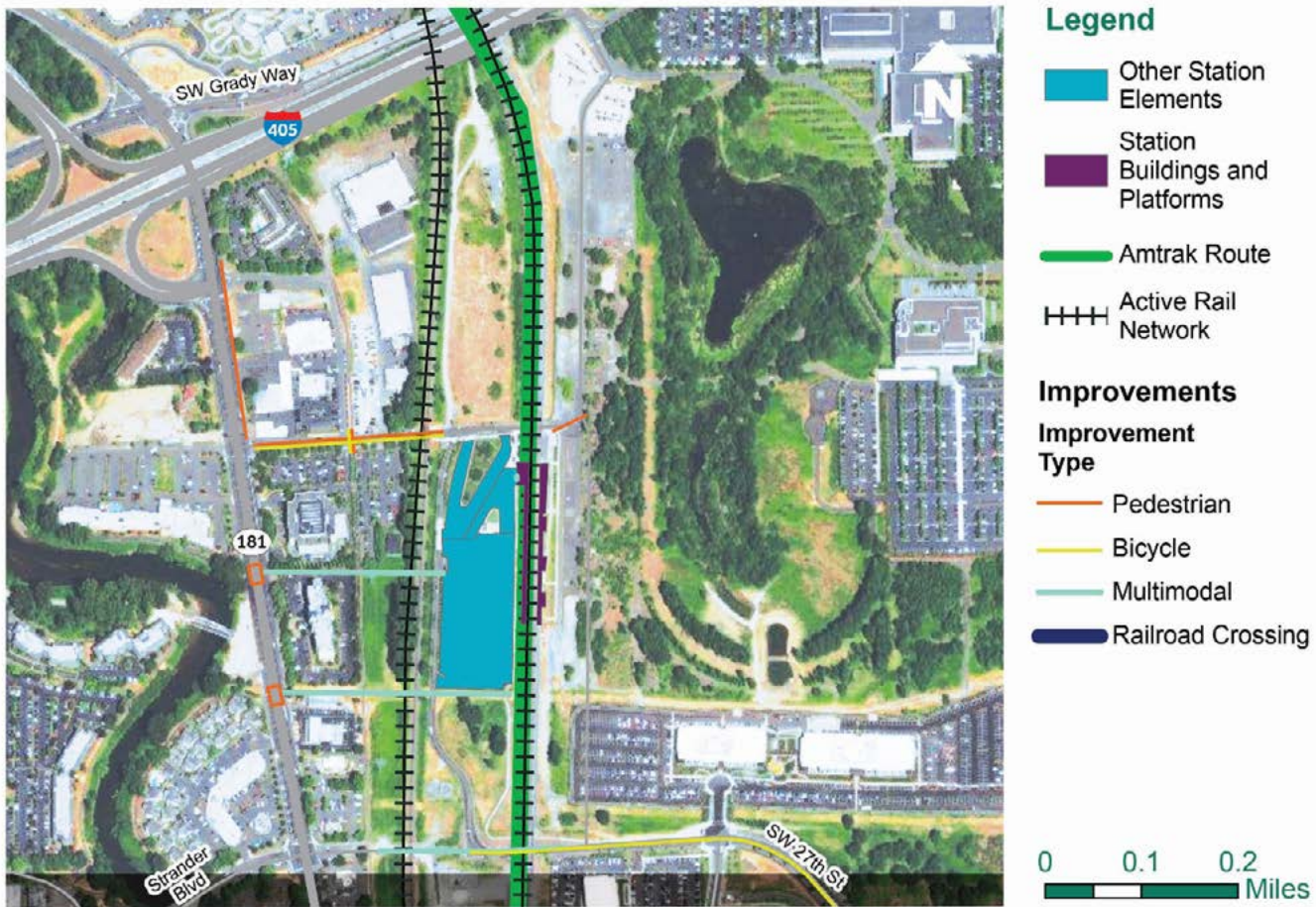
The station achieved high sub-scores in the two categories: the number of at-grade railroad crossings (the higher the score, the lower amount of at grade railroad crossings), and the area to drop-off/pick-up passengers. The analysis also highlights access issues surrounding the Tukwila station that include: a low number of transportation connectivity options, a lower number of connecting transit routes, and wayfinding signs.

Table 1. Connectivity Evaluation:		Tukwila			
Categories & Measures	Measures	Maximum Points	Maximum Score	Points	Score
LAND USE	2	6	2	4	1.3
Station Location Context & Attractors		3		2	
Zero Car Household		3		2	
MOBILITY	3	9	3	4	1.3
Transit Service		3		1	
Private Transportation Connection Options		3		1	
Human Services Transportation		3		2	
CONNECTED TRANSPORTATION NETWORK	5	15	5	11	3.7
At-Grade Railroad Crossings		3		3	
Sidewalks		3		2	
Bicycle Facilities		3		2	
Drop-off/Pick-up Areas		3		3	
Wayfinding		3		1	
Station Connectivity-Total	10	30	10	19	6.3

Candidate improvements

Based on the results of the connectivity analysis and field visits, Figure 3 and Table 2 identify candidate pedestrian, bicycle, multimodal and railroad crossing improvements that can be expected to enhance connectivity to the Tukwila station and promote increased safety for all travel modes. These candidate improvements, including potential project examples and/or locations, were identified based on the system-wide candidate improvement types, analysis of existing connectivity gaps, and site visits. These representative examples may include facilities owned by the State, Amtrak, railroads or local agencies. WSDOT will further evaluate the viability of the opportunities identified here to improve state facilities for better access to Amtrak Cascades stations. Amtrak, railroads and local agencies can consider implementing improvements to their facilities and operations, similar to these representative examples, as they develop their capital improvement and service plans.

Figure-3: Candidate Improvements



Tukwila Station Candidate Improvements

Table 2. Opportunities to Enhance Connectivity at Tukwila Station

Type	Gaps	Candidate Improvement*	Potential Project Examples/ Locations*
Multimodal	Strander Boulevard does not connect to 27th Street	Pedestrian and bicycle facility improvements within station area	Connect Strander Boulevard to 27th Street under UP railroad track
Pedestrian	Complete sidewalks (curb, gutter, ramps)	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	Add sidewalks and lighting to Longacres Way; complete sidewalk network on West Valley Highway
Pedestrian and Bicycle	Miscellaneous	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	Improve lighting, wayfinding, signage and markings on Interurban Trail at Longacres Way
Bicycle	Bicycle lanes	Bicycle facility improvements within 1/2-mile radius of station	Upgrade from sharrows to bike lanes on Longacres Way

*WSDOT will work with stakeholders to improve access and connectivity to Amtrak Cascades stations. Local jurisdictions, transit agencies, Amtrak and railroads could consider addressing these opportunities when implementing their capital improvement and service development plans; some of the opportunities identified may also be addressed in these existing plans.

Supporting information - connectivity analysis

The summary results and connectivity score for the Tukwila station are supported by geospatial representations of four measured criteria (attractors, zero car households, sidewalks, and bicycle facilities) presented in the figures below and in Table C-1. Multimodal Connectivity Analysis: Observed Data & Assignment of Points.

Figure-4: Station Context-Attractors



Figure-5: Zero-Car Households

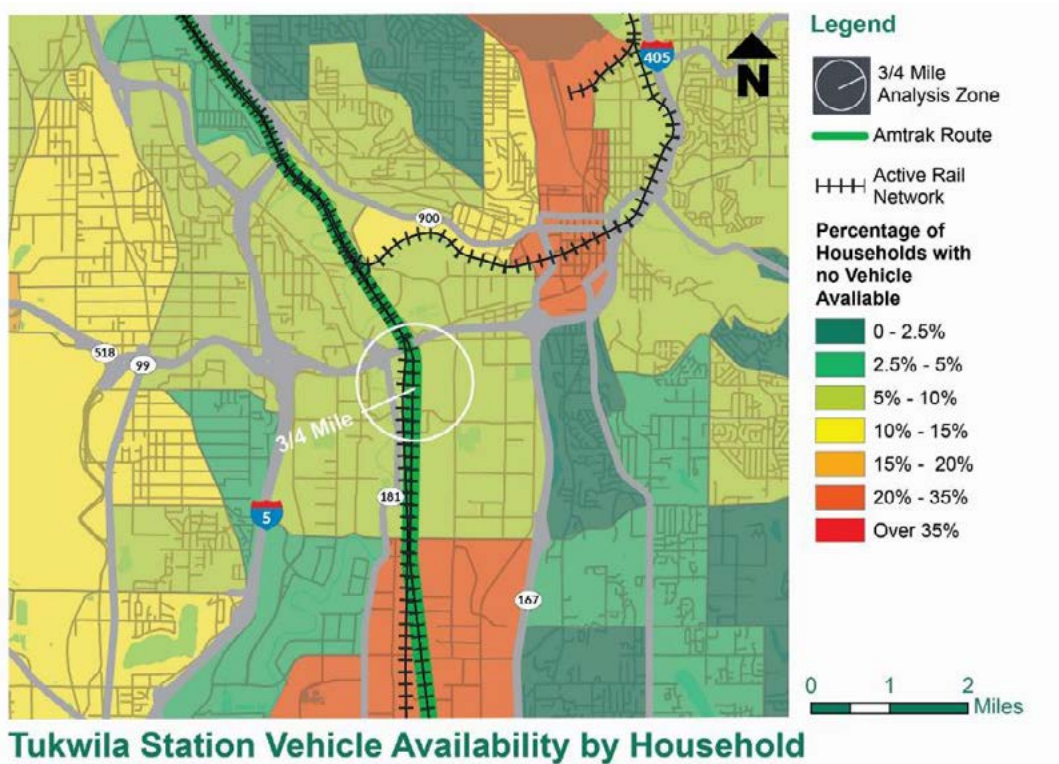


Figure-6: Sidewalks

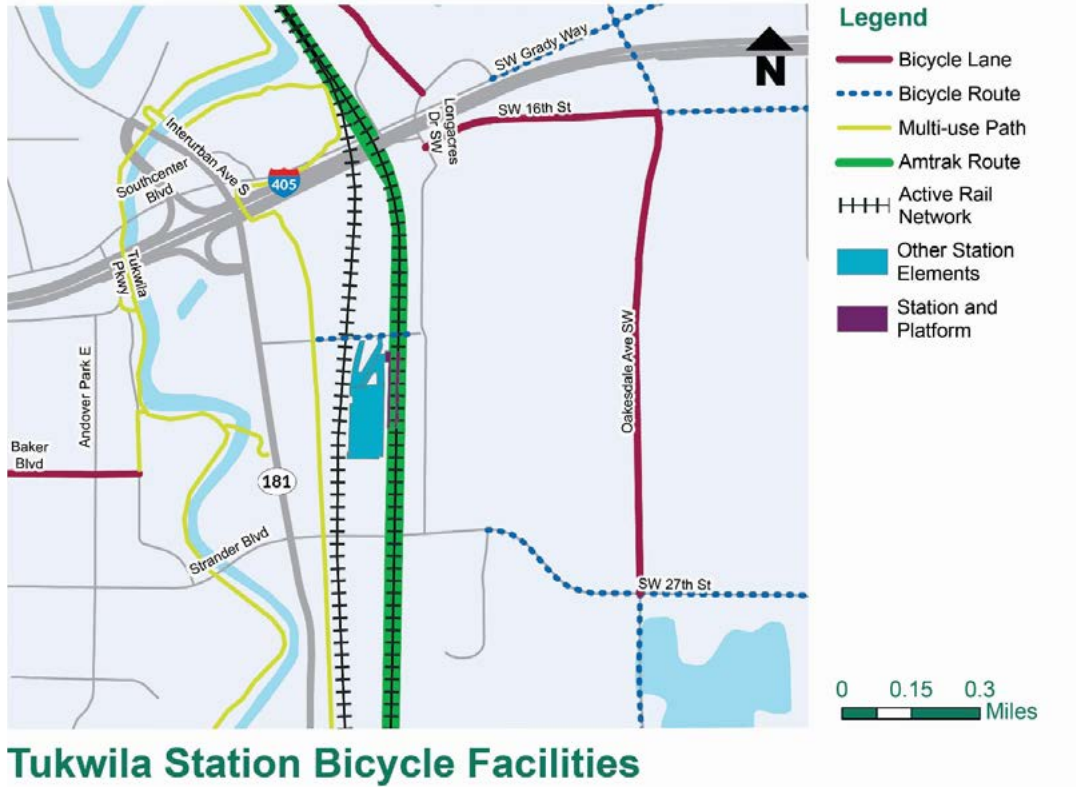
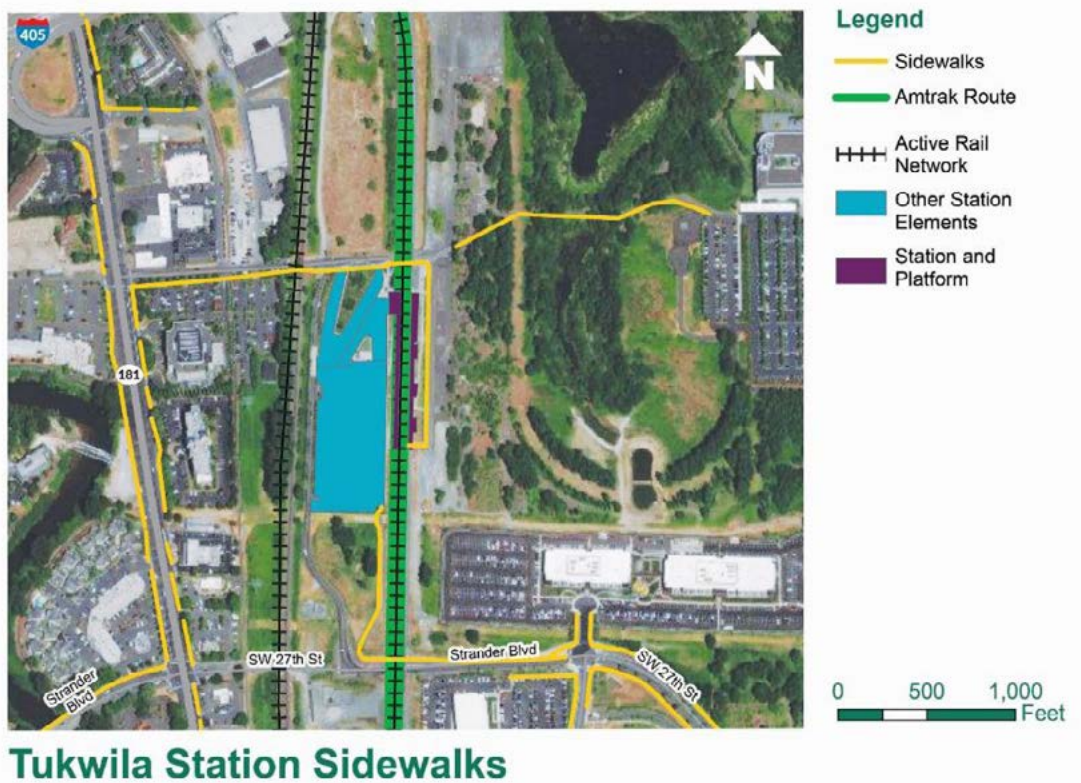


Figure-7: Bicycle Facilities



Supporting information - photo documentation

Site visits were conducted on October 10, 2018 to inventory assets at the station and assess multimodal connections.



Amtrak customer only parking.



Tukwila Station wayfinding signs.



Tukwila Station platform and RR tracks.



Tukwila Station information board.



ADA ramp and striping.



RapidRide bus leaving the station.

Seattle, WA

Seattle King Street Station
 303 S Jackson St
 Seattle, WA 98104

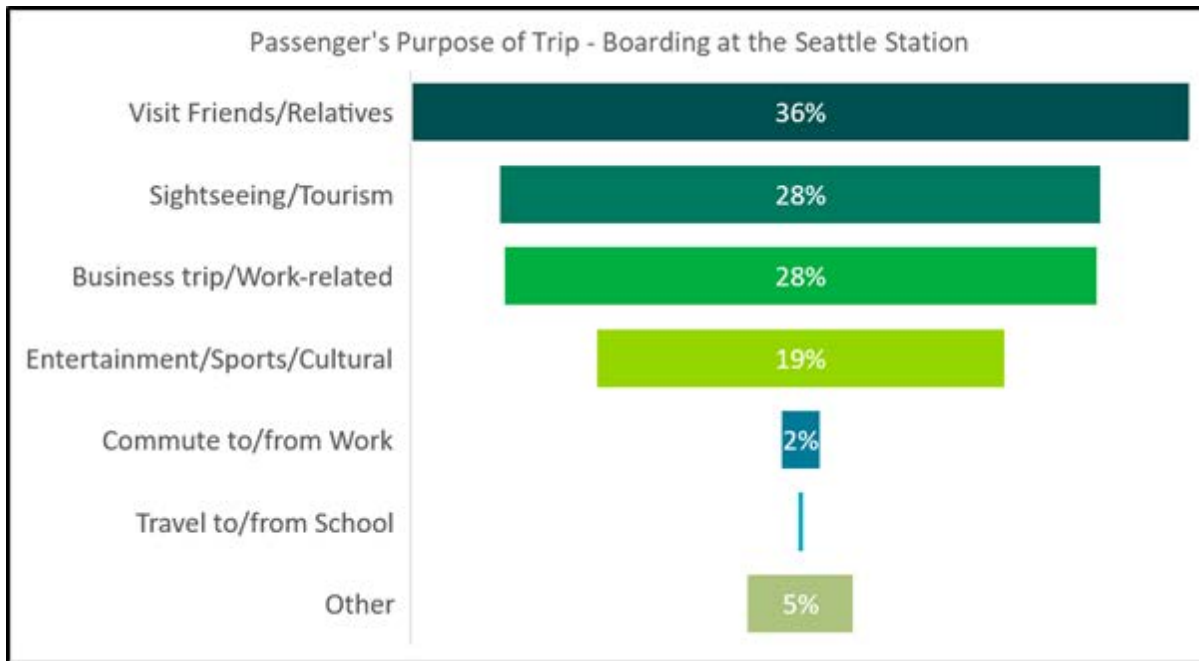


Station overview

Amtrak service is provided at King Street Station, located in downtown Seattle in the historic Pioneer Square district. The station is a landmark on the National Register of Historic Places, and was extensively renovated in 2014 by the owner, the City of Seattle, through a funding partnership with WSDOT and the Federal Railroad Administration. The station location is adjacent to the Chinatown-International District, and within walking distance of sports and events facilities hosting the National Football League, Major League Soccer, Major League Baseball, and concerts and trade shows. The station area features transit connections to a wide variety of local and regional destinations via light rail, commuter rail, streetcar, express bus and local bus service. The area also features dense commercial and residential development and is characterized by high pedestrian and bicycle travel volumes.

The station served over 480,000 passengers in 2017. Trip purpose and mode of access data gathered from a 2018 on-board passenger survey is summarized in Figures 1 and 2

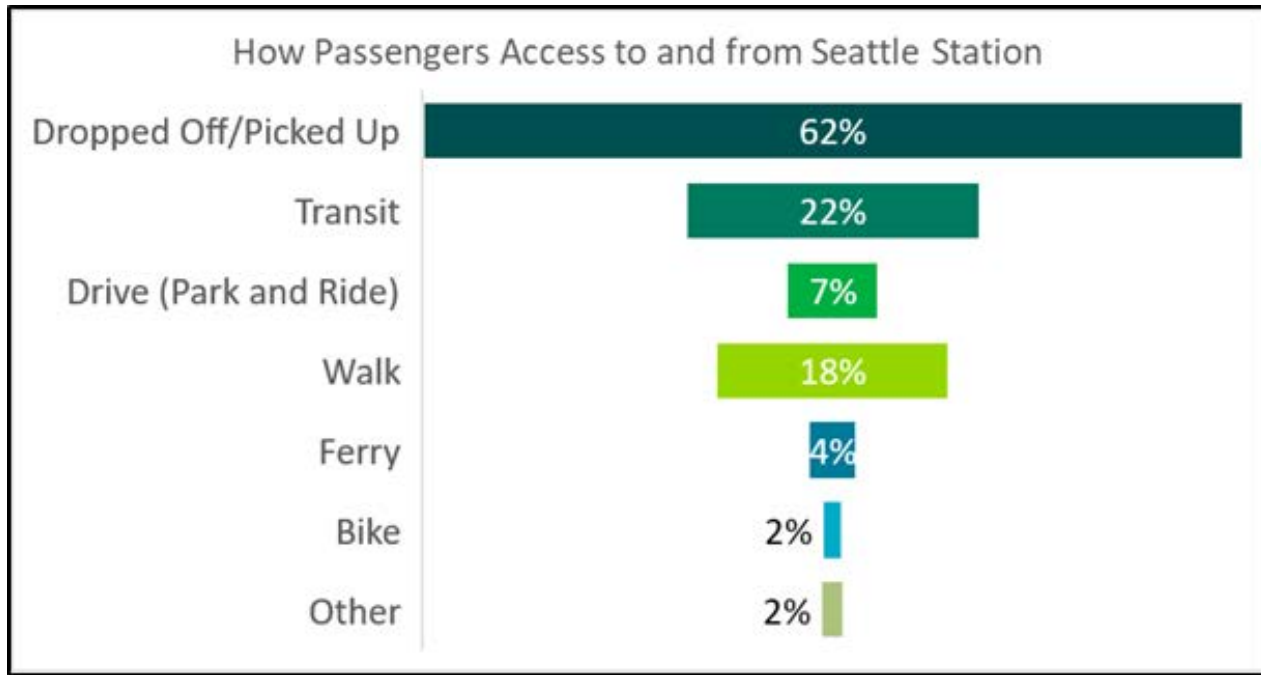
Figure-1: Survey Results-Trip Purpose



Note: Survey respondents had the option of selecting more than one response.

Figure-2: Survey Results-Mode of Access

Note: Survey respondents had the option of selecting more than one response.



Parking and drop-off/pick-up

King Street Station does not offer on-site parking for Amtrak passengers; there are accessible surface parking spaces at the station, and paid parking is available to the public at several garages in the immediate vicinity of the station.

There is an area for drop-off/pick-up (use for taxi, transportation network companies, or human services transportation) that has minimal signage at the front of the station. There is a small section of curb that is painted yellow and marked with signs for taxis, but other curbside areas in front of the station are not clearly marked or signed for designated uses.

Walk and transit access

From a pedestrian standpoint, King Street Station is in the midst of a walkable and transit-rich environment. Sidewalks are wide and available on all streets in the station area. Pedestrians can access the station at the Jackson Street level, where there is access to transit, or at the King Street level, where drop-off is available. While there are numerous roadway crossings, they are all marked and/or signalized. Additionally, the roadways in the area of the King Street Station are elevated over the railroad lines, so there are no at-grade pedestrian crossings. There are also grade separated pedestrian walkways between 4th Avenue and the Amtrak station.

Connections to local/regional bus service, Sounder Commuter Rail service, Greyhound bus service, and Link light rail service are located near the Amtrak station. The Sounder Commuter Rail service can be accessed at the King Street station via an elevated walkway over the railroad tracks. Sound Transit plans to increase Sounder service and capacity with platform, track and signal improvement funded through the ST3 program. The Link light rail and local transit bus station (the south end of the Seattle transit tunnel) is focused east of this heavy rail facility at the Chinatown/International District Station. The Bolt bus stops are about 3-4 blocks south of Jackson on 5th Street. The connection to Greyhound buses is south of the station and close to the Stadium station of the Link light rail.

King Street Station is also located in between two of the Seattle Streetcar stops, just a few blocks away. There are ample wayfinding signs and information kiosks in the station area with information presented to pedestrians, which helps passengers make connections easier.

Bicycle access

People using bicycles to access the King Street station have multiple route options, with a place to lock bicycles to support this connection. There is one marked bicycle lane on 3rd Avenue that is in the King Street station area, and there are bicycle “sharrow” markings to indicate share use with bicycles on Jackson Street, 1st Avenue, a section of 4th Avenue, and a section of 5th Avenue north of the station. The City of Seattle has also installed a two-way protected bicycle lane on 2nd Avenue, extends through downtown Seattle to within one block of the Jackson Street entrance to the station.

Connectivity analysis

As shown in Table 1, analysis of land use, mobility and transportation network measures for the King Street station yielded a connectivity score of 9.0, of a possible 10 points, indicating only minor gaps in the existing connectivity of the station.

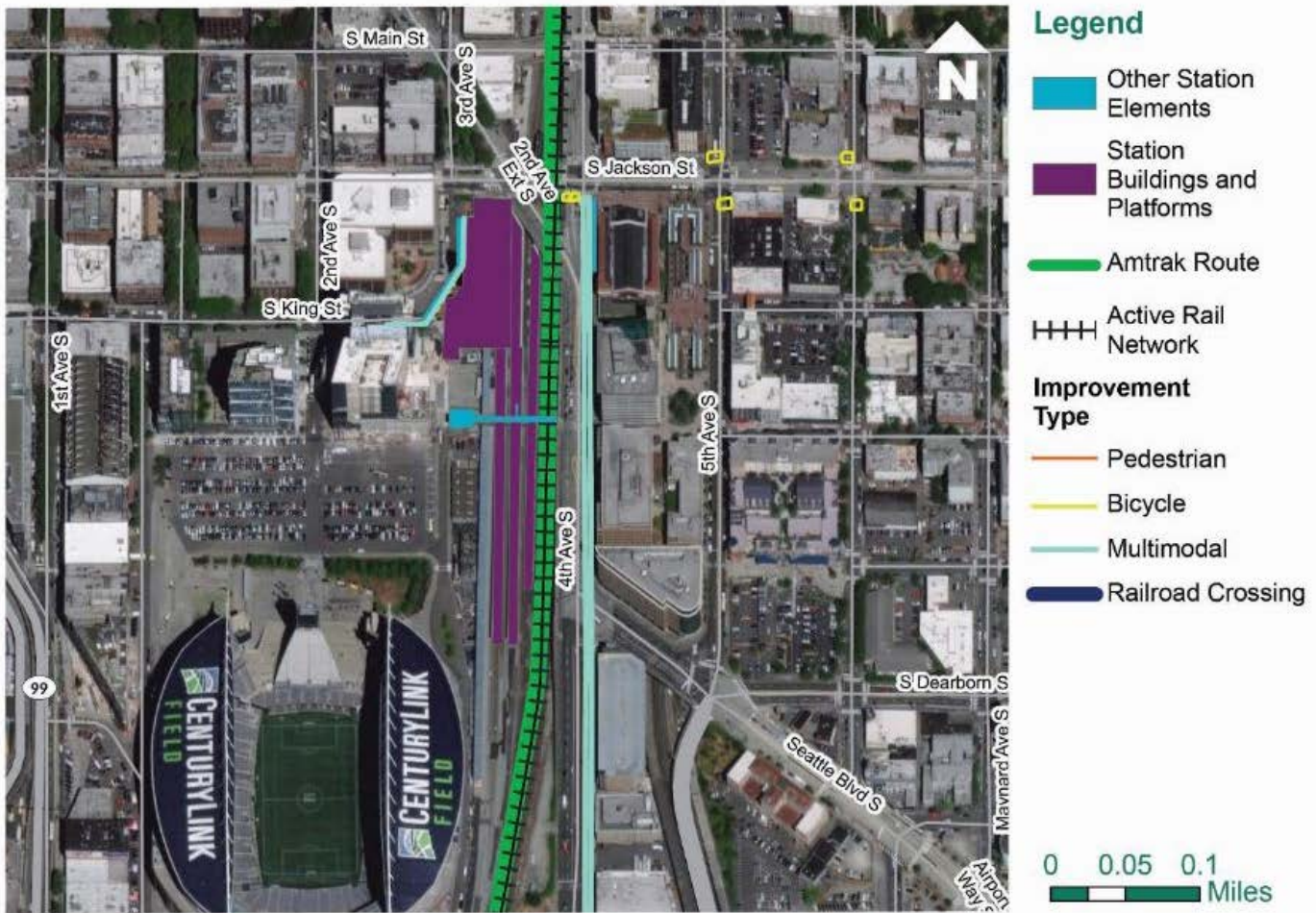
The station achieved high or medium sub-scores in all of the evaluation categories.

Table 1. Connectivity Evaluation:		Seattle			
Categories & Measures	Measures	Maximum Points	Maximum Score	Points	Score
LAND USE	2	6	2	6	2.0
Station Location Context & Attractors		3		3	
Zero Car Household		3		3	
MOBILITY	3	9	3	7	2.3
Transit Service		3		3	
Private Transportation Connection Options		3		2	
Human Services Transportation		3		2	
CONNECTED TRANSPORTATION NETWORK	5	15	5	14	4.7
At-Grade Railroad Crossings		3		3	
Sidewalks		3		3	
Bicycle Facilities		3		3	
Drop-off/Pick-up Areas		3		2	
Wayfinding		3		3	
Station Connectivity-Total	10	30	10	27	9.0

Candidate improvements

Based on the results of the connectivity analysis and field visits, Figure 3 and Table 2 identify candidate pedestrian, bicycle, multimodal and railroad crossing improvements that can be expected to enhance connectivity to King Street Station and promote increased safety for all travel modes. These candidate improvements, including potential project examples and/or locations, were identified based on the system-wide candidate improvement types, analysis of existing connectivity gaps, and site visits. These representative examples may include facilities owned by the State, Amtrak, railroads or local agencies. WSDOT will further evaluate the viability of the opportunities identified here to improve state facilities for better access to Amtrak Cascades stations. Amtrak, railroads and local agencies can consider implementing improvements to their facilities and operations, similar to these representative examples, as they develop their capital improvement and service plans.

Figure-3: Candidate Improvements



Seattle (King Street) Station Candidate Improvements

Table 2. Opportunities to Enhance Connectivity at King Street Station			
Type	Gaps	Candidate Improvement*	Potential Project Examples/ Locations*
Multimodal	Designated drop-off/pick-up area	Signage, striping, and additional designated drop-off/pick-up area for accessible/disabled transportation, either on-site or on-street at station areas	Improve signage and markings at station frontage
Bicycle	Two-stage left turn bike box placement “outside” of crosswalk introduces additional bicycle/pedestrian conflict opportunities	Bicycle facility improvements within 1/2-mile radius of station	Upgrade bike-box treatments
Pedestrian	High volumes of pedestrian volume in area surrounding station	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	Leading pedestrian intervals at intersections with high pedestrian volumes and turning vehicle volumes
Multimodal	Wayfinding signs	Install additional wayfinding signs in station area	Identify accessible routes, including at drop-off areas
Pedestrian	Complete sidewalks (curb, gutter, ramps)	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	Sidewalk ramp upgrades to current accessibility guidelines; gradient lighting of access routes

*WSDOT will work with stakeholders to improve access and connectivity to Amtrak Cascades stations. Local jurisdictions, transit agencies, Amtrak and railroads could consider addressing these opportunities when implementing their capital improvement and service development plans; some of the opportunities identified may also be addressed in these existing plans.

Supporting information - connectivity analysis

The summary results and connectivity score for the Seattle King Street station are supported by geospatial representations of four measured criteria (attractors, zero car households, sidewalks, and bicycle facilities) presented in the figures below and in Table C-1. Multimodal Connectivity Analysis: Observed Data & Assignment of Points.

Figure-4: Station Context-Attractors

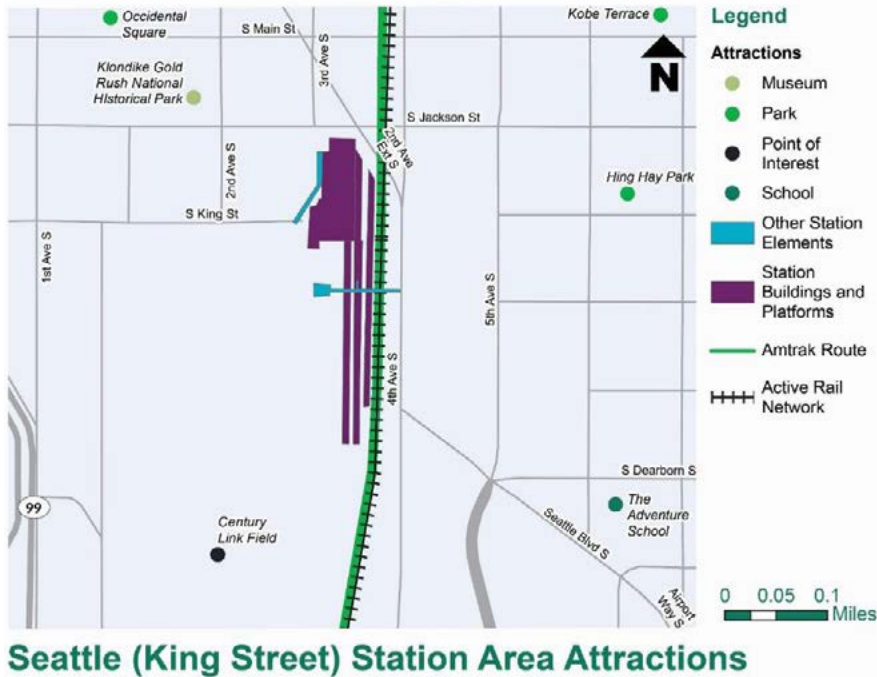


Figure-5: Zero-Car Households

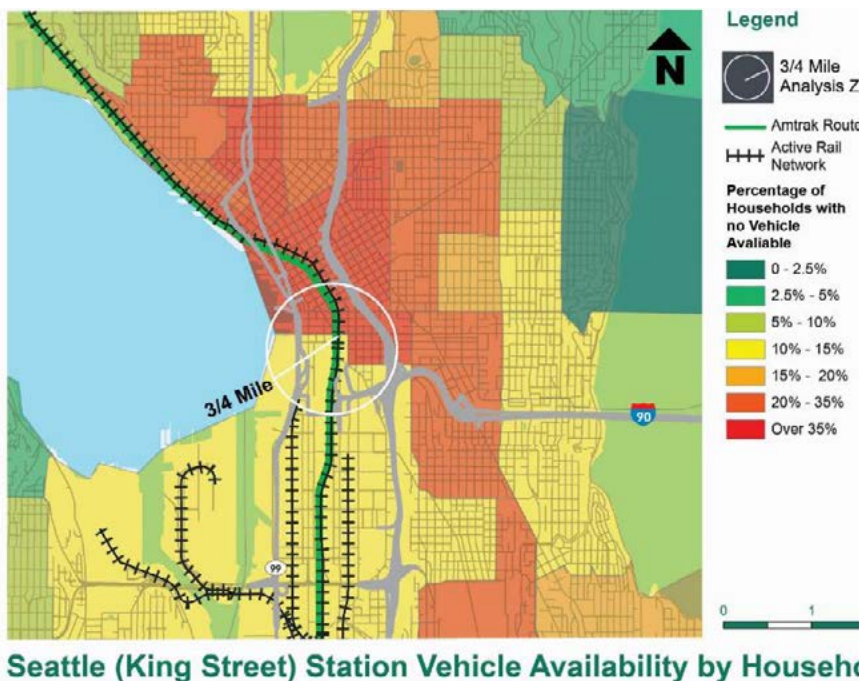


Figure-6: Sidewalks

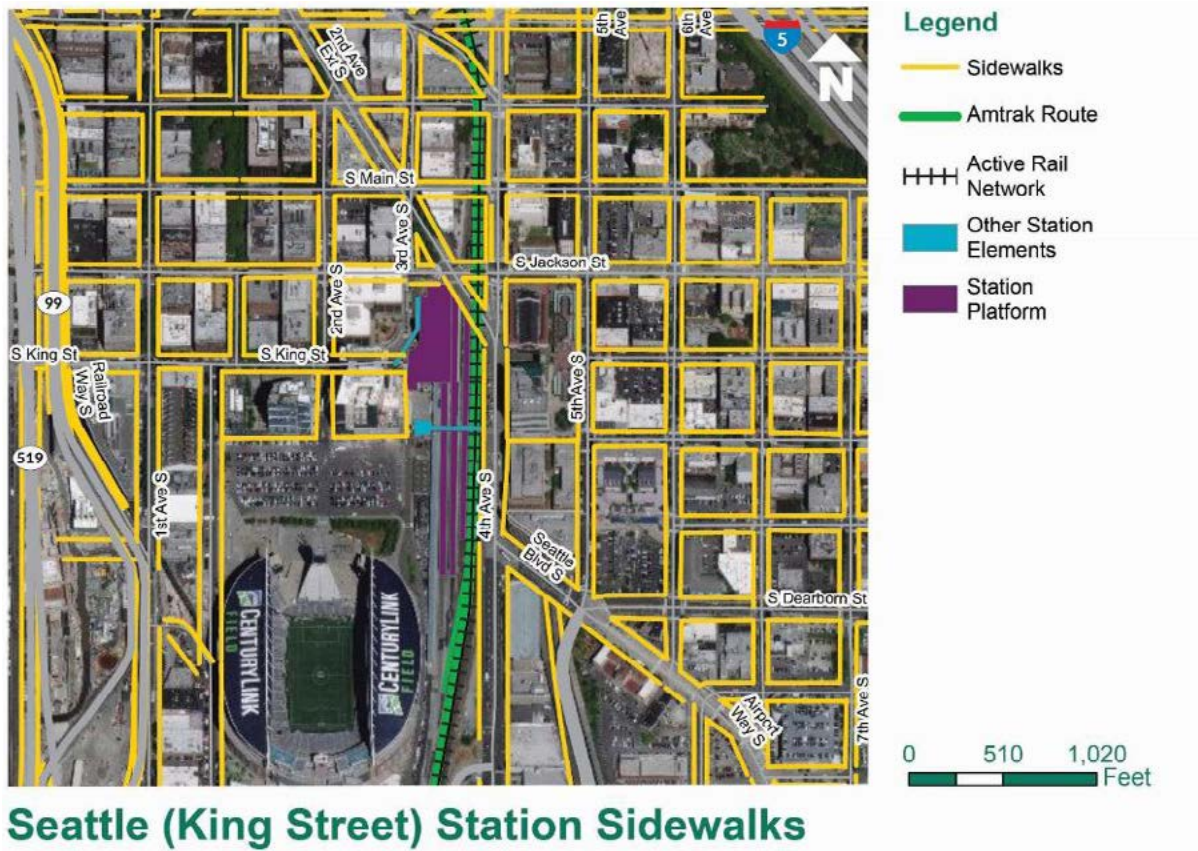
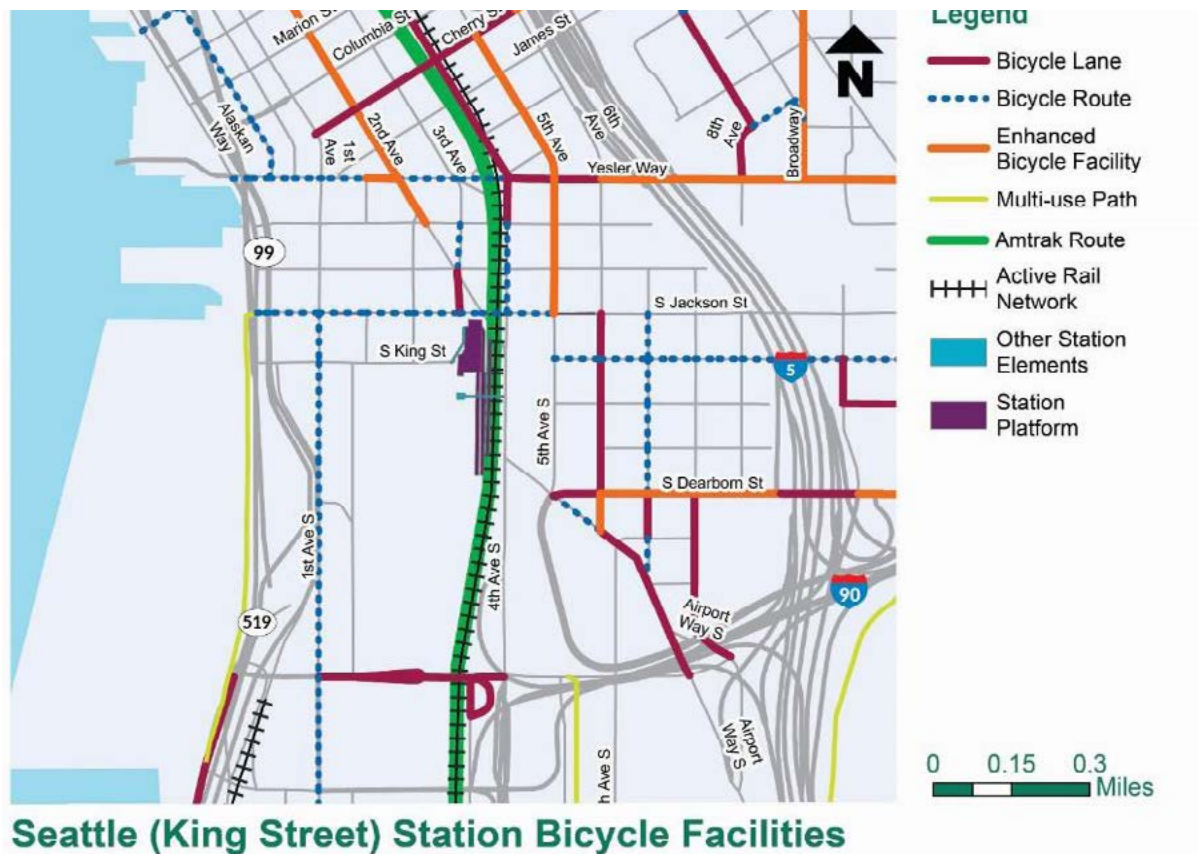


Figure-7: Bicycle Facilities



Supporting information - photo documentation

Site visits were conducted in Seattle on October 10, 2018 to inventory assets at the station and assess multimodal connections.



Unsigned, unclear markings for drop-off/pick-up area at King Street entrance.



Short term parking for drop-off / pick-up.



Looking east on Jackson at 5th Avenue.



Light Rail station entry way; 1-2 blocks from Amtrak station.



Jackson Street crossing 2nd Avenue.



Wayfinding and information transportation kiosk inside Amtrak station.

Edmonds, WA

Edmonds Station
 211 Railroad Ave
 Edmonds, WA 98020

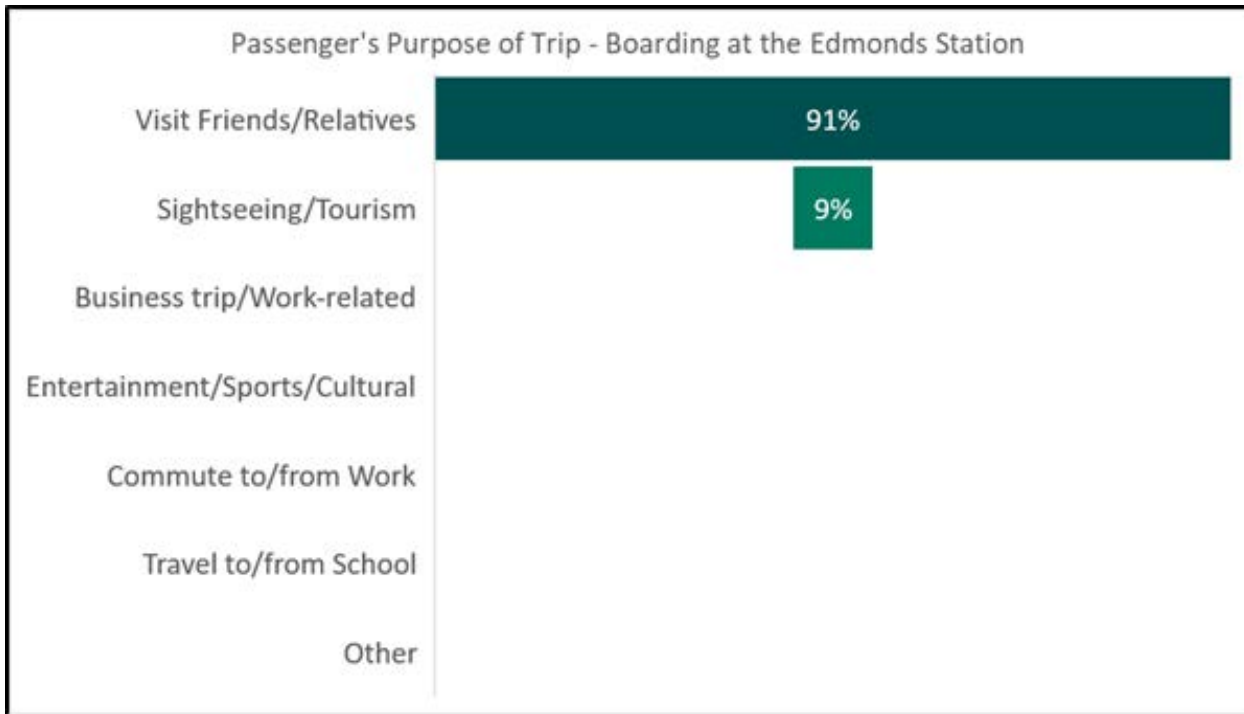


Station overview

The Edmonds Station, owned by BNSF Railway, features a passenger waiting room and shares a platform with Sounder commuter rail that provides other passenger amenities including bicycle lockers, wayfinding signs, and parking. The station is situated on Puget Sound, has easy connections to ferries and local buses, and is in walking distance to a small commercial area with restaurants and a museum.

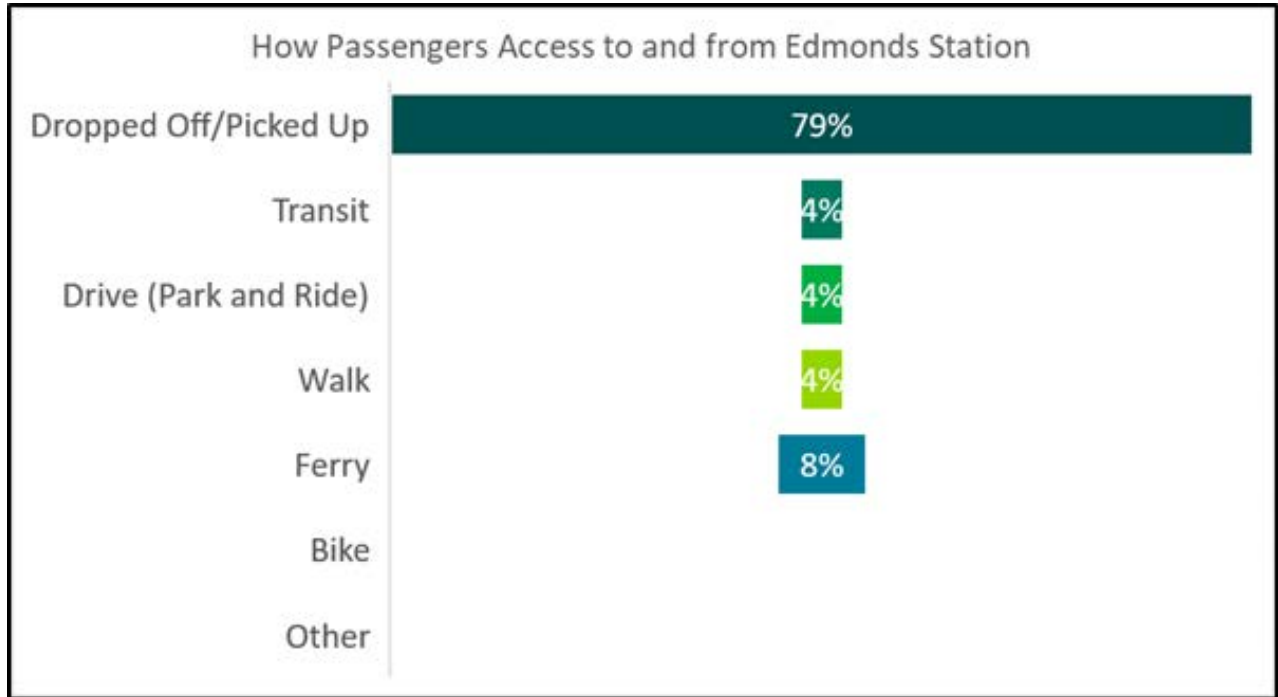
The station served approximately 23,000 passengers in 2017. Trip purpose and mode of access data gathered from a 2018 on-board passenger survey is summarized in Figures 1 and 2. (The on-board survey reached over 1,000 Amtrak Cascades passengers, producing statistically significant results for the corridor. However, at the station level, results may not be statistically significant, particularly at stations with lower ridership.)

Figure-1: Survey Results-Trip Purpose



Note: Survey respondents had the option of selecting more than one response.

Figure-2: Survey Results-Mode of Access



Note: Survey respondents had the option of selecting more than one response.

Parking and drop-off/pick-up

A total of 259 spaces, including dedicated accessible parking, are provided in a surface parking lot at Edmonds Station.

There are painted yellow curb areas at the station with no signing, except one area indicates that there is no parking as it is a fire lane. These areas that are not designated but used for drop-off/pick-up (use for taxi, transportation network companies, or human services transportation).

Walk and transit access

From a pedestrian standpoint, the Edmonds Station is connected with roadways and sidewalks, with three different marked options that people can use to access the station. From the ferry terminal, there is a direct connection from the ferry to the north side of the station. Someone that is walking will have to cross the railroad tracks, but it's clearly marked and from a visual inspection appears ADA-compliant.

Pedestrians can also access the station from Sunset Avenue or Dayton Street. Both streets have sidewalks. A person that is going to/from the mixed-use development that is adjacent to the station, will have to navigate through the parking lot; the pedestrian paths in that parking lot are not clearly marked.

The wayfinding signs have been upgraded and provide clear direction for all users and services.

Commuter rail service is available at the shared passenger rail platform. BNSF plans to add a second track through this location, presenting an opportunity for a second platform. Connections to local/regional bus service occupy the north portion of the station, which offers a simplified multi-seat trip. The bus terminal area has multiple benches and shelters that currently support three bus bays.

Bicycle access

A person looking to bike to/from the station does have options by way of marked bike routes, but there are no marked bicycle lanes or sharrows that connect to the station. There are bike lockers offered at the station, and bicycle-focused wayfinding is provided in the station area.

Connectivity analysis

As shown in Table 1, analysis of land use, mobility and transportation network measures for the Edmonds station yielded a connectivity score of 6.3, of a possible 10 points, indicating significant gaps in the existing connectivity of the station.

The station achieved high sub-scores in the three categories: the number of attractors, the land use context of the station, connecting sidewalks, and wayfinding signs. The analysis also highlights connectivity deficiencies at the Edmonds station that include: a high number of at grade railroad crossings, a low number of connecting transit routes, a low number of private transportation service options, and the lack of a designated area for drop-off/pick-up.

Table 1. Connectivity Evaluation:		Edmonds			
Categories & Measures	Measures	Maximum Points	Maximum Score	Points	Score
LAND USE	2	6	2	4	1.3
Station Location Context & Attractors		3		3	
Zero Car Household		3		1	
MOBILITY	3	9	3	4	1.3
Transit Service		3		1	
Private Transportation Connection Options		3		1	
Human Services Transportation		3		2	
CONNECTED TRANSPORTATION NETWORK	5	15	5	9	3.0
At-Grade Railroad Crossings		3		0	
Sidewalks		3		3	
Bicycle Facilities		3		2	
Drop-off/Pick-up Areas		3		1	
Wayfinding		3		3	
Station Connectivity-Total	10	30	10	17	5.7

Candidate improvements

Based on the results of the connectivity analysis and field visits, Figure 3 and Table 2 identify candidate pedestrian, bicycle, multimodal and railroad crossing improvements that can be expected to enhance connectivity to Edmonds Station and promote increased safety for all travel modes.

Figure-3: Candidate Improvements



Edmonds Station Candidate Improvements

Table 2. Opportunities to Enhance Connectivity at Edmonds Station

Type	Gaps	Candidate Improvement*	Potential Project Examples/ Locations*
Railroad Crossing	Consistent signing, striping, crossing gates, and crossing surface.	Railroad crossing improvements	Main Street, Dayton
Multimodal	Designated drop-off/pick-up area	Signage, striping, and additional designated drop-off/pick-up area for accessible/disabled transportation, either on-site or on-street at station areas	Improve signage and markings at station frontage
Multimodal	Wayfinding signs	Install additional wayfinding signs in station area	Locations to be determined
Pedestrian	Complete sidewalks (curb, gutter, ramps)	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	Sidewalk ramp upgrades to current accessibility guidelines

*WSDOT will work with stakeholders to improve access and connectivity to Amtrak Cascades stations. Local jurisdictions, transit agencies, Amtrak and railroads could consider addressing these opportunities when implementing their capital improvement and service development plans; some of the opportunities identified may also be addressed in these existing plans.

Supporting information – connectivity analysis

The summary results and connectivity score for the Edmonds are supported by geospatial representations of four measured criteria (attractors, zero car households, sidewalks, and bicycle facilities) presented in the figures below and in Table C-1. Multimodal Connectivity Analysis: Observed Data & Assignment of Points.

Figure-4: Station Context-Attractors

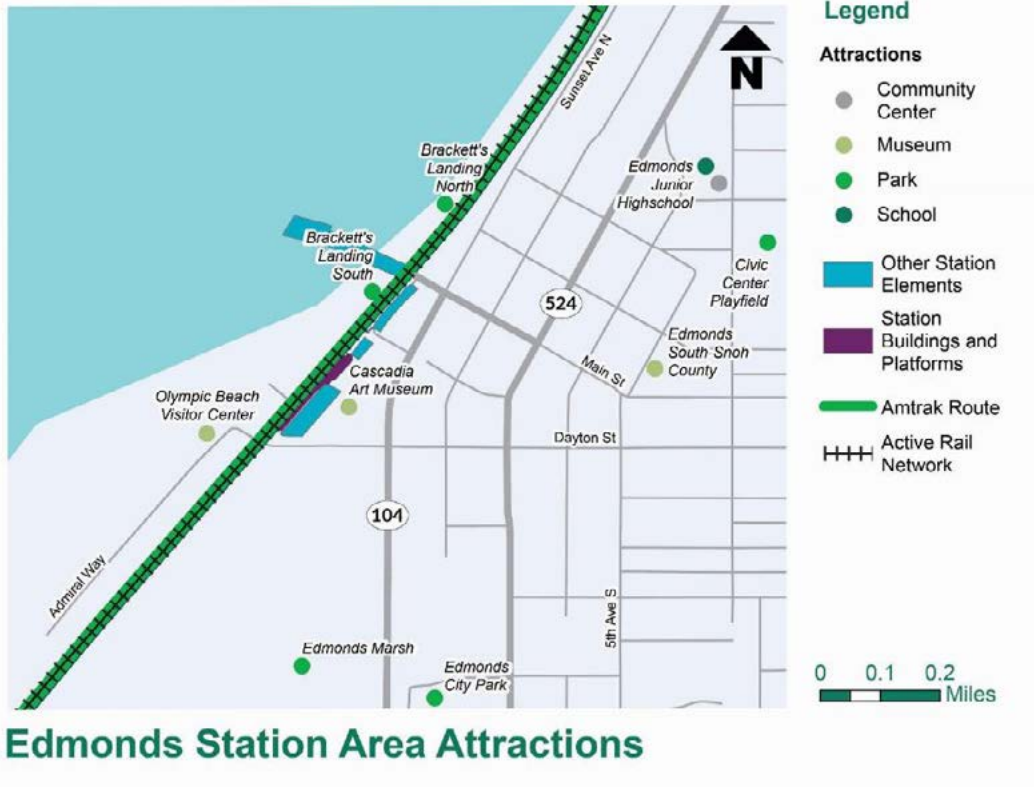


Figure-5: Zero-Car Households

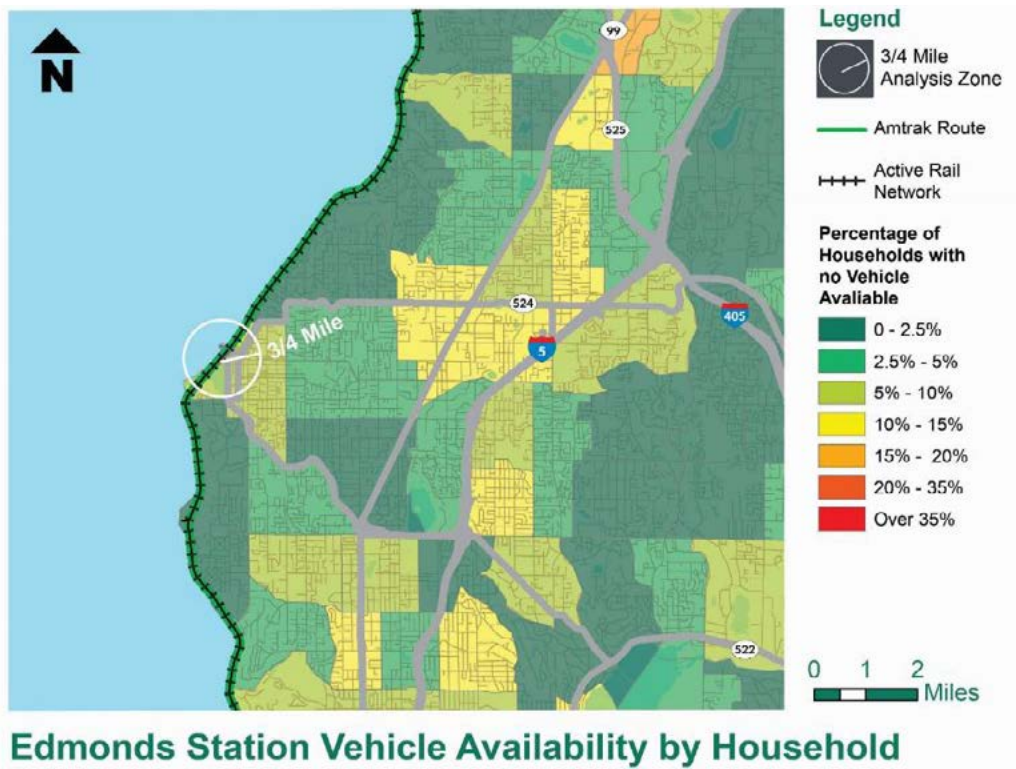


Figure-6: Sidewalks

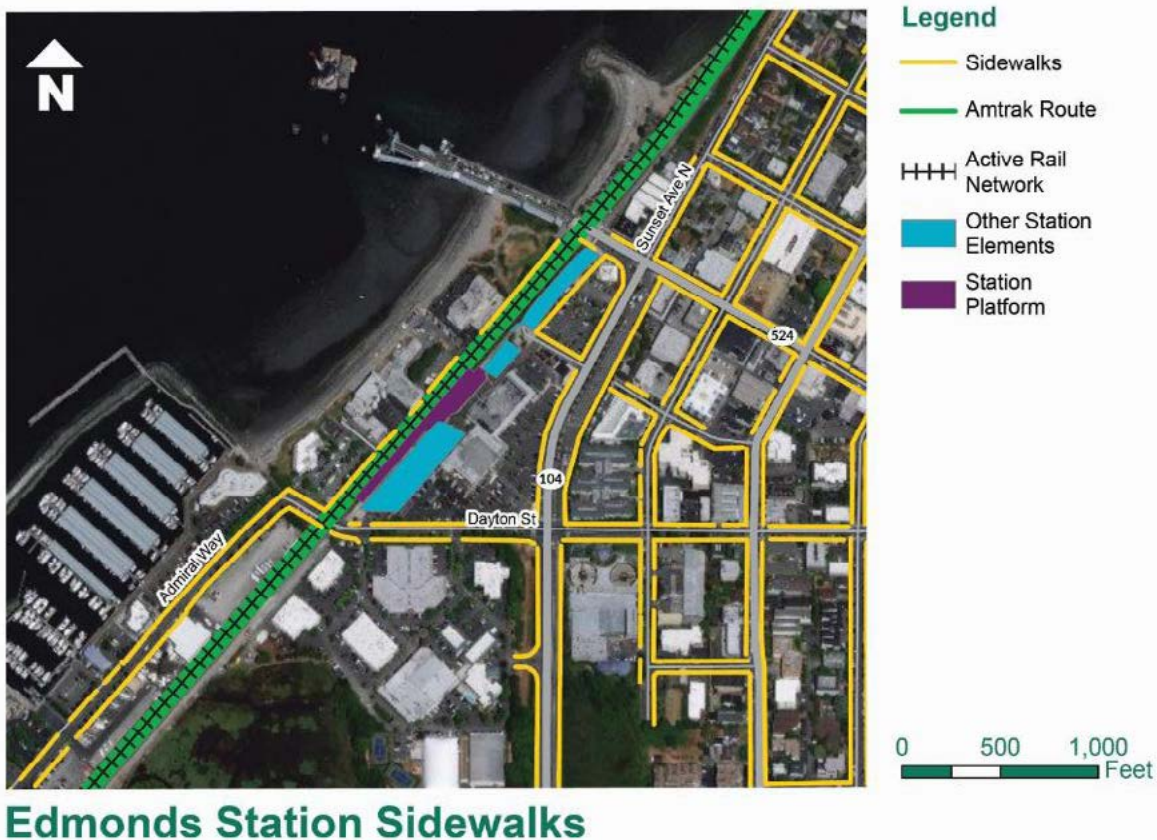
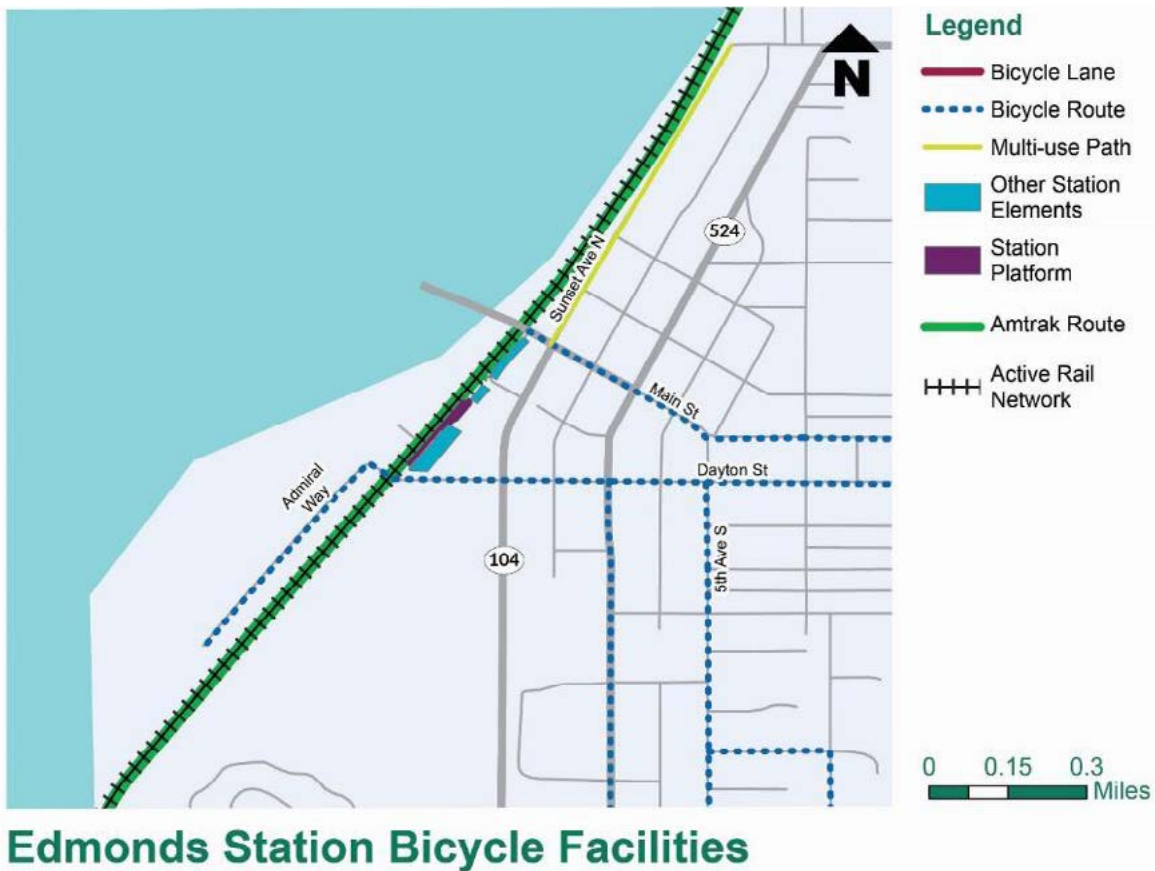


Figure-7: Bicycle Facilities



Supporting information - photo documentation

Site visits were conducted in Edmonds on October 10, 2018 to inventory assets at the station and assess multimodal connections.



Sidewalk and bicycle route wayfinding sign.



Railroad crossing.



Edmonds Station pick-up and drop-off area.



Interior of Amtrak Station.



Entrance to the Ferry Terminal.



Passengers about to board train.

Everett, WA

Everett Station

3201 Smith Ave

Everett, WA 98201



Station overview

Everett Station, owned by the City of Everett, serves Amtrak, Sounder commuter rail, local transit, and intercity bus customers. The station also serves as a community amenity that supports public meetings, job training, a youth center and veteran’s services. The station is located in a commercial/industrial area within walking distance to the downtown area.

The station served approximately 23,000 passengers in 2017. Trip purpose and mode of access data gathered from a 2018 on-board passenger survey is summarized in Figures 1 and 2. (The on-board survey reached over 1,000 Amtrak Cascades passengers, producing statistically significant results for the corridor. However, at the station level, results may not be statistically significant, particularly at stations with lower ridership.)

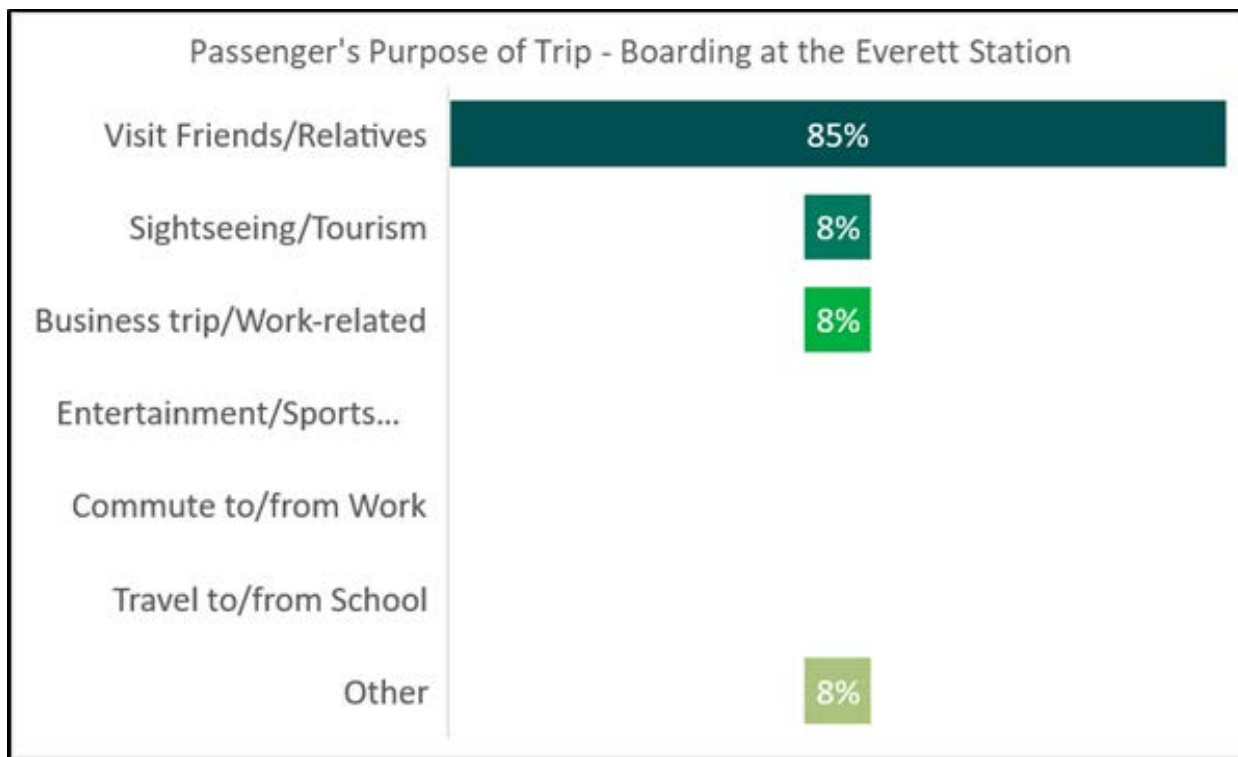
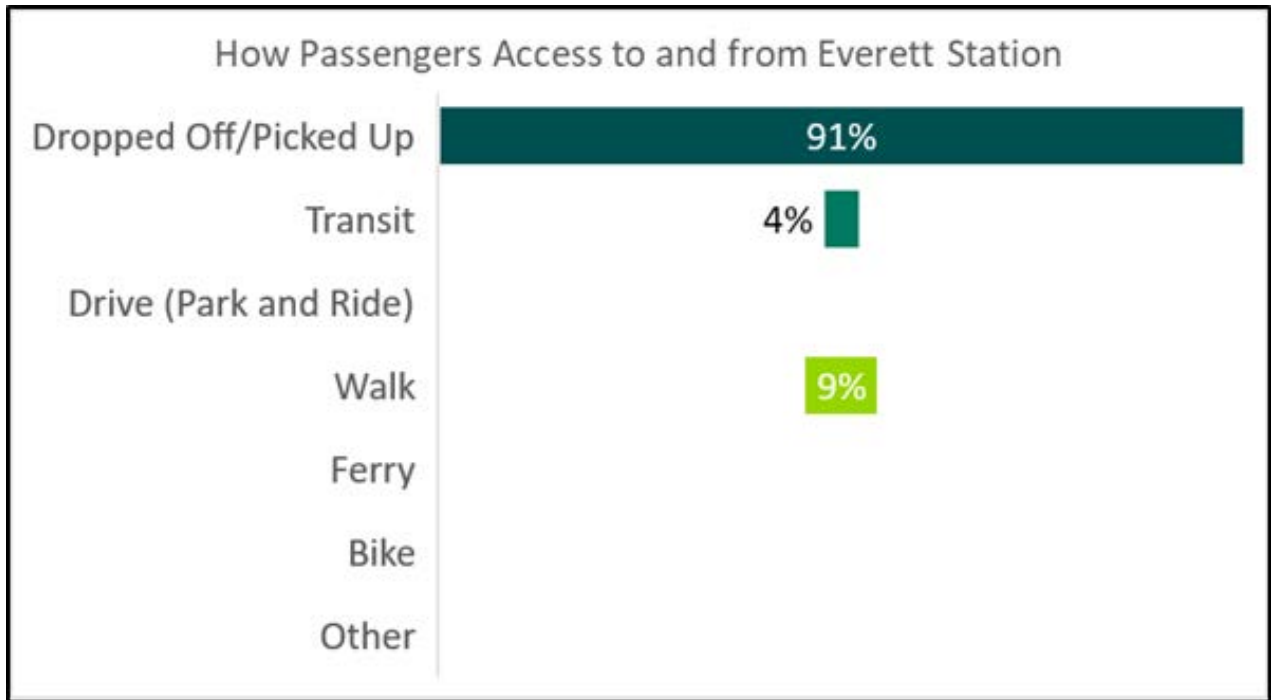


Figure-1: Survey Results-Trip Purpose

Note: Survey respondents had the option of selecting more than one response.

Figure-2: Survey Results-Mode of Access



Note: Survey respondents had the option of selecting more than one response.

Parking and drop-off/pick-up

Several parking lots are provided at Everett Station; most of the parking is designated for use by Sounder patrons, but 25 long-term parking spaces are available for use by Amtrak patrons.

There are painted yellow curb areas with signs at the entrance to the station, from the west side, for drop-off and pick-up (taxi, transportation network companies). Additionally, there is a dedicated, designated drop-off pick-up area for human services transportation providers.

Walk and transit access

From a pedestrian standpoint, the Everett station is connected with roadways and sidewalks that provide safe options to access the station. The only place where a person might have to cross railroad tracks at-grade is at the station platforms. Smith Avenue, the main north/south street adjacent to the station, does have sidewalks on both sides for the majority of the length of the station and connecting transit center. There is a portion of the west side of Smith Avenue that has industrial businesses without sidewalks, but sidewalks are on the station side of the street. The streets that feed east/west to the station are Pacific Avenue, 32nd Avenue, and 33rd Avenue. All have sidewalks.

The wayfinding signs have been upgraded and integrated with the local/regional transit providers to provide clear direction for all different users on how to connect to different services at the station/transit center.

Sound Transit’s Sounder commuter rail service provides train service between Everett Station and Seattle during peak periods. The transit center at the Everett station has 25 bus bays operated by five different local/regional bus service providers. The bus terminal area has multiple benches and shelters and a grade-separated pedestrian bridge connecting the park and ride lot east of the tracks to the train and bus platforms.

Bicycle access

If a passenger was planning to ride their bicycle to the Everett Station, there would not be many route options that have bicycle facilities. There is one option to connect on the south side of the transit center and Amtrak station by way of Smith Avenue that has a narrow marking for the majority of the route from 41st street, with a portion of the southbound side of the road that has a bicycle lane. At 41st Avenue, there is a direct connection to the Interurban Trail. Bicycle racks and lockers are available at this station.

Connectivity Analysis

As shown in Table 1, analysis of land use, mobility and transportation network measures for the Everett station yielded a connectivity score of 8.0, of a possible 10 points, indicating generally good connectivity with some gaps in the existing connectivity of the station.

Strengths related to the connectivity of the Everett Station include the high percentage of zero-car households in the area; the human service transportation plan provided for this area; the number of connecting transit options and sidewalks available, and the well-defined area for dropping-off/picking-up passengers. The analysis also identifies access issues at the station that include a low number of connecting bicycle facilities and the presence of unimproved at-grade railroad crossings.

Table 1. Connectivity Evaluation:		Everett			
Categories & Measures	Measures	Maximum Points	Maximum Score	Points	Score
LAND USE	2	6	2	5	1.7
Station Location Context & Attractors		3		2	
Zero Car Household		3		3	
MOBILITY	3	9	3	7	2.3
Transit Service		3		3	
Private Transportation Connection Options		3		1	
Human Services Transportation		3		3	
CONNECTED TRANSPORTATION NETWORK	5	15	5	12	4.0
At-Grade Railroad Crossings		3		2	
Sidewalks		3		3	
Bicycle Facilities		3		1	
Drop-off/Pick-up Areas		3		3	
Wayfinding		3		3	
Station Connectivity-Total	10	30	10	24	8.0

Candidate improvements

Based on the results of the connectivity analysis and field visits, Figure 3 and Table 2 identify candidate pedestrian, bicycle, multimodal and railroad crossing improvements that can be expected to enhance connectivity to Everett Station and promote increased safety for all travel modes. These candidate improvements, including potential project examples and/or locations, were identified based on the system-wide candidate improvement types, analysis of existing connectivity gaps, and site visits. These representative examples may include facilities owned by the State, Amtrak, railroads or local agencies. WSDOT will further evaluate the viability of the opportunities identified here to improve state facilities for better access to Amtrak Cascades stations. Amtrak, railroads and local agencies can consider implementing improvements to their facilities and operations, similar to these representative examples, as they develop their capital improvement and service plans.

Figure-3: Candidate Improvements



Everett Station Candidate Improvements

Table 2. Opportunities to Enhance Connectivity at Everett Station

Type	Gaps	Candidate Improvement*	Potential Project Examples/ Locations*
Bicycle	Dedicated bicycle lanes	Bicycle facility improvements within 1/2-mile radius of station	Smith Avenue from Pacific Avenue to 41st Street and the Interurban Trail; 33rd Avenue
Multimodal	Wayfinding signs	Install additional wayfinding signs in station area	Locations to be determined
Pedestrian	Complete sidewalks (curb, gutter, ramps)	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	Sidewalk ramp upgrades to current accessibility guidelines

*WSDOT will work with stakeholders to improve access and connectivity to Amtrak Cascades stations. Local jurisdictions, transit agencies, Amtrak and railroads could consider addressing these opportunities when implementing their capital improvement and service development plans; some of the opportunities identified may also be addressed in these existing plans.

Supporting information - connectivity analysis

The summary results and connectivity score for the Everett station are supported by geospatial representations of four measured criteria (attractors, zero car households, sidewalks, and bicycle facilities) presented in the figures below and in Table C-1. Multimodal Connectivity Analysis: Observed Data & Assignment of Points.

Figure-4: Station Context-Attractors



Figure-5: Zero-Car Households

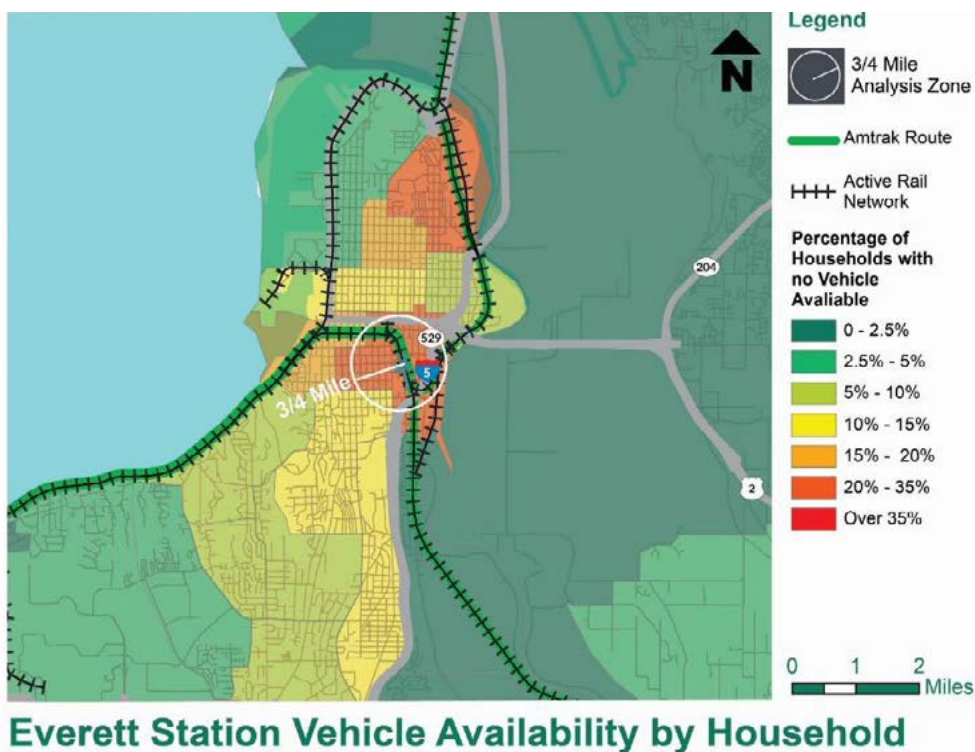
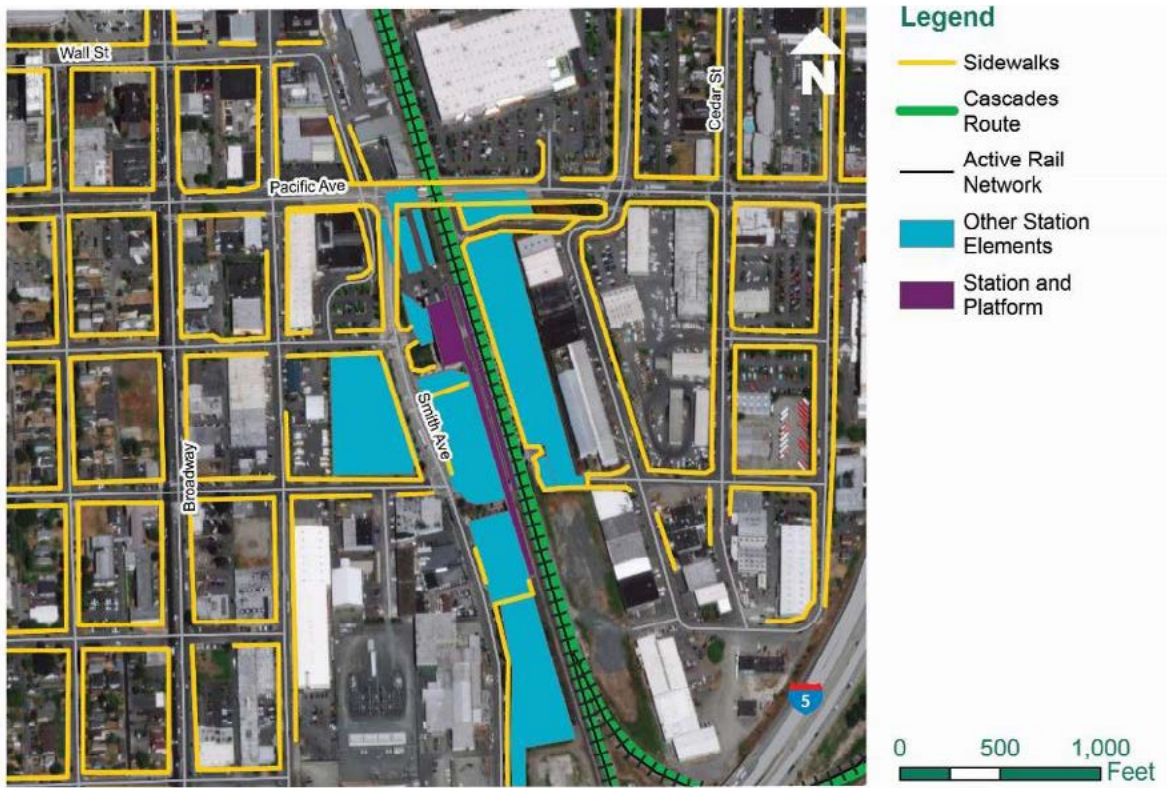
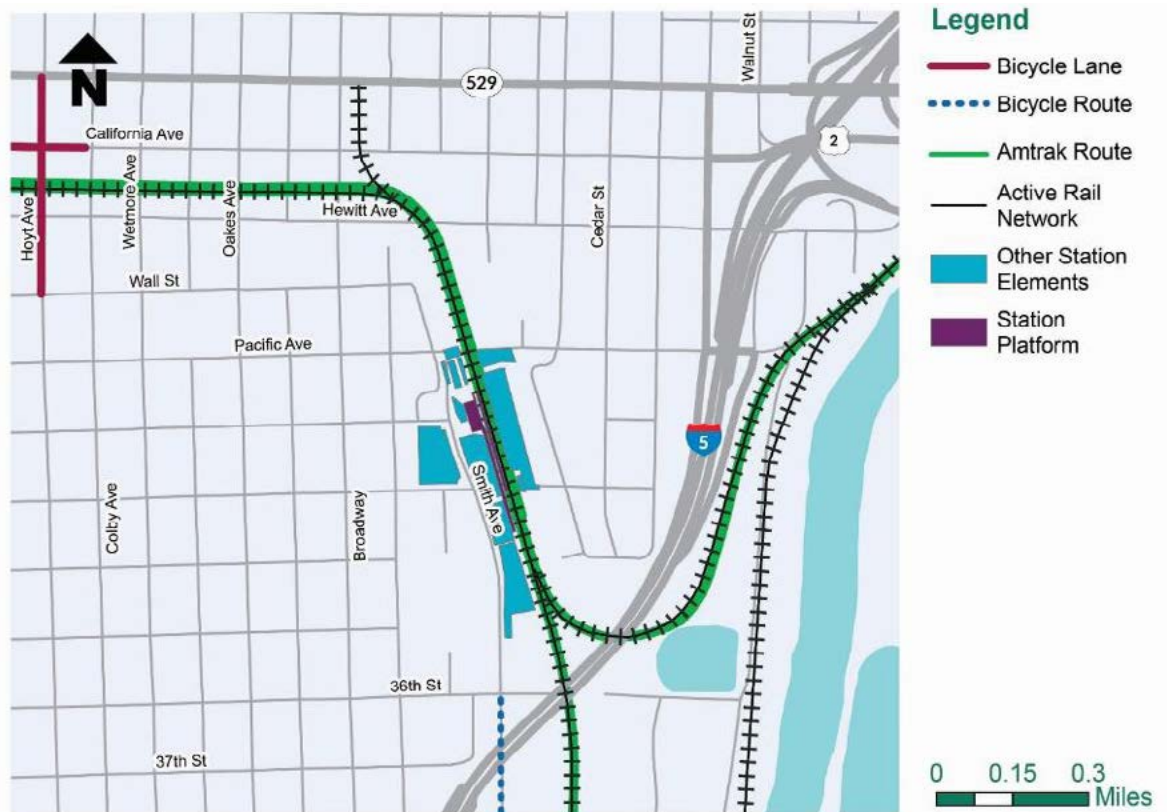


Figure-6: Sidewalks



Everett Station Sidewalks

Figure-7: Bicycle Facilities



Everett Station Bicycle Facilities

Supporting information - photo documentation

Site visits were conducted in Everett on October 10, 2018 to inventory assets at the station and assess multimodal connections.



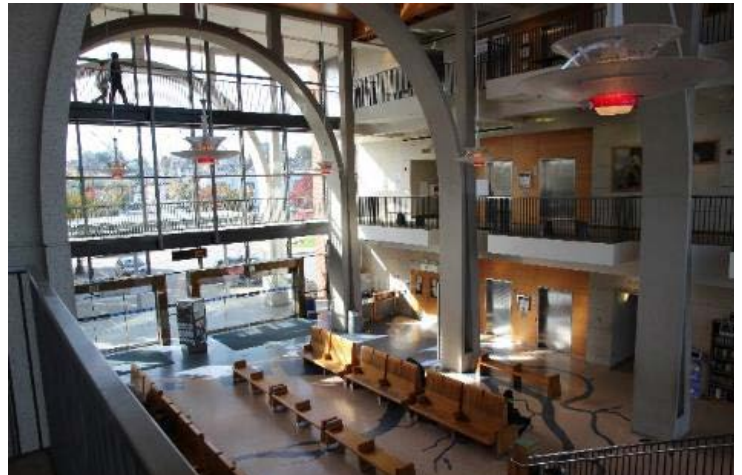
Local transit connection at Everett Station.



Sidewalks with curb striping.



Bus station and shelter.



Interior of Everett Station



Informational signs.



Information Center inside Amtrak Station.

Stanwood, WA

Stanwood Station
 27111 Florence Way
 Stanwood, WA 98292

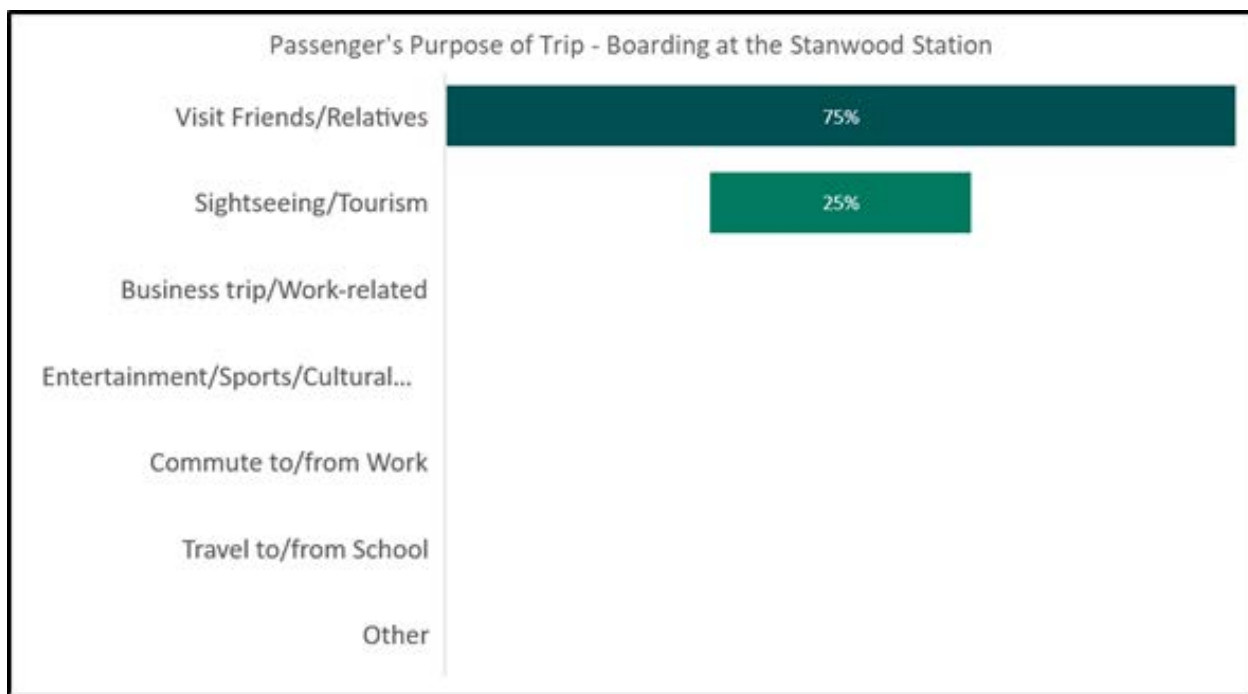


Station overview

Stanwood Station offers a platform and canopy; there is no station building, waiting area or ticket office at this location. The station, owned by WSDOT, is near the main commercial street in Stanwood and close to a residential area to the east of the railroad tracks.

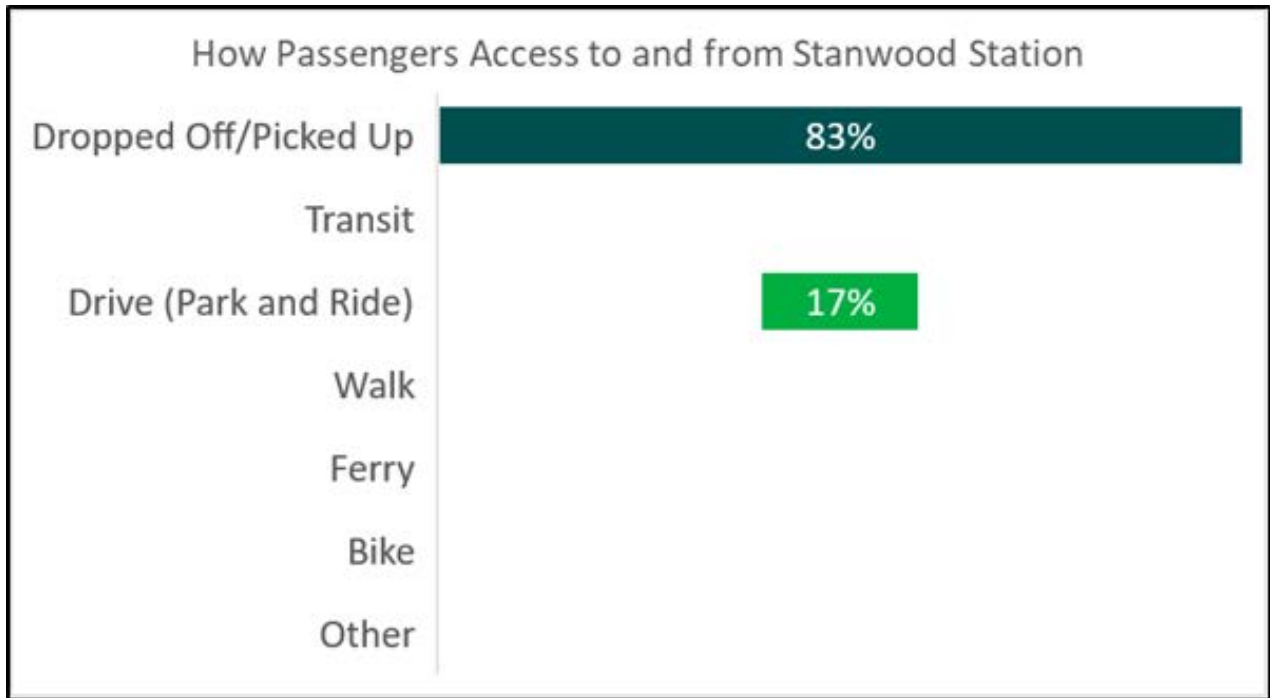
The station served approximately 5,000 passengers in 2017. Trip purpose and mode of access data gathered from a 2018 on-board passenger survey is summarized in Figures 1 and 2. (The on-board survey reached over 1,000 Amtrak Cascades passengers, producing statistically significant results for the corridor. However, at the station level, results may not be statistically significant, particularly at stations with lower ridership.)

Figure-1: Survey Results-Trip Purpose



Note: Survey respondents had the option of selecting more than one response.

Figure-2: Survey Results-Mode of Access



Note: Survey respondents had the option of selecting more than one response.

Parking and drop-off/pick-up

The station has 10 parking spaces in a surface parking lot; the parking is also used by businesses located adjacent to the station. A designated drop-off/pick-up area is provided.

Walk and transit access

On 271st Street NW, the southern boundary of the station, there are sidewalks on both sides between SR 532 and 84th Avenue NW (adjacent to the railroad tracks). Markings clearly indicate that sidewalks end on the south side of the street and a signed crosswalk marks where people are supposed to cross to access sidewalks on the north side east of 84th Avenue NW. The presence of pedestrian safety flags at this crossing indicate safety concerns. When 271st Street NW crosses the railroad tracks at 84th Avenue NW, there is also one marked at-grade sidewalk crossing on the north side of the road. The other streets that provide access to the station, 88th Avenue NW Street and 272nd Street NW have a rural cross section with no sidewalks.

A bus stop for service provided by Island Transit is located within one-quarter mile from the station platform, near the intersection of 88th Avenue NW with SR 532.

Bicycle access

There are no marked bicycle facilities connecting to the station. The City considers SR 532, 271st Street NW, 92nd Ave NW, 276th St NW and Pioneer Highway to be bicycle routes. People that choose to access the Stanwood station must follow the bicycle laws for Washington state and ride with traffic.

Connectivity analysis

As shown in Table 1, analysis of land use, mobility and transportation network measures for the Stanwood station yielded a connectivity score of 6.0, of a possible 10 points, indicating significant gaps in the existing connectivity of the station.

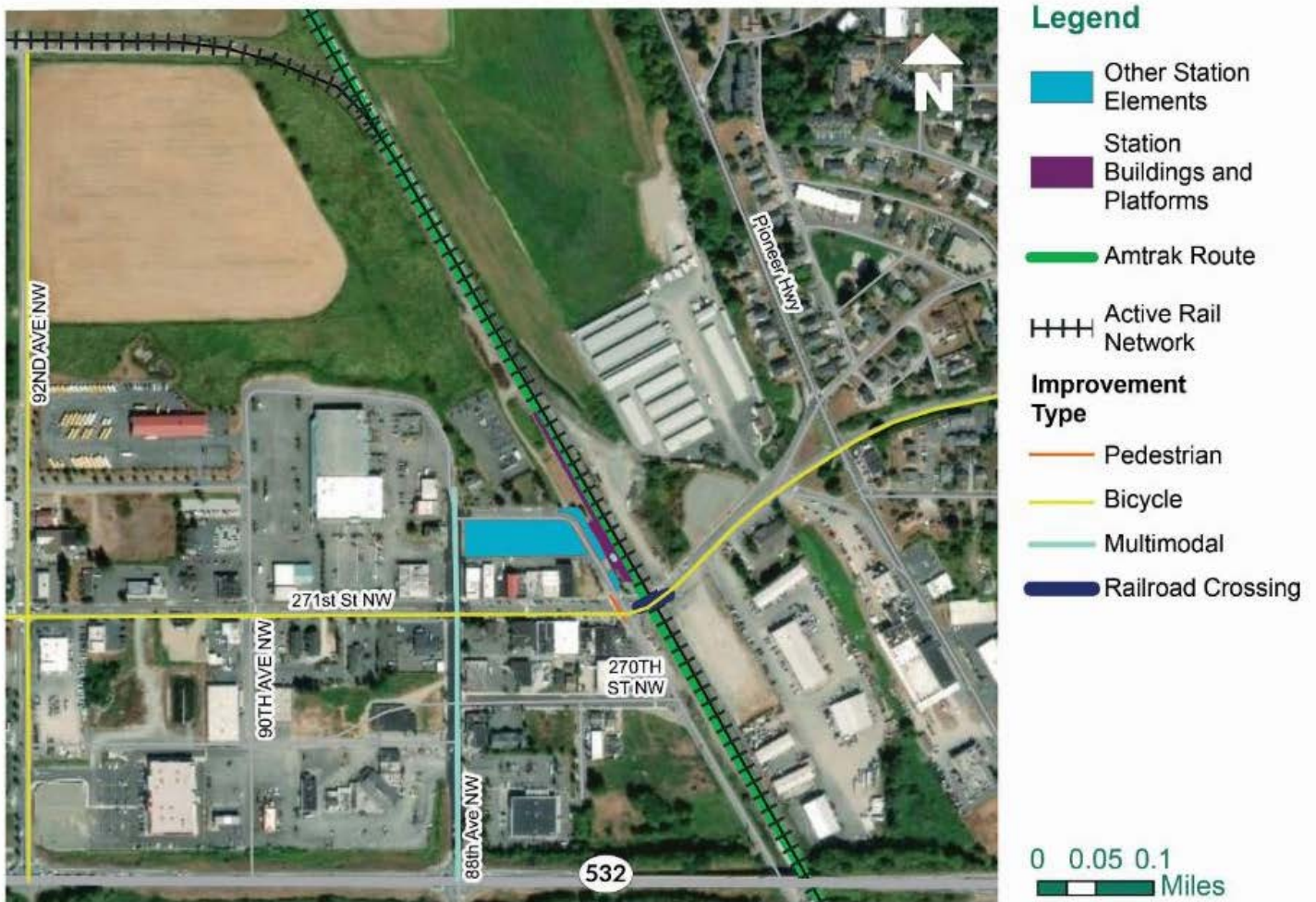
The station achieved higher sub-scores in the two categories: the area to drop-off/pick-up passengers and the related Human Services Transportation Plan. The analysis also highlights access issues surrounding the Stanwood station that include: a low number of attractors, low amount of zero car households, a low number of transportation connectivity options, a lower number of connecting bicycle facilities, and wayfinding signs.

Table 1. Connectivity Evaluation:		Stanwood			
Categories & Measures	Measures	Maximum Points	Maximum Score	Points	Score
LAND USE	2	6	2	3	1.0
Station Location Context & Attractors		3		2	
Zero Car Household		3		1	
MOBILITY	3	9	3	6	2.0
Transit Service		3		2	
Private Transportation Connection Options		3		1	
Human Services Transportation		3		3	
CONNECTED TRANSPORTATION NETWORK	5	15	5	9	3.0
At-Grade Railroad Crossings		3		2	
Sidewalks		3		2	
Bicycle Facilities		3		1	
Drop-off/Pick-up Areas		3		3	
Wayfinding		3		1	
Station Connectivity-Total	10	30	10	18	6.0

Candidate improvements

Based on the results of the connectivity analysis and field visits, Figure 3 and Table 2 identify candidate pedestrian, bicycle, multimodal and railroad crossing improvements that can be expected to enhance connectivity to Stanwood Station and promote increased safety for all travel modes.

Figure-3: Candidate Improvements



Stanwood Station Candidate Improvements

Table 2. Opportunities to Enhance Connectivity at Stanwood Station

Type	Gaps	Candidate Improvement*	Potential Project Examples/ Locations*
Railroad Crossing	Signage, striping, crossing gates, and crossing surface	Railroad crossing improvements	271st Street
Transit	Direct local transit service connections.	Additional transit service to station area	New or modified transit routes
Bicycle	Bicycle lanes	Bicycle facility improvements within 1/2-mile radius of station	92nd Avenue
Pedestrian	Complete sidewalks (curb, gutter, ramps)	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	Lien/88th Street sidewalk improvements; curb bulbs/ flashing pedestrian beacon at 271st/84th Avenue
Multimodal	Wayfinding signs	Install additional wayfinding signs in station area	Locations to be determined

*WSDOT will work with stakeholders to improve access and connectivity to Amtrak Cascades stations. Local jurisdictions, transit agencies, Amtrak and railroads could consider addressing these opportunities when implementing their capital improvement and service development plans; some of the opportunities identified may also be addressed in these existing plans.

Supporting information - connectivity analysis

The summary results and connectivity score for the Stanwood station are supported by geospatial representations of four measured criteria (attractors, zero car households, sidewalks, and bicycle facilities) presented in the figures below and in Table C-1. Multimodal Connectivity Analysis: Observed Data & Assignment of Points.

Figure-4: Station Context-Attractors



Figure-5: Zero-Car Households

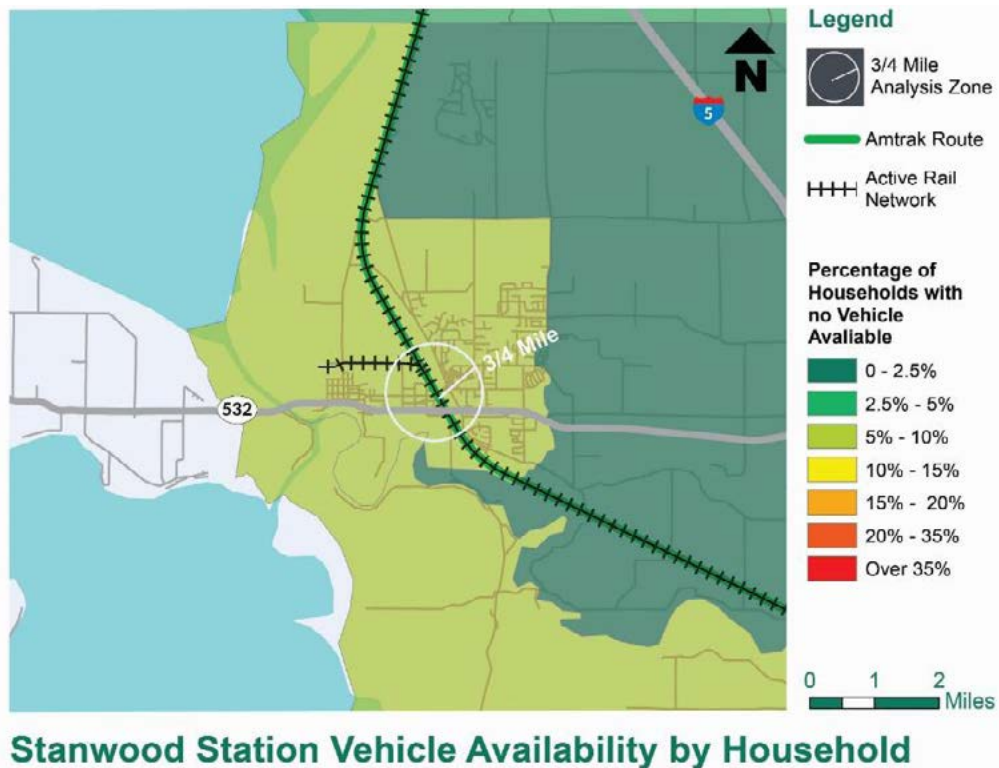


Figure-6: Sidewalks

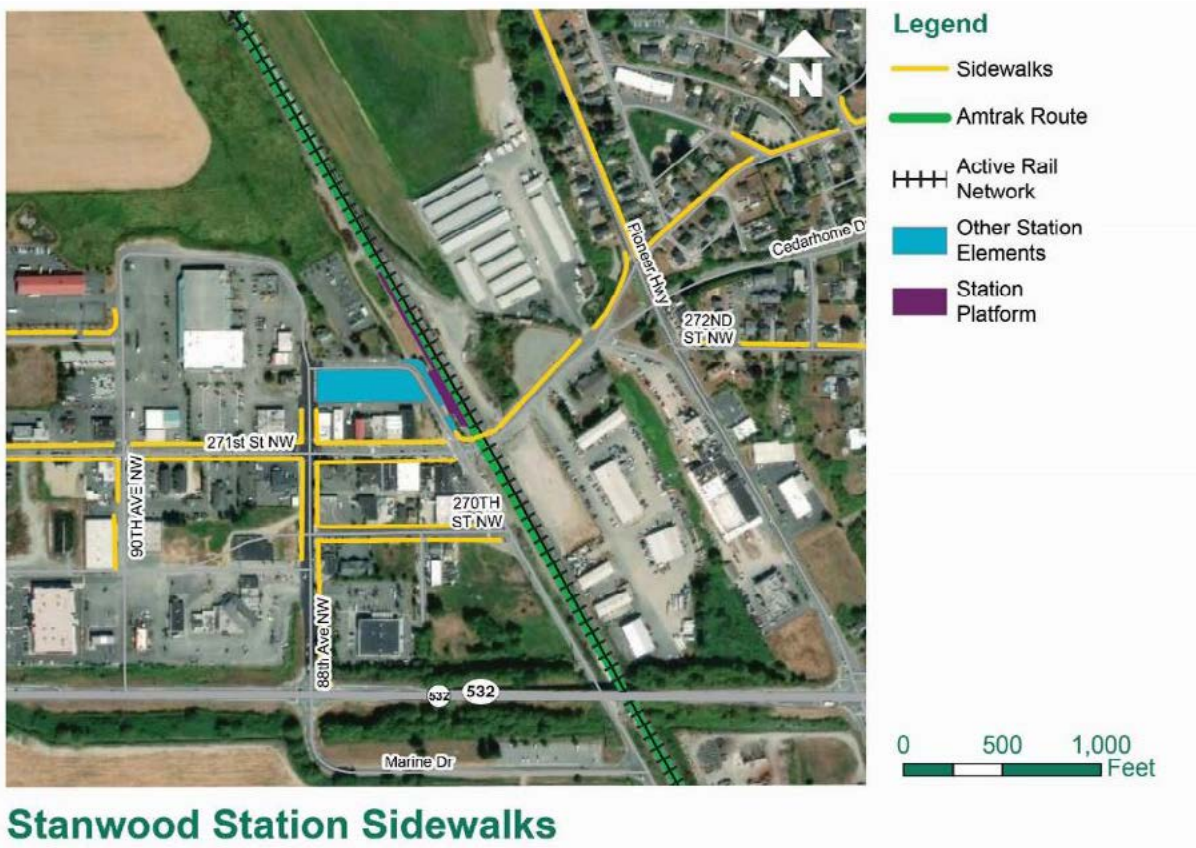
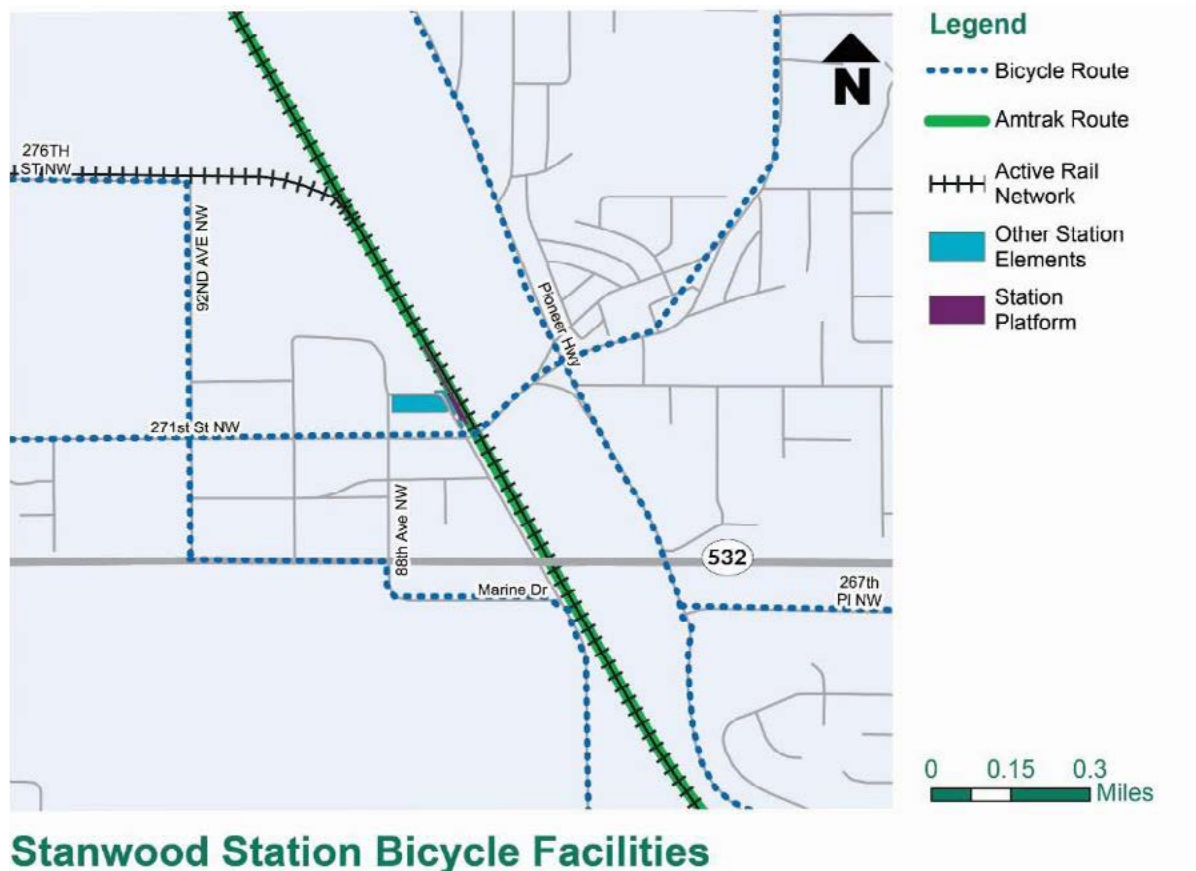


Figure-7: Bicycle Facilities



Supporting information - photo documentation

Site visits were conducted in Stanwood on October 10, 2018 to inventory assets at the station and assess multimodal connections.



Railroad crossing.



ADA drop off location.



Station platform with shelter.



Local bus stop next to Amtrak station. Transit service is no longer provided at this location.

Mount Vernon, WA

Skagit Transportation Center
 105 E Kincaid St
 Mount Vernon, WA 98273

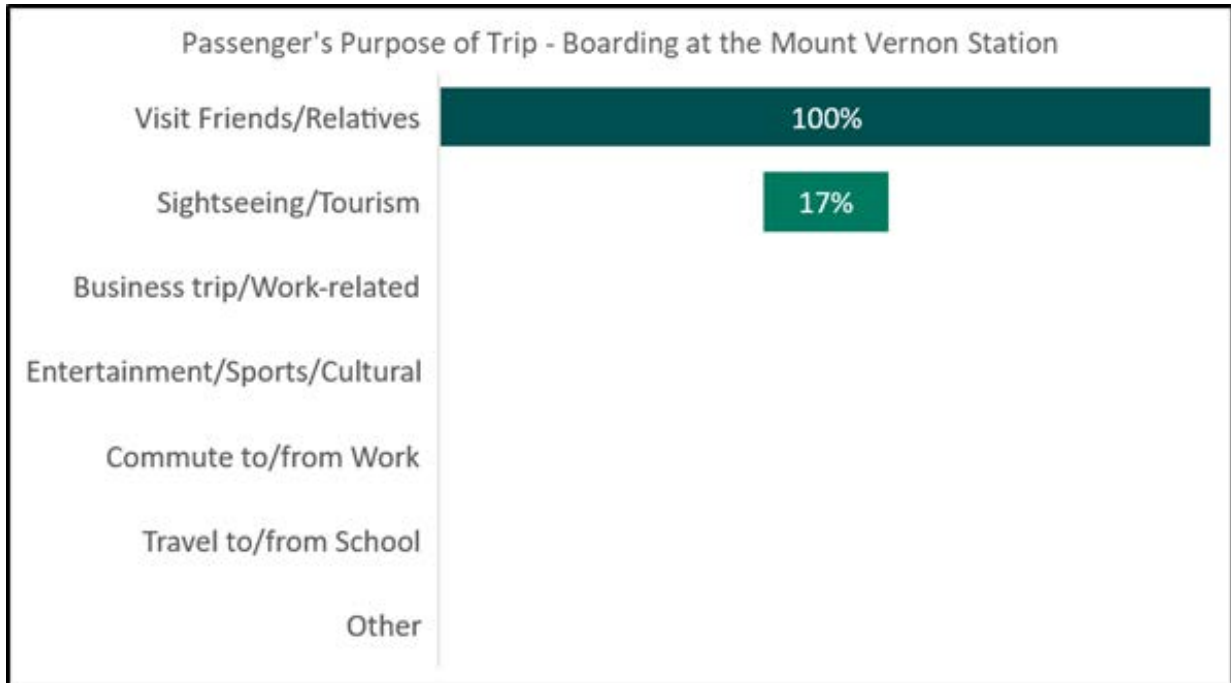


Station overview

Amtrak Cascades service to Mount Vernon, Washington is provided at the Skagit Transportation Center. Owned and operated by Skagit Transit, the Skagit Transportation Center serves twelve bus routes including local service and long-distance carriers. The station is located across the railroad tracks from the downtown commercial area of Mount Vernon and adjacent to an interchange on Interstate 5.

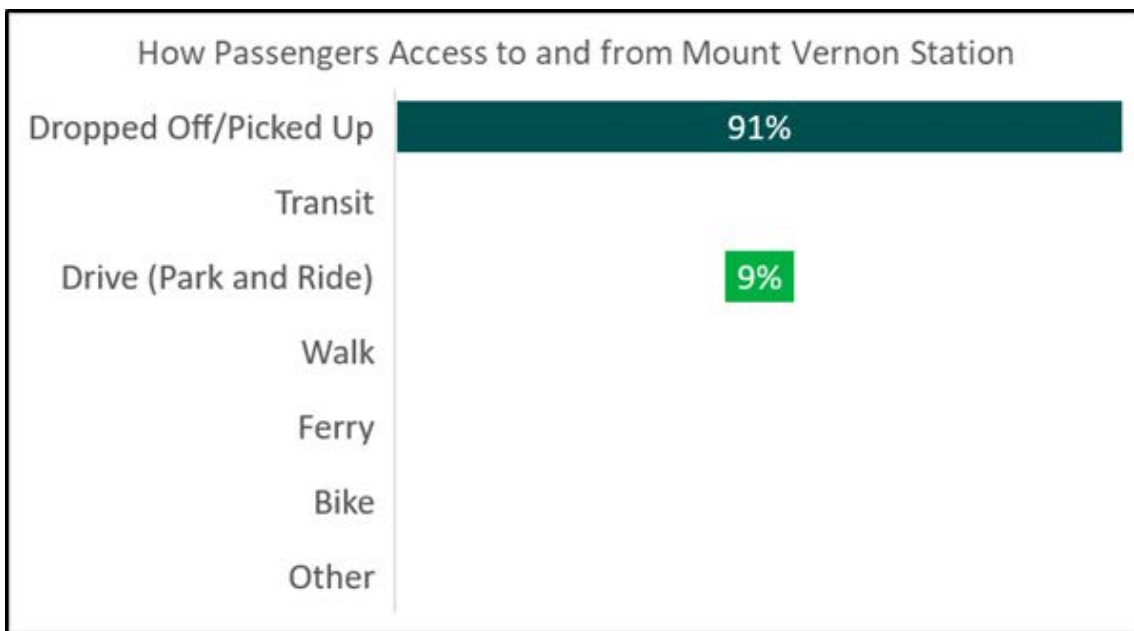
The station served approximately 18,000 passengers in 2017. Trip purpose and mode of access data gathered from a 2018 on-board passenger survey is summarized in Figures 1 and 2. (The on-board survey reached over 1,000 Amtrak Cascades passengers, producing statistically significant results for the corridor. However, at the station level, results may not be statistically significant, particularly at stations with lower ridership.)

Figure-1: Survey Results-Trip Purpose



Note: Survey respondents had the option of selecting more than one response.

Figure-2: Survey Results-Mode of Access



Note: Survey respondents had the option of selecting more than one response.

Parking and drop-off/pick-up

The station has 50 parking spaces, including dedicated accessible parking, provided in a surface parking lot.

There are painted yellow curb areas with signs at the entrance to the station, from the west side, for drop-off and pick-up (taxi, transportation network companies). Additionally, there is a dedicated drop-off pick-up area for human service transportation and people with disabilities that is signed and striped differently than the regular drop-off/pick-up areas.

Walk and transit access

From a pedestrian standpoint, the Mount Vernon station is connected with roadways and sidewalks that users can access the station by two different entry/exit points, Montgomery Street (via South 4th Street) and Kincaid Street. These intersections have clearly marked pedestrian pathways for improved wayfinding and improved safety. On both Montgomery and Kincaid Streets, there are at-grade railroad crossings that are not marked with additional paint or striping for pedestrians.

The Skagit Transportation Center includes eight bus bays and marked pedestrian crosswalk to get to and from the station building. The bus terminal area has multiple benches and shelters. Skagit Transit provides service connecting Amtrak Cascades to regional destinations like Whidbey Island and the San Juan Islands (via Washington State Ferries terminal at Anacortes).

Bicycle access

There are no dedicated bicycle facilities providing connections to the station. However, bicycle racks are provided at the station.

Connectivity analysis

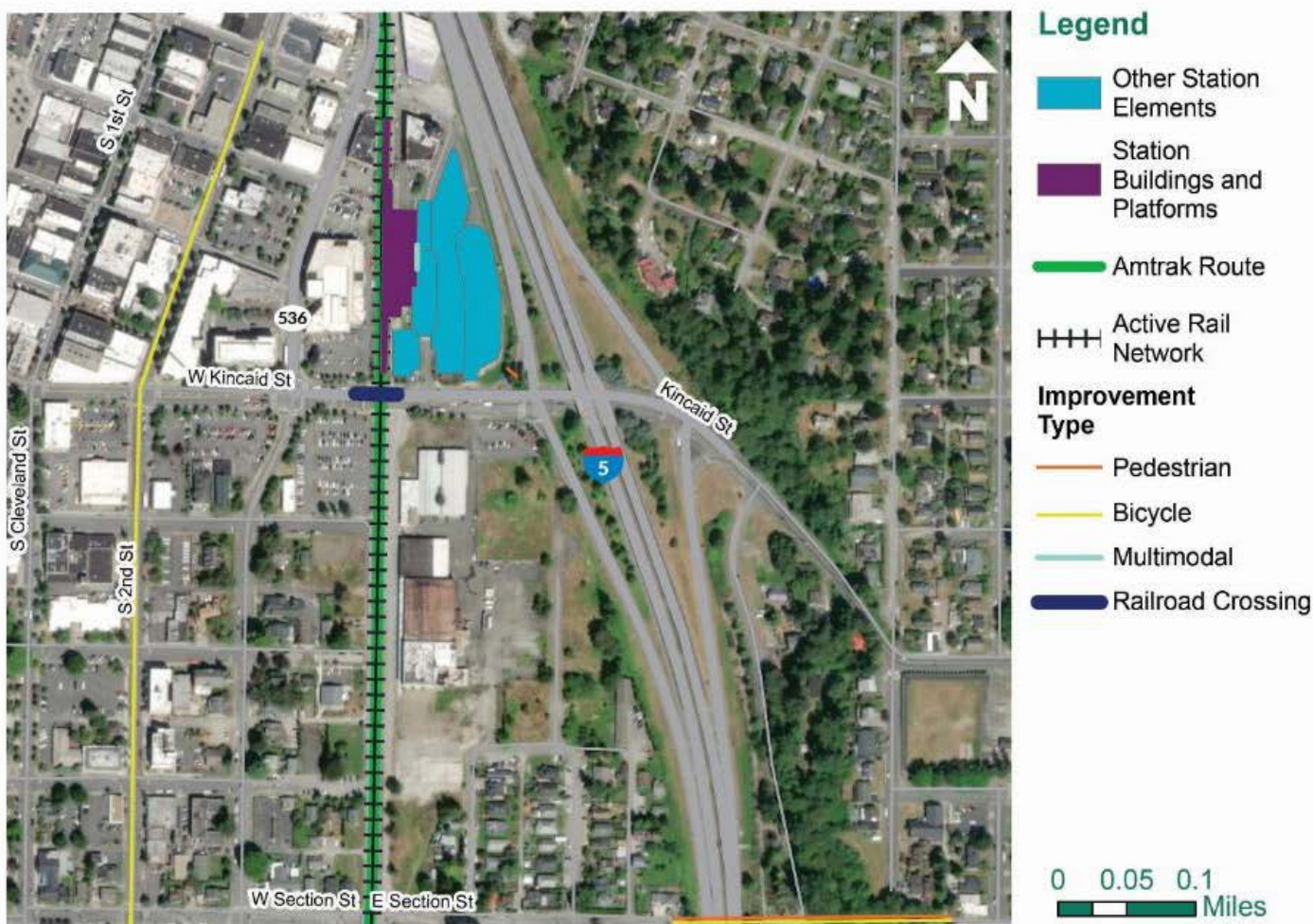
As shown in Table 1, analysis of land use, mobility and transportation network measures for Mount Vernon Station yielded a connectivity score of 6.7, of a possible 10 points, indicating generally good connectivity with some gaps. The station achieved high or medium sub-scores in all categories except for zero-car households, at-grade railroad crossings, and private transportation connection options.

Table 1. Connectivity Evaluation:		Mt. Vernon			
Categories & Measures	Measures	Maximum Points	Maximum Score	Points	Score
LAND USE	2	6	2	4	1.3
Station Location Context & Attractors		3		3	
Zero Car Household		3		1	
MOBILITY	3	9	3	7	2.3
Transit Service		3		3	
Private Transportation Connection Options		3		1	
Human Services Transportation		3		3	
CONNECTED TRANSPORTATION NETWORK	5	15	5	9	3.0
At-Grade Railroad Crossings		3		1	
Sidewalks		3		2	
Bicycle Facilities		3		2	
Drop-off/Pick-up Areas		3		2	
Wayfinding		3		2	
Station Connectivity-Total	10	30	10	21	6.7

Candidate improvements

Based on the results of the connectivity analysis and field visits, Figure 3 and Table 2 identify candidate pedestrian, bicycle, multimodal and railroad crossing improvements that can be expected to enhance connectivity to the station and promote increased safety for all travel modes. These candidate improvements, including potential project examples and/or locations, were identified based on the system-wide candidate improvement types, analysis of existing connectivity gaps, and site visits. These representative examples may include facilities owned by the State, Amtrak, railroads or local agencies. WSDOT will further evaluate the viability of the opportunities identified here to improve state facilities for better access to Amtrak Cascades stations. Amtrak, railroads and local agencies can consider implementing improvements to their facilities and operations, similar to these representative examples, as they develop their capital improvement and service plans.

Figure-3: Candidate Improvements



Mt. Vernon (Skagit) Station Candidate Improvements

Table 2. Opportunities to Enhance Connectivity at Skagit Transportation Center

Type	Gaps	Candidate Improvement*	Potential Project Examples/ Locations*
Railroad Crossing	Consistent signing, striping, crossing gates, and crossing surface	Railroad crossing improvements	Kincaid Street, Montgomery Street
Bicycle	Bicycle lanes	Bicycle facility improvements within 1/2-mile radius of station	Bicycle lanes on 2nd Street; Bicycle route crossing I-5 from the station area southward
Multimodal	Wayfinding signs	Install additional wayfinding signs at station	Add signage to increase branded Amtrak presence
Pedestrian	Crosswalk markings	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	Pedestrian crossing markings at Kincaid Street

*WSDOT will work with stakeholders to improve access and connectivity to Amtrak Cascades stations. Local jurisdictions, transit agencies, Amtrak and railroads could consider addressing these opportunities when implementing their capital improvement and service development plans; some of the opportunities identified may also be addressed in these existing plans.

Supporting information - connectivity analysis

The summary results and connectivity score for the Mount Vernon station are supported by geospatial representations of four measured criteria (attractors, zero car households, sidewalks, and bicycle facilities) presented in the figures below and in Table C-1. Multimodal Connectivity Analysis: Observed Data & Assignment of Points.

Figure-4: Station Context-Attractors

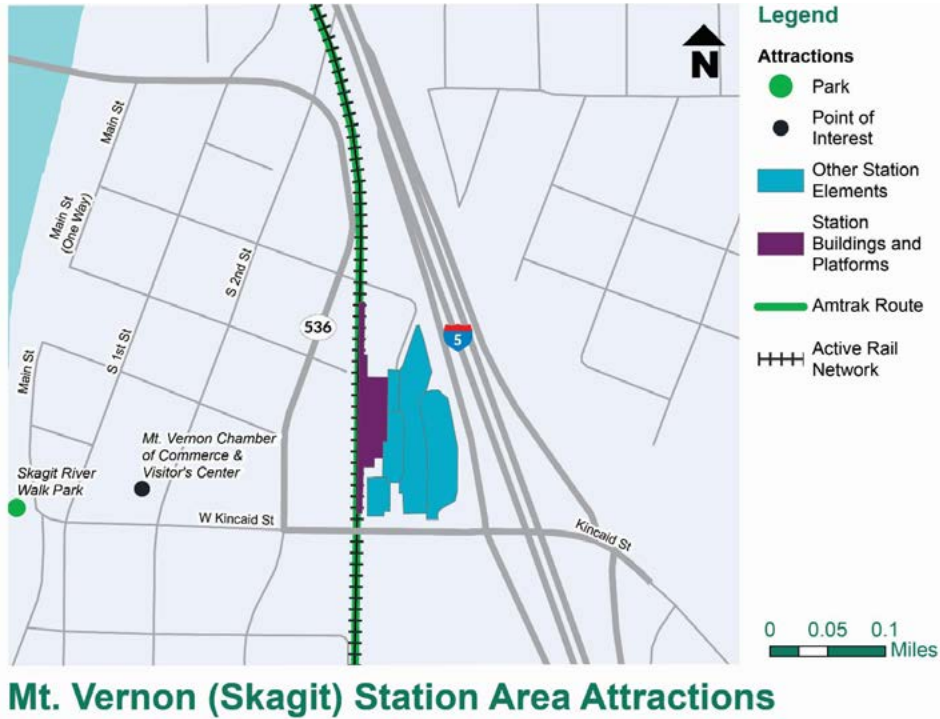


Figure-5: Zero-Car Households

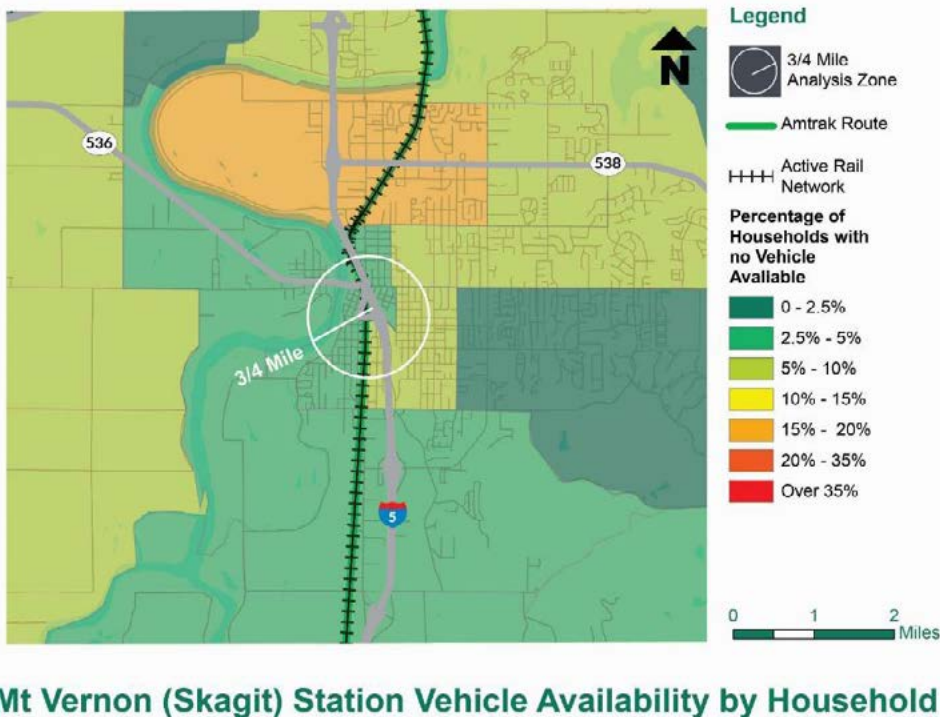


Figure-6: Sidewalks

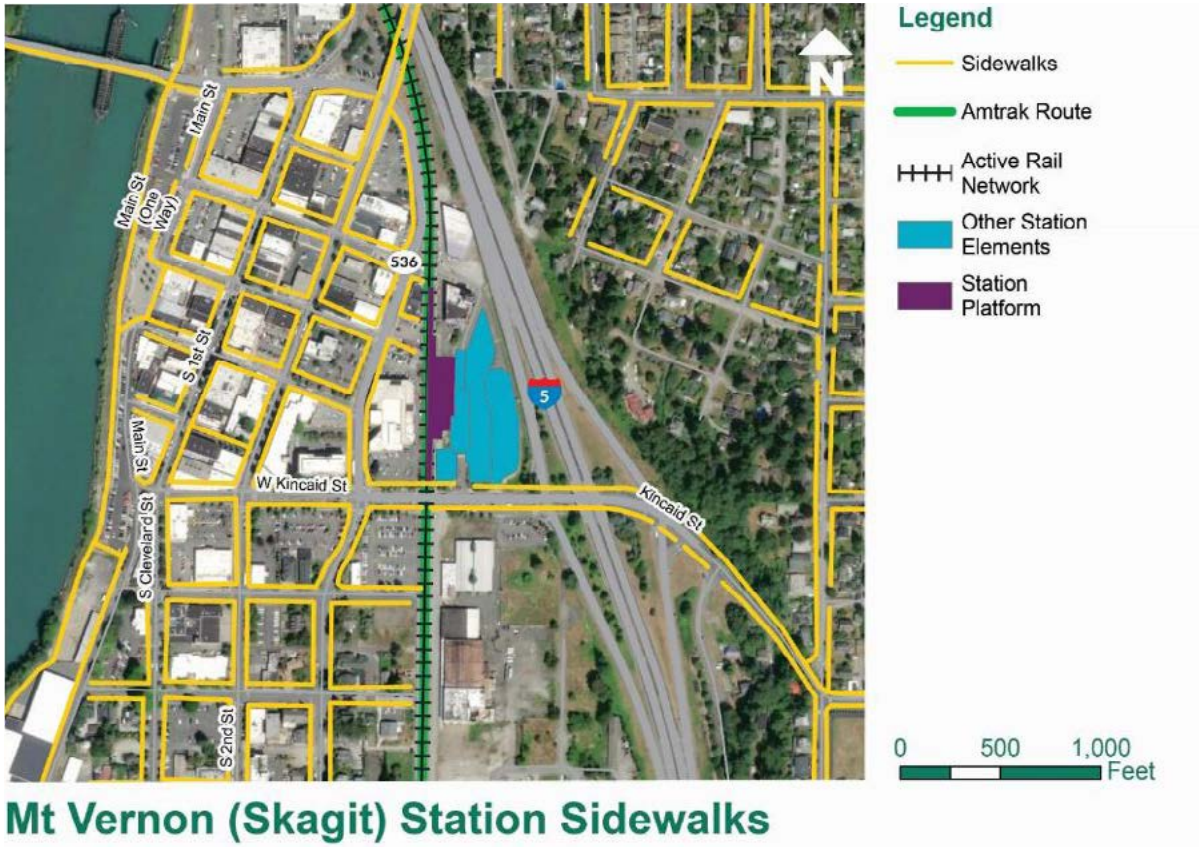
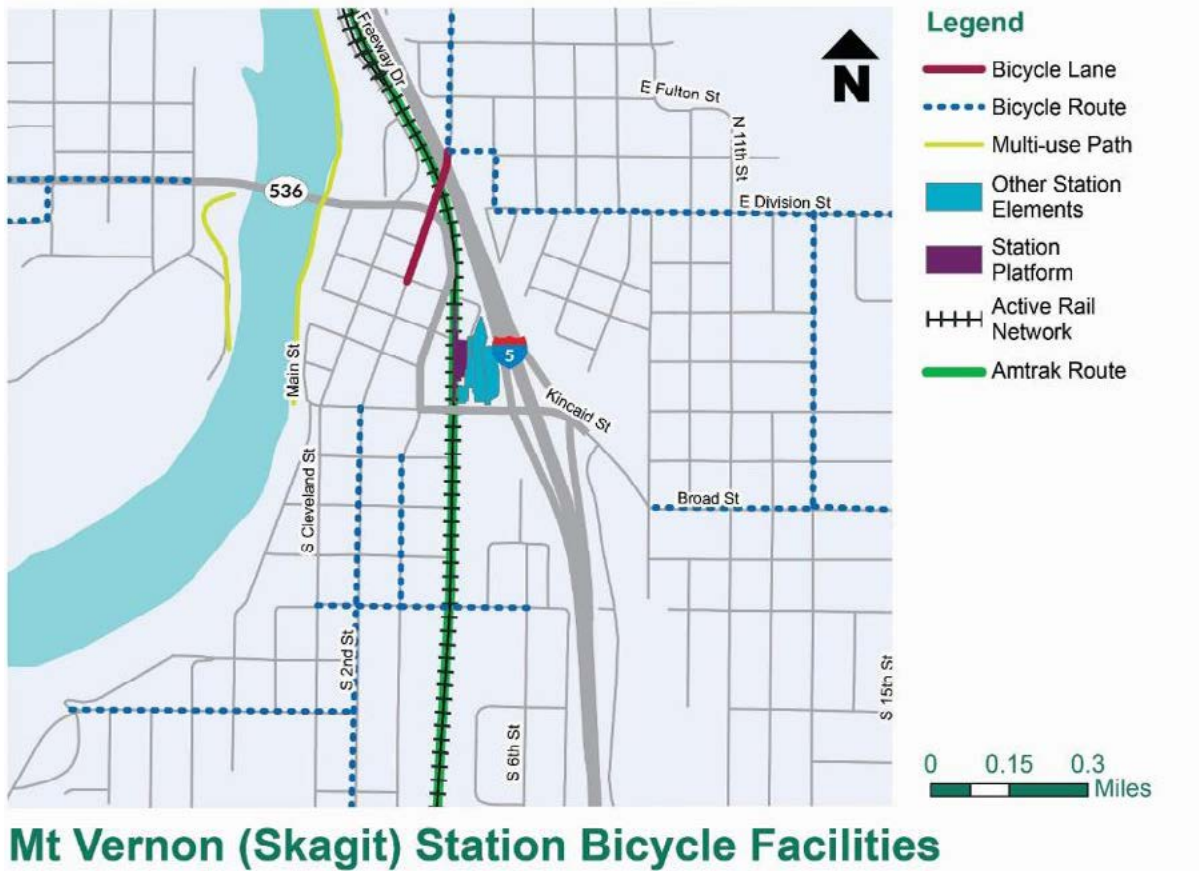


Figure-7: Bicycle Facilities



Supporting information - photo documentation

Site visits were conducted in Mt. Vernon on October 10, 2018 to inventory assets at the station and assess multimodal connections.



Skagit Station



Mt. Vernon city map at station.



Accessible drop-off/pick-up area.



Vending machines inside station.



Skagit Station interior.



Outdoor pedestrian area at transit station.

Bellingham, WA

Fairhaven Station
 401 Harris Ave
 Bellingham, WA 98225

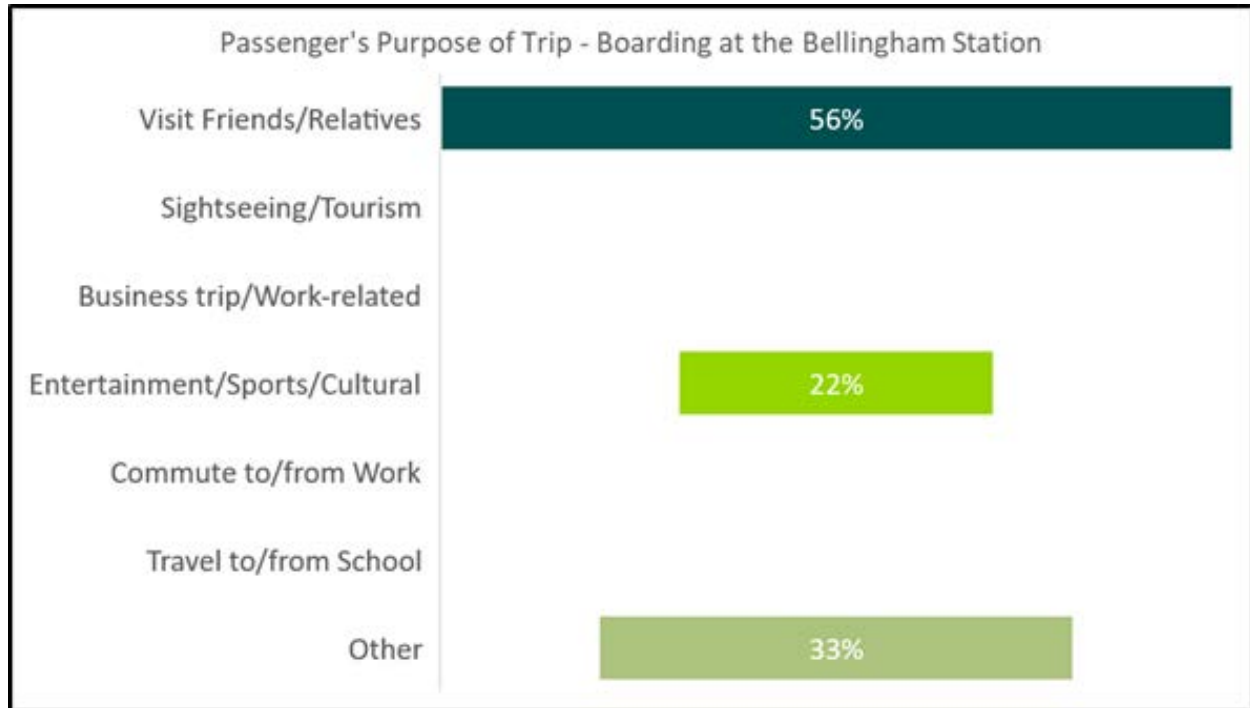


Station overview

Fairhaven Station in Bellingham serves Amtrak Cascades and local transit customers. The station, owned by the Port of Bellingham, is a mixed-use building with office tenants and a coffee shop. The station is located just outside of the downtown commercial area (approximately 3 miles) and is adjacent to the Bellingham Cruise Terminal, which serves as a terminal for the Alaska Marine Highway System ferry.

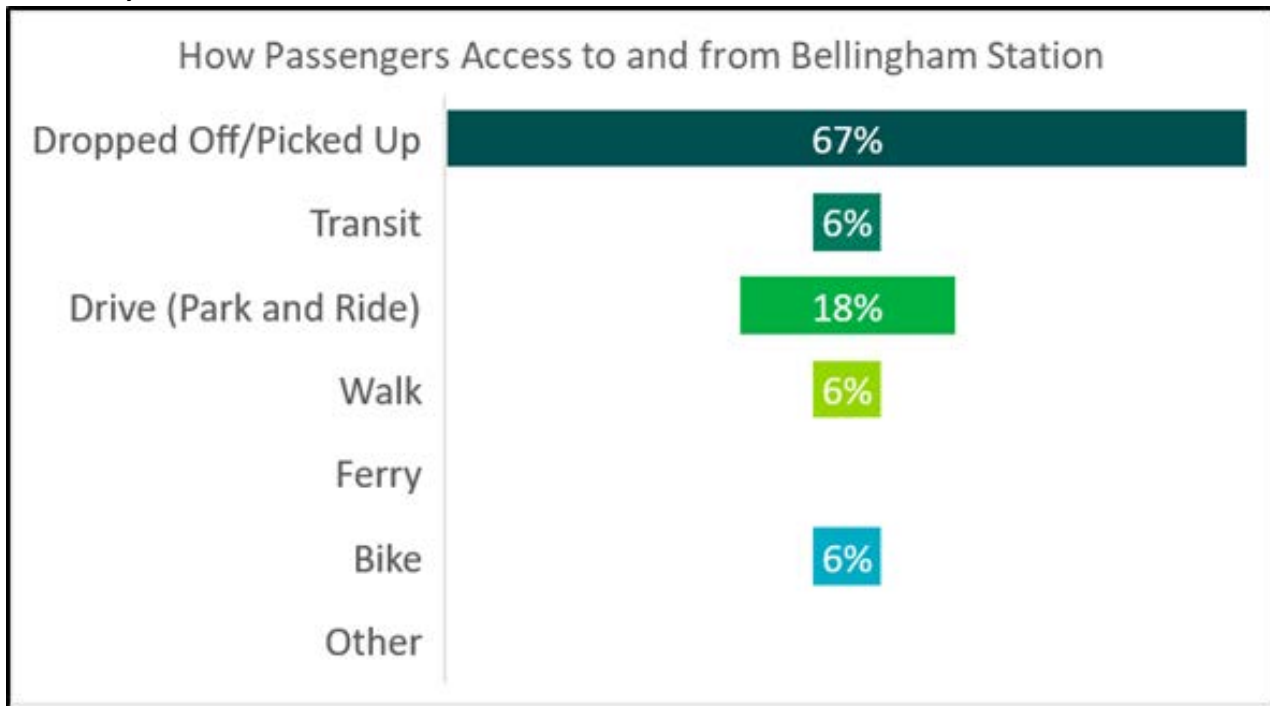
The station served approximately 50,000 passengers in 2017. Trip purpose and mode of access data gathered from a 2018 on-board passenger survey is summarized in Figures 1 and 2. (The on-board survey reached over 1,000 Amtrak Cascades passengers, producing statistically significant results for the corridor. However, at the station level, results may not be statistically significant, particularly at stations with lower ridership.)

Figure-1: Survey Results-Trip Purpose



Note: Survey respondents had the option of selecting more than one response.

Figure-2: Survey Results-Mode of Access



Note: Survey respondents had the option of selecting more than one response.

Parking and drop-off/pick-up

There are 52 short-term and 117 long-term parking spaces provided in surface parking lots at the station. Passengers who are parking and riding, have to cross the street through an unsignalized, but marked and signed crosswalk. There is also dedicated, accessible parking that is clearly marked.

A drop-off and pick-up area is provided in front of the station (taxi, transportation network companies, and human service transportation). Bus service is located on the east side of the station as described below.

Walk and transit access

There are two main streets that connect passengers to the station, Harris Avenue and 4th Street. Fourth Street has sidewalks connecting at the station, but quickly end when a person leaves the station area. Harris Avenue has an uninterrupted sidewalk on the north side of the street that connect east and west movements to the Fairhaven Historic District. The Port of Bellingham is improving the crossing at Harris Avenue to prepare for eventual quiet zone, and pedestrian and bike facilities are being added to the south side of Harris Avenue incrementally as parcels are developed.

While the exterior wayfinding signs appear focused on vehicular traffic, they do provide guidance for all modes of travel in the complex environment around Fairhaven Station and the Bellingham Cruise Terminal (Alaska Marine Highway System ferry).

Whatcom Transit services Fairhaven Station at the east end of the station area and has both benches and shelter for bus passengers. Intercity bus service (Greyhound) is served by a single large shelter adjacent to the train platform. There are two viable connections to the ferry terminal where passengers have to cross the railroad tracks at grade.

Bicycle access

Two bike routes identified in the City of Bellingham bicycle route map serve the station via Harris Avenue and 4th Street; neither of these is facility with on-street markings, however. Bicycle racks are provided at the station.

Connectivity analysis

As shown in Table 1, analysis of land use, mobility and transportation network measures for the Bellingham station yielded a connectivity score of 6.0, of a possible 10 points, indicating significant gaps in the existing connectivity of the station.

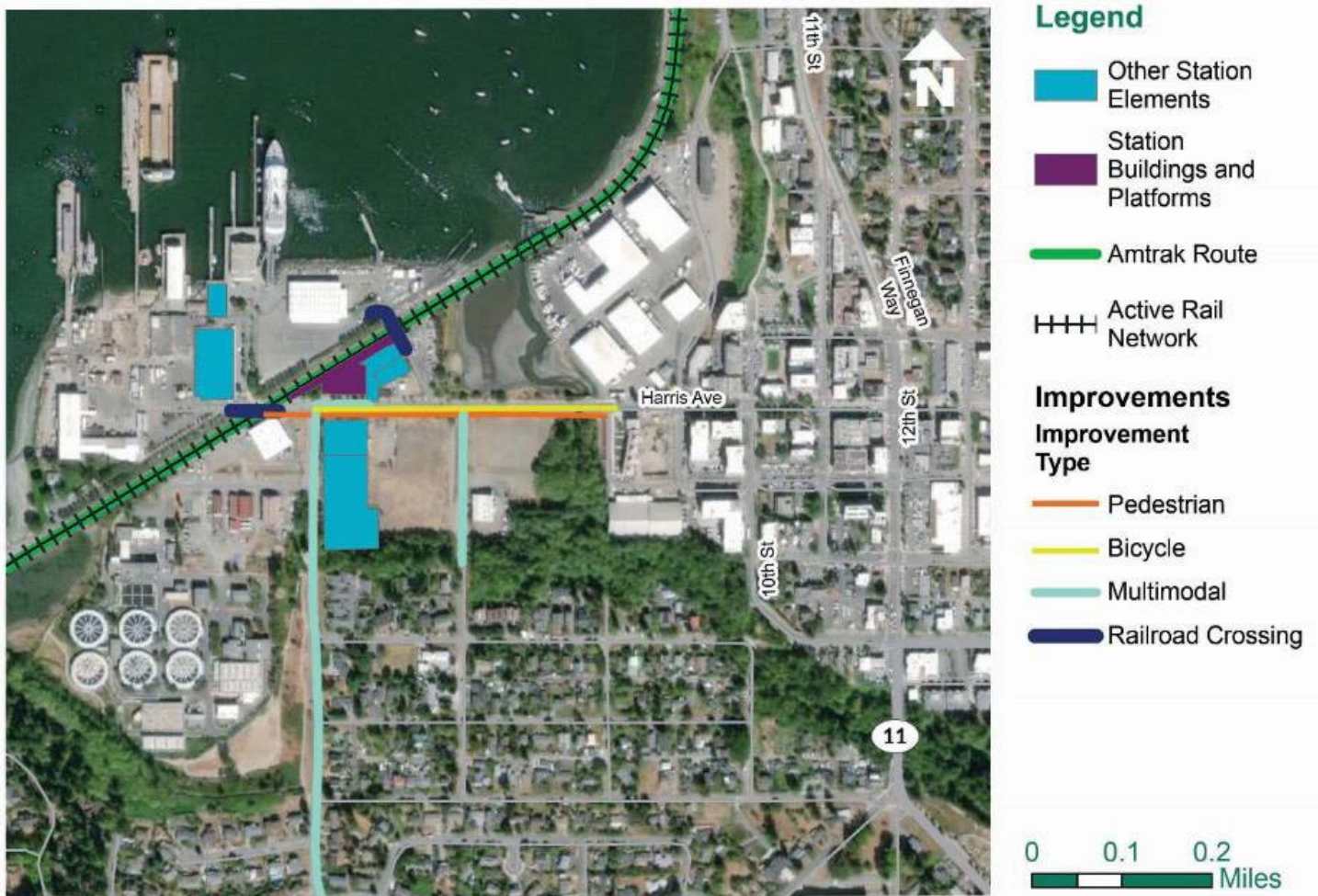
The station achieved high sub-scores in two categories: the station location context and the lower amount of crashes), and the regional Human Services Transportation Plan for the area. The analysis also highlights access issues surrounding the Bellingham station that include: a low number of attractors, a low number of zero car households, a low number of transportation connectivity options, and a low number of connecting transit routes and sidewalks.

Table 1. Connectivity Evaluation:		Bellingham			
Categories & Measures	Measures	Maximum Points	Maximum Score	Points	Score
LAND USE	2	6	2	4	1.3
Station Location Context & Attractors		3		3	
Zero Car Household		3		1	
MOBILITY	3	9	3	5	1.7
Transit Service		3		1	
Private Transportation Connection Options		3		1	
Human Services Transportation		3		3	
CONNECTED TRANSPORTATION NETWORK	5	15	5	9	3.0
At-Grade Railroad Crossings		3		2	
Sidewalks		3		1	
Bicycle Facilities		3		2	
Drop-off/Pick-up Areas		3		2	
Wayfinding		3		2	
Station Connectivity-Total	10	30	10	18	6.0

Candidate improvements

Based on the results of the connectivity analysis and field visits, Figure 3 and Table 2 identify candidate pedestrian, bicycle, multimodal and railroad crossing improvements that can be expected to enhance connectivity to Fairhaven Station and promote increased safety for all travel modes. These candidate improvements, including potential project examples and/or locations, were identified based on the system-wide candidate improvement types, analysis of existing connectivity gaps, and site visits. These representative examples may include facilities owned by the State, Amtrak, railroads or local agencies. WSDOT will further evaluate the viability of the opportunities identified here to improve state facilities for better access to Amtrak Cascades stations. Amtrak, railroads and local agencies can consider implementing improvements to their facilities and operations, similar to these representative examples, as they develop their capital improvement and service plans.

Figure-3: Candidate Improvements



Bellingham (Fairhaven) Station Candidate Improvements

Table 2. Opportunities to Enhance Connectivity at Fairhaven Station (Bellingham)

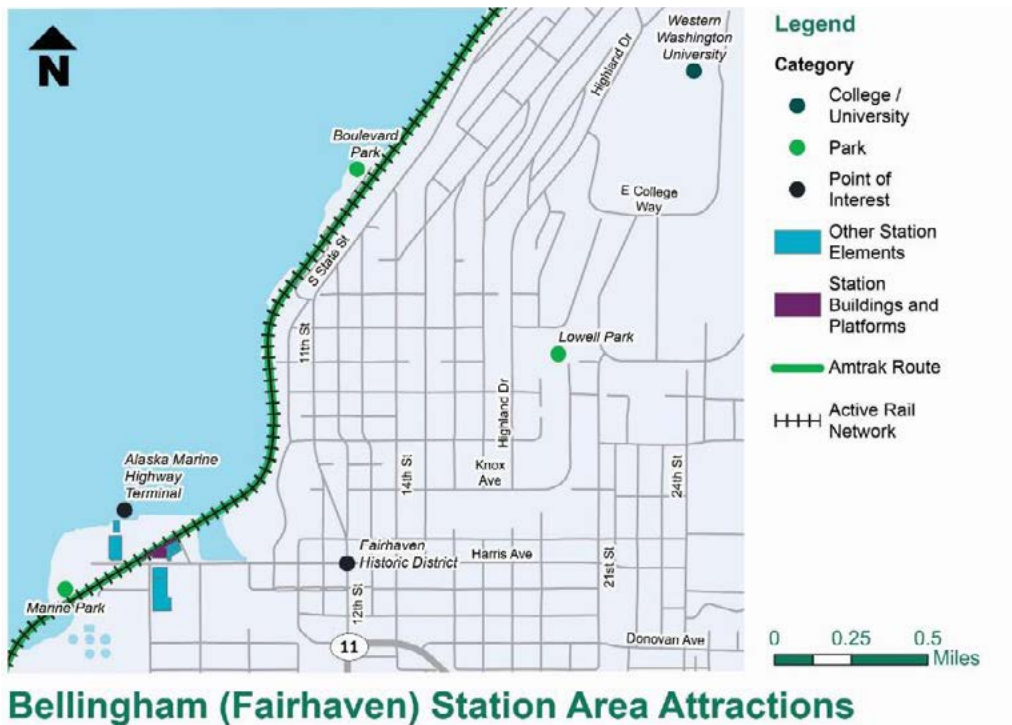
Type	Gaps	Candidate Improvement*	Potential Project Examples/ Locations*
Pedestrian	Complete sidewalks (curb, gutter, ramps)	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	Harris Avenue-Sidewalks on south side
Railroad Crossing	Consistent signing, striping, crossing gates, and crossing surface	Railroad crossing improvements	Harris Avenue and Ferry Access Road/Vehicle Landing
Multimodal	Pedestrian & bicycle network	Complete streets with bicycle lanes	4th Street: Harris Avenue to Bayside Rd.
Multimodal	Designated drop-off/pick-up area	Signing, striping, and additional designated drop-off/pick-up area for accessible/disabled transportation, either on-site or on-street at station areas	Harris Avenue
Bicycle	Bicycle lanes	Bicycle facility improvements within 1/2-mile radius of station	Harris Avenue

*WSDOT will work with stakeholders to improve access and connectivity to Amtrak Cascades stations. Local jurisdictions, transit agencies, Amtrak and railroads could consider addressing these opportunities when implementing their capital improvement and service development plans; some of the opportunities identified may also be addressed in these existing plans.

Supporting information - connectivity analysis

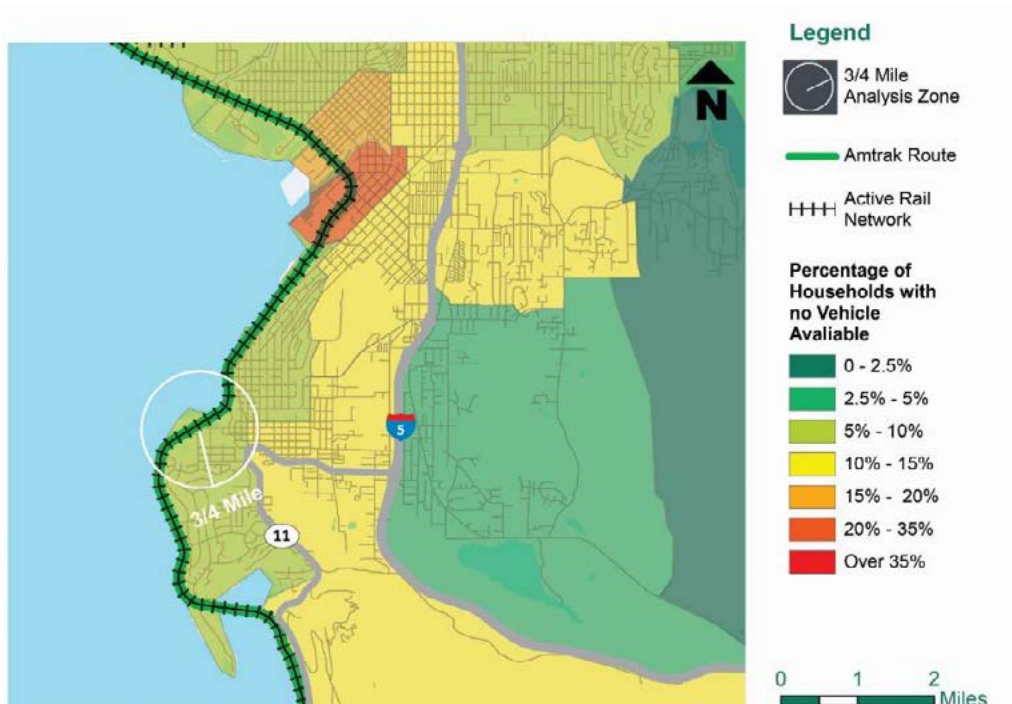
The summary results and connectivity score for the Bellingham station are supported by geospatial representations of four measured criteria (attractors, zero car households, sidewalks, and bicycle facilities) presented in the figures below and in Table C-1. Multimodal Connectivity Analysis: Observed Data & Assignment of Points.

Figure-4: Station Context-Attractors



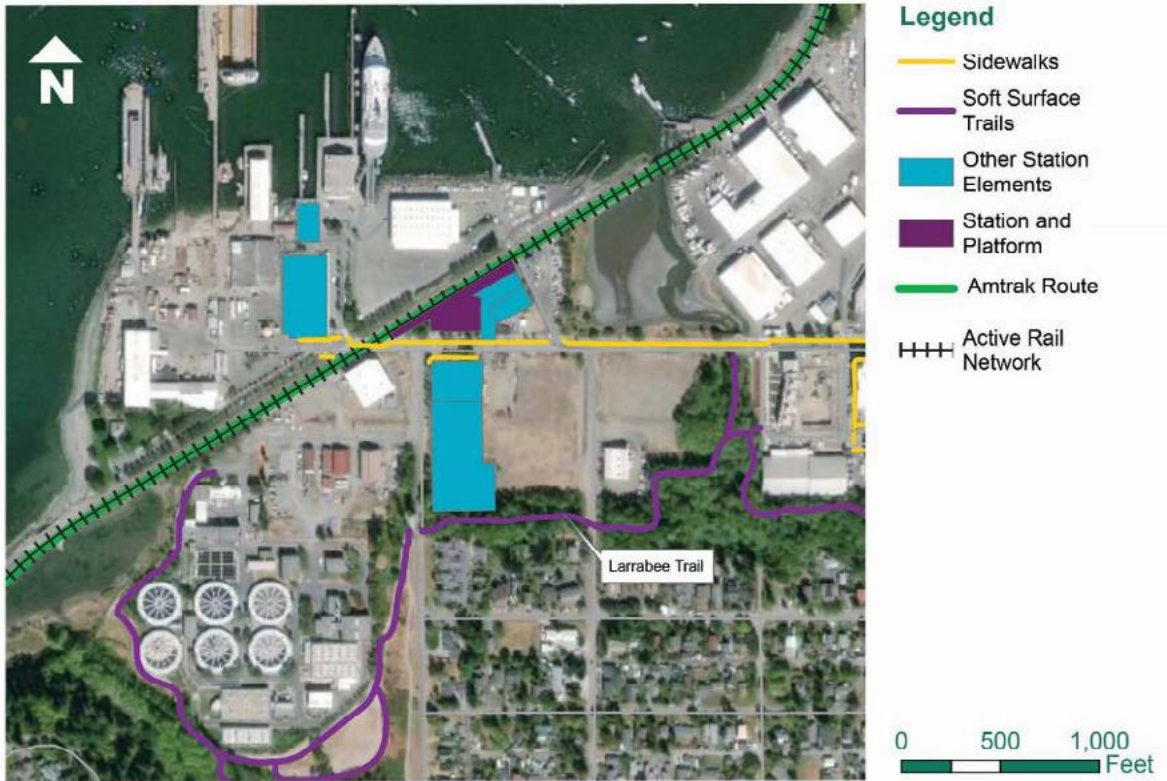
Bellingham (Fairhaven) Station Area Attractions

Figure-5: Zero-Car Households



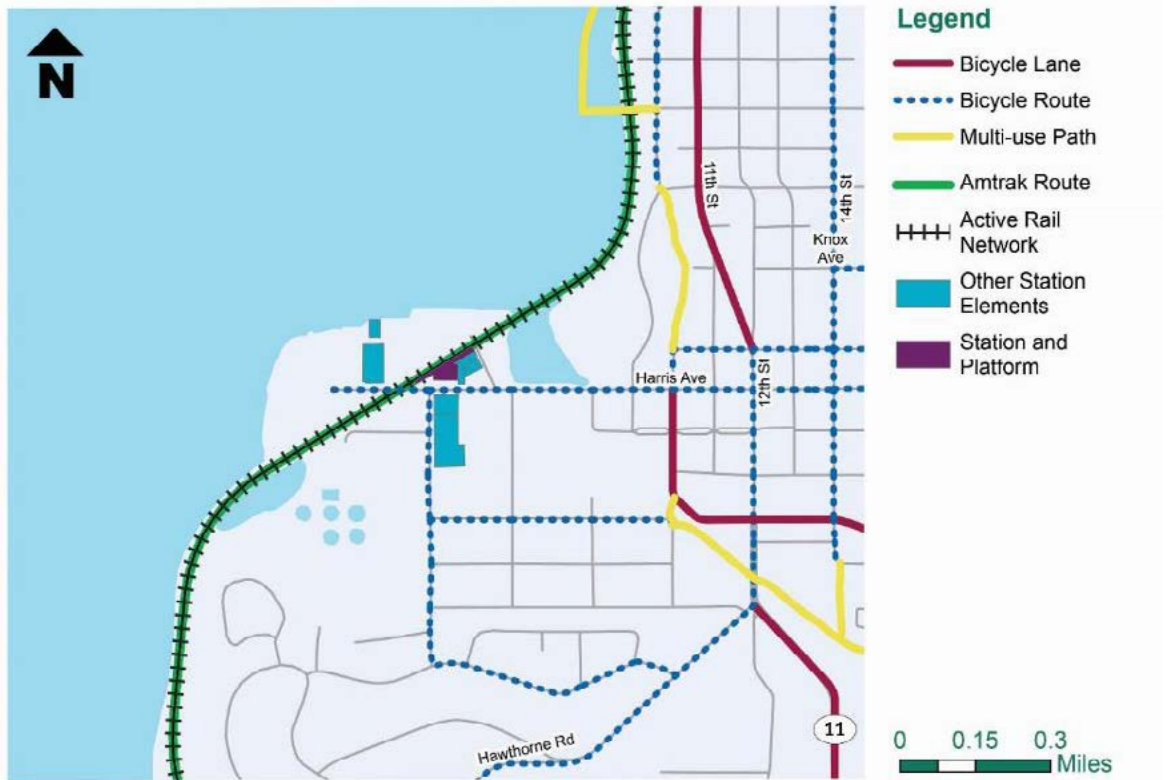
Bellingham Station Vehicle Availability by Household

Figure-6: Sidewalks



Bellingham (Fairhaven) Station Sidewalks

Figure-7: Bicycle Facilities



Bellingham (Fairhaven) Station Bicycle Facilities

Supporting information - photo documentation

Site visits were conducted in Bellingham on October 10, 2018 to inventory assets at the station and assess multimodal connections.



Local transit connection and ADA parking spots.



Connections to Bellingham Cruise Terminal.



At-grade railroad crossing looking at station platform.



Connected sidewalks to Fairhaven District.



Bellingham Station platform and shelter with bicycle racks.

Vancouver, British Columbia

Pacific Central Station
 1150 Station St
 Vancouver, BC, Canada V6A 4C7



Station overview

The Pacific Central Station near downtown Vancouver, British Columbia is a multimodal hub owned and operated by VIA Rail. The station that provides customers with access to: Canadian intercity passenger rail (VIA Rail), the Vancouver SkyTrain, long-distance bus routes, and local bus connections. The station is located within the False Creek Flats neighborhood southeast of Downtown Vancouver, near high-density residential areas, and adjacent to light industrial and commercial areas.

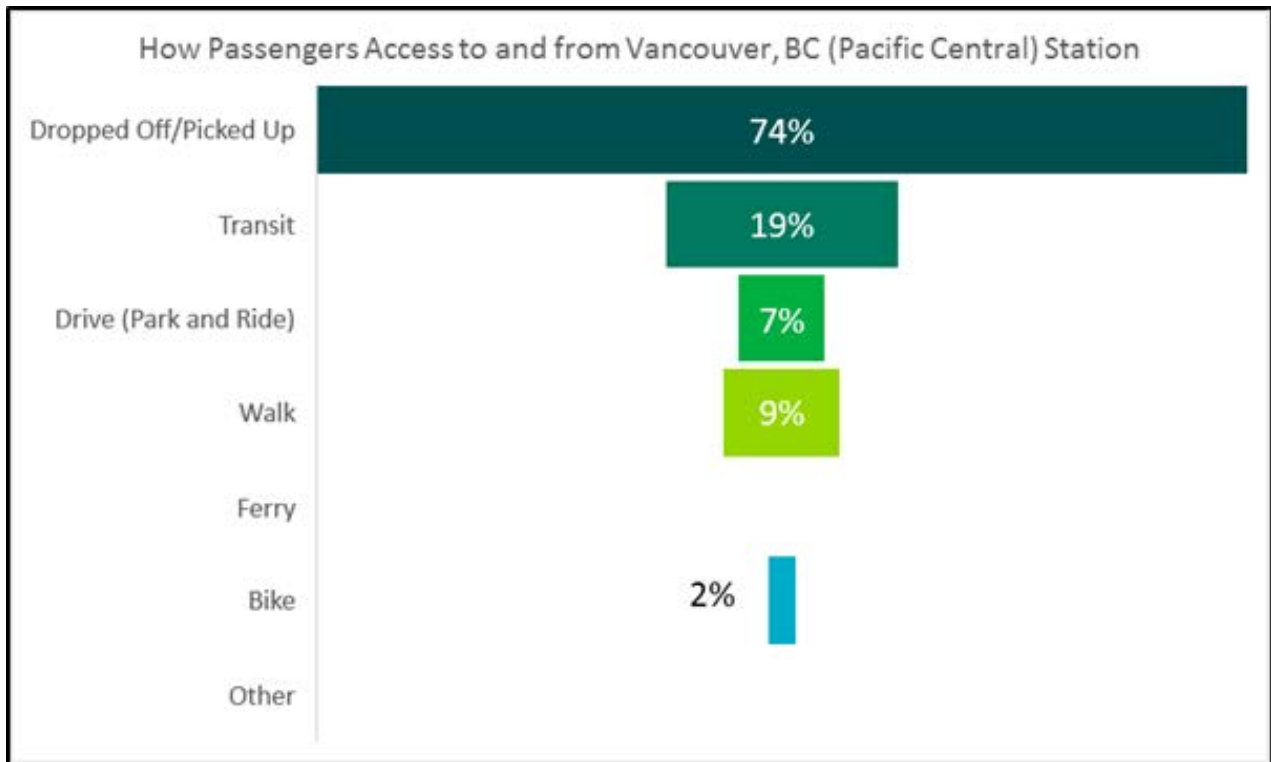
The station served approximately 167,000 passengers in 2017. Trip purpose and mode of access data gathered from a 2018 on-board passenger survey is summarized in Figures 1 and 2. (The on-board survey reached over 1,000 Amtrak Cascades passengers, producing statistically significant results for the corridor. However, at the station level, results may not be statistically significant, particularly at stations with lower ridership.)

Figure-1: Survey Results-Trip Purpose



Note: Survey respondents had the option of selecting more than one response

Figure-2: Survey Results-Mode of Access



Note: Survey respondents had the option of selecting more than one response

Parking and drop-off/pick-up

The station has 20 short-term parking spaces, including dedicated accessible parking spaces, provided in a surface parking lot.

The station features a clearly delineated pick-up/drop-off area with a dedicated taxi stand. Currently, local regulations prohibit services such as Uber.

Walk and transit access

From a pedestrian standpoint, Vancouver Pacific Central Station is highly integrated into the pedestrian and transit environment. From the primary station entrance to Station Street, the sidewalk network surrounding the station appears complete. One exception is the northern boundary of the station. National Avenue has only a soft shoulder separated from traffic via temporary curbing from Station Street to Trillium Park.

Within Pacific Central Station wayfinding signs are highly visible and clearly indicate station features. This is especially important given the high level of segregation between VIA Rail and Amtrak services due to customs requirements. While there are significant additional transit opportunities in the vicinity of the station, there is little pedestrian oriented wayfinding outside of the station building. This is mitigated by the visual prominence of the SkyTrain elevated rail station south of the Pacific Central Station building.

Several alternative modes of travel are available at or near Pacific Central Station. TransLink’s SkyTrain Expo Line Main Street - Science World Station is within a block of the Amtrak station. SkyTrain can be used to access Vancouver International Airport, the main passenger airport for British Columbia. Several TransLink bus routes also have stops within a block of Pacific Central Station. The main long-distance bus terminal for Vancouver is located within the station.

Bicycle access

The City of Vancouver has substantial bicycle infrastructure, but most of the streets surrounding Pacific Central Station do not have any bicycle specific improvements. While there have been few improvements made to the immediate street network surrounding the station, these roads are generally low volume and connect to improved facilities within a few blocks. There are bicycle parking (racks) at Pacific Central Station.

Connectivity analysis

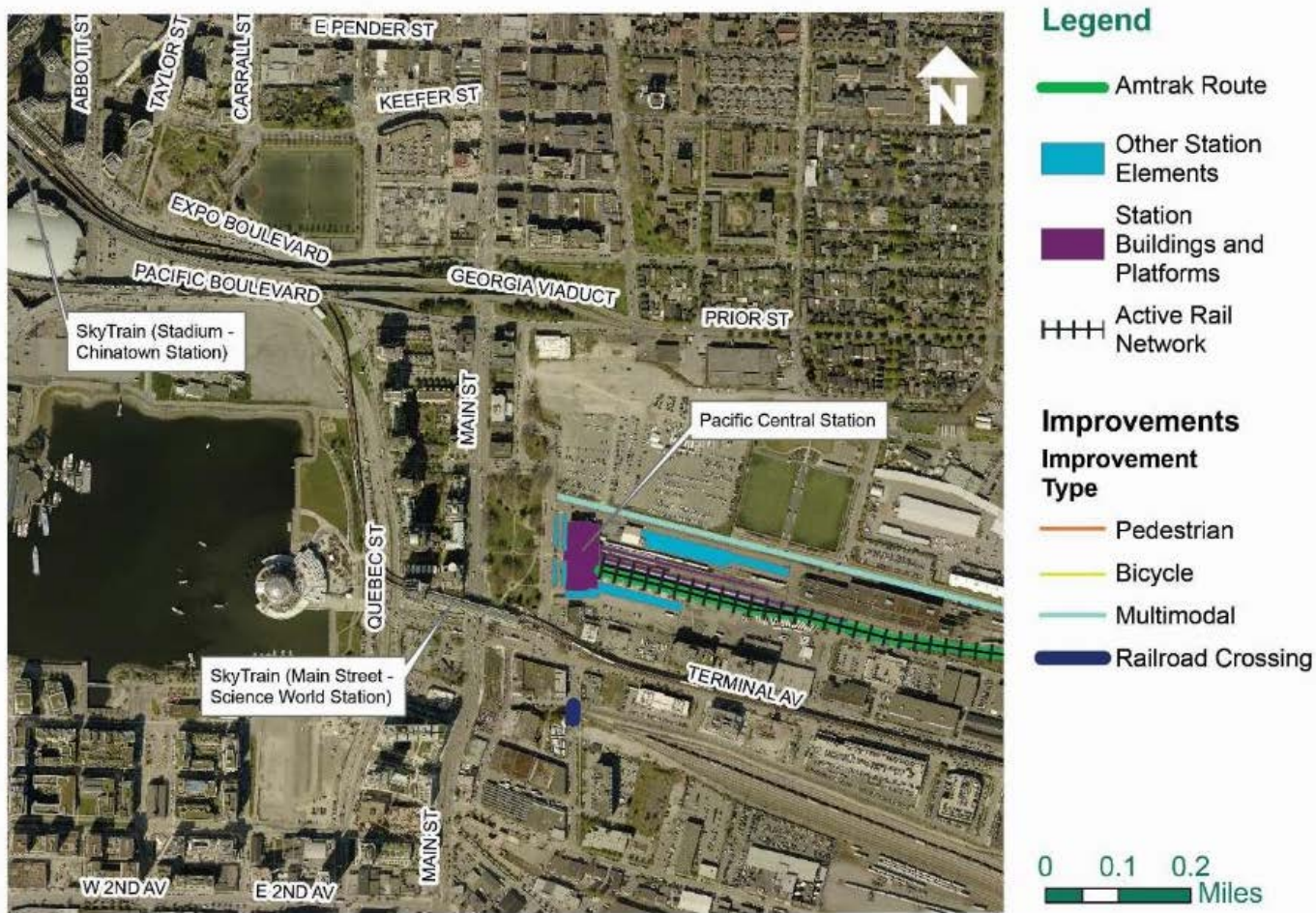
As shown in Table 1, analysis of land use, mobility and transportation network measures for the Vancouver BC station yielded a connectivity score of 8.2 of a possible 10 points, indicating only minor gaps in the existing connectivity of the station.

Table 1. Connectivity Evaluation: Vancouver, BC					
Categories & Measures	Measures	Maximum Points	Maximum Score	Points	Score
LAND USE	1	3	2	3	2.0
Station Location Context & Attractors		3		3	
MOBILITY	2	6	3	3	1.5
Transit Service		3		2	
Private Transportation Connection Options		3		1	
CONNECTED TRANSPORTATION NETWORK	5	15	5	14	4.7
At-Grade Railroad Crossings		3		2	
Sidewalks		3		3	
Bicycle Facilities		3		3	
Drop-off/Pick-up Areas		3		3	
Wayfinding		3		3	
Station Connectivity-Total	8	24	10	20	8.2
Note: Due to data limitations, fewer measures and points are applicable to the Vancouver, B.C. station. Same maximum scores used in other station’s connectivity analysis are applied to Vancouver B.C. station to match the 10-point scale for consistency and comparability purpose.					

Candidate improvements

Based on the results of the connectivity analysis and field visits, Figure 3 and Table 2 identify candidate pedestrian, bicycle, multimodal and railroad crossing improvements that can be expected to enhance connectivity to Pacific Central Station and promote increased safety for all travel modes. These representative examples may include facilities owned by railroads or local agencies. Railroads and local agencies can consider implementing improvements to their facilities and operations, similar to these representative examples, as they develop their capital improvement and service plans.

Figure-3: Candidate Improvements



Vancouver BC (Pacific Central) Station Candidate Improvements

Table 2. Opportunities to Enhance Connectivity at Pacific Central Station (Vancouver, B.C.)

Type	Gaps	Candidate Improvement*	Potential Project Examples/Locations*
Pedestrian	Complete sidewalks (curb, gutter, ramps)	Sidewalk improvements, lighting, and other pedestrian amenities within 1/4-mile radius of stations	National Avenue: Station Street to Chess Street
Railroad Crossing	Consistent signing, striping, crossing gates, and crossing surface.	Railroad crossing improvements	Station Street and Northern Street
Multimodal	Wayfinding signs	Install additional wayfinding signs in station area	Locations to be determined

*Local jurisdictions, transit agencies, Amtrak and railroads could consider addressing these opportunities when implementing their capital improvement and service development plans; some of the opportunities identified may also be addressed in these existing plans.

Supporting information - connectivity analysis

The summary results and connectivity score for the Vancouver, BC station are supported by geospatial representations of four measured criteria (attractors, zero car households, sidewalks, and bicycle facilities) presented in the figures below and in Table C-1. Multimodal Connectivity Analysis: Observed Data & Assignment of Points.

Figure-4: Station Context-Attractors

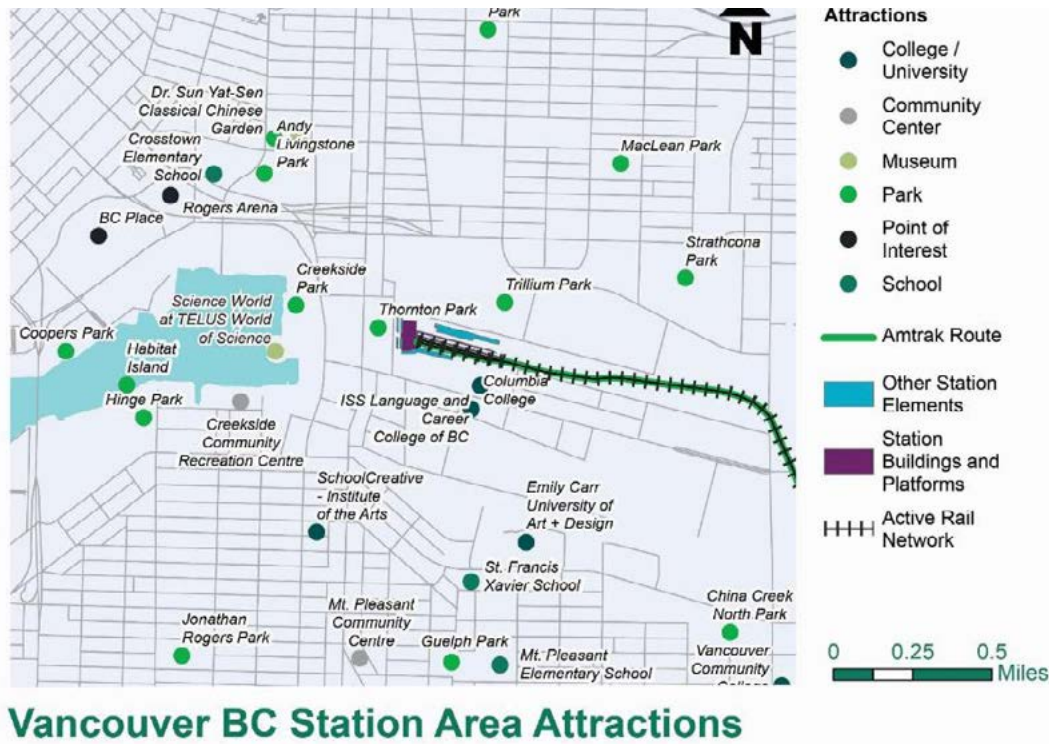


Figure-5: Sidewalks

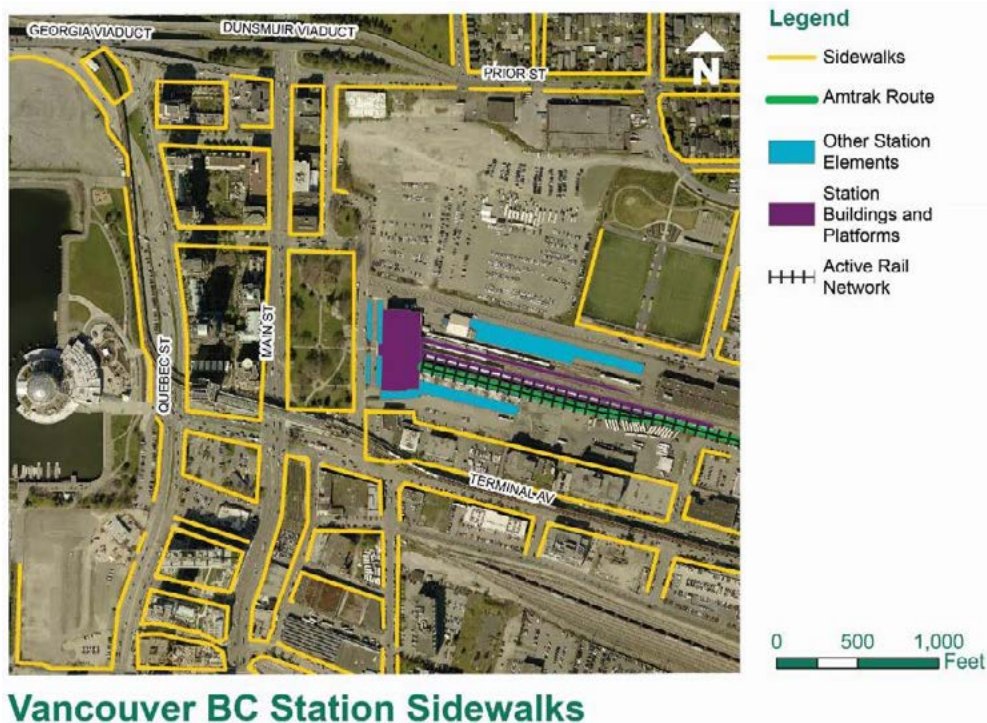
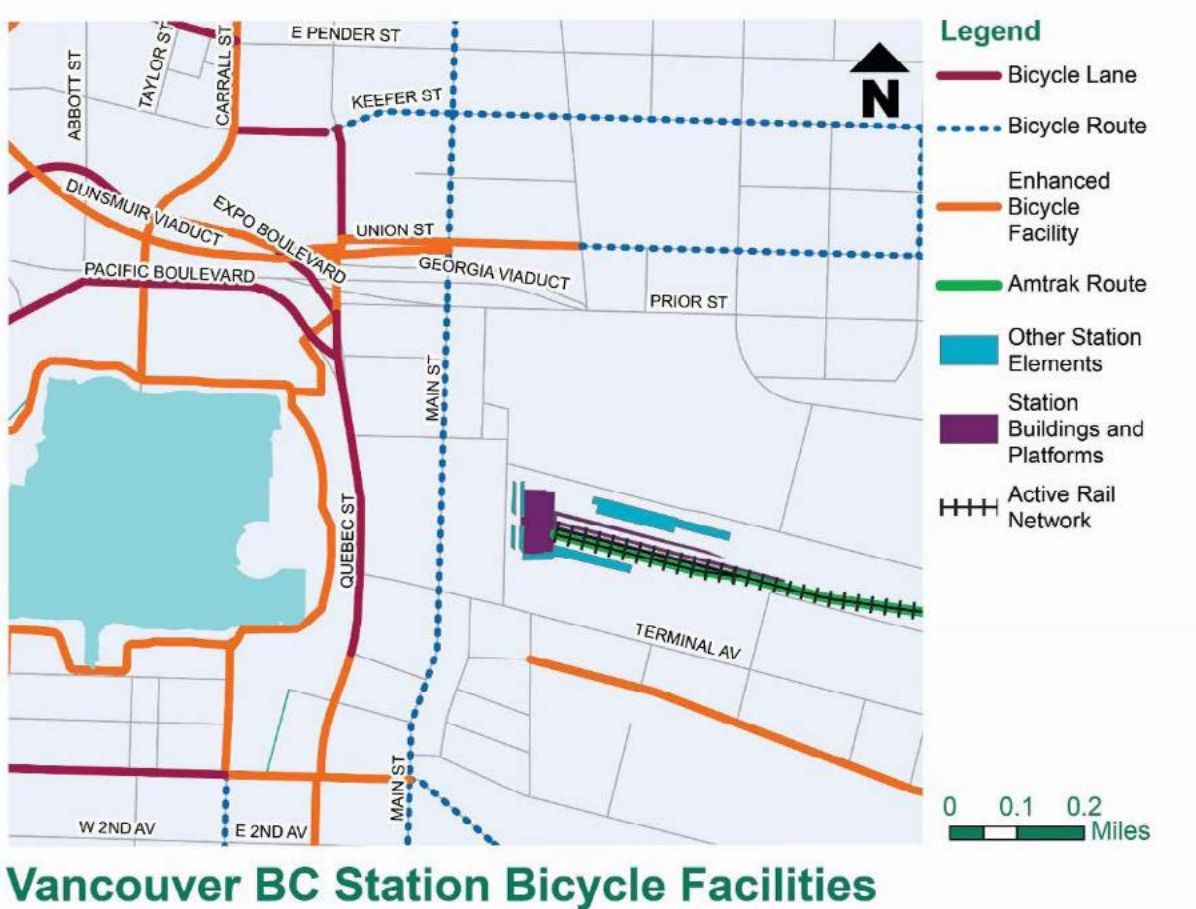


Figure-6: Bicycle Facilities



Supporting information - photo documentation

Site visits were conducted in Vancouver, BC on October 10, 2018 to inventory assets at the station and assess multimodal connections.



Local bus stop and elevated SkyTrain platform.



Fare gates restricting access to SkyTrain platform.



Wayfinding sign for bicycle parking.



Ticketing counter.



Striped drop off and pick up area in front of station.



Interior of station.

Table C-1. Multimodal Connectivity Analysis: Observed Data & Assignment of Points

	Portland, OR	Vancouver, WA	Kelso Longview	Centralia	Olympia Lacey	Tacoma	Tukwila	Seattle	Edmonds	Everett	Stanwood	Mount Vernon	Bellingham	Vancouver, BC
LAND USE														
Station Location Context & Attractors														
Observed Data	Urban Center / Significant Attractors	Industrial Commercial; 1/2 Mile from Urban Center / Attractors	Main Street / vResidential with Limited Attractors	Main Street / Residential with Limited Attractors	Rural / No Attractors	Industrial / Mixed Use with Attractors	Commercial with Attractors	Urban Center / Significant Attractors	Main Street / Residential with Attractors	Industrial / Commercial with Attractors	Main Street / Rural with No Attractors	Main Street with Attractors	Residential / Main Street with Attractors	Urban Center / Significant Attractors
Points	3	1	3	3	1	2	2	3	3	2	2	3	3	3
Zero Car Households														
Observed Data	3	High	High	High	Low	Medium	Medium	High	Low	High	Low	Low	Low	n/a
Points	3	3	3	3	1	2	2	3	1	3	1	1	1	n/a
MOBILITY														
Transit Service														
Observed Data	6	0	4	3	2	14	2	26	4	18	6	12	2	7
Points	2	0	1	1	1	3	1	3	1	3	2	3	1	2
Private Transportation Connection Options														
Observed Data	4	2	2	2	2	4	2	3	2	2	2	2	2	2
Points	3	1	1	1	1	3	1	2	1	1	1	1	1	1
Human Services Transportation														
Observed Data	2	2	2	3	3	2	2	2	2	3	3	3	3	n/a
Points	2	2	2	3	3	2	2	2	2	3	3	3	3	n/a
CONNECTED TRANSPORTATION NETWORK														
At-Grade Railroad Crossings														
Observed Data	0	2	0	3	0	1	0	0	3	1	1	2	1	1
Points	3	1	3	0	3	2	3	3	0	2	2	1	2	2
Sidewalks														
Observed Data	High	Low	High	High	Low	High	Medium	High	High	High	Medium	Medium	Low	High
Points	3	1	3	3	1	3	2	3	3	3	2	2	1	3
Bicycle Facilities														
Observed Data	High	Low	Low	Low	Low	Medium	Medium	High	Medium	Low	Low	Medium	Medium	High
Points	3	1	1	1	1	2	2	3	2	1	1	2	2	3

	Portland, OR	Vancouver, WA	Kelso Longview	Centralia	Olympia Lacey	Tacoma	Tukwila	Seattle	Edmonds	Everett	Stanwood	Mount Vernon	Bellingham	Vancouver, BC
Drop-off/Pick-up Areas														
Observed Data	2	0	1	1	1	2	3	2	1	3	3	2	2	3
Points	2	0	1	1	1	2	3	2	1	3	3	2	2	3
Wayfinding														
Observed Data	5	5	3	3	3	6	4	8	7	6	3	5	5	6
Points	2	2	1	1	1	3	1	3	3	3	1	2	2	3

v