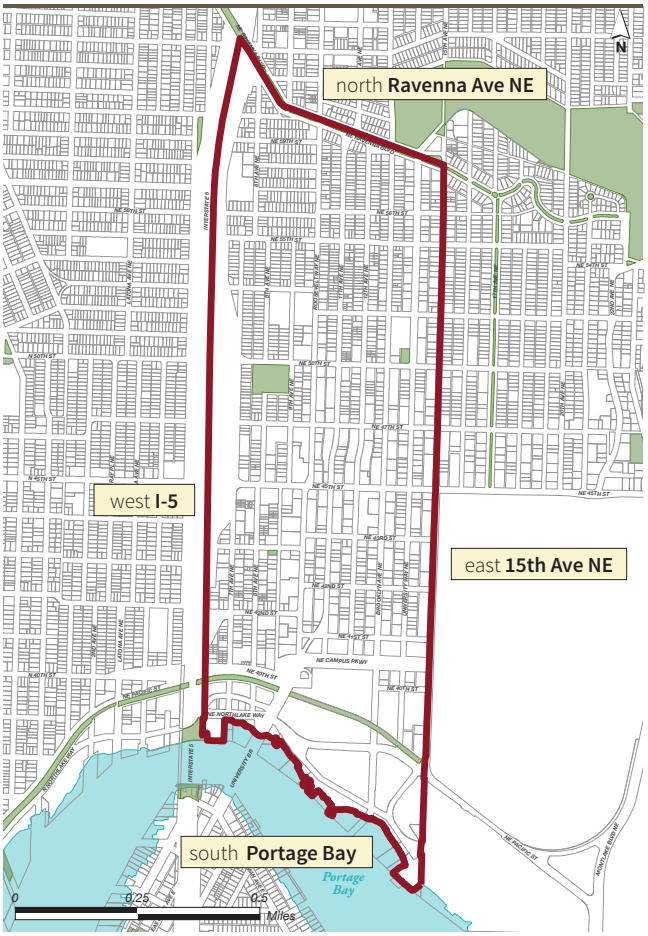
3.5 Transportation

This section presents a multimodal transportation analysis prepared to evaluate the potential impacts from enacting proposed zoning changes in the U District study area. The section presents existing transportation conditions in the U District, as well as future transportation conditions under three alternatives—one "No Action" alternative representing the condition if zoning remains the same and two "action" alternatives with new zoning provisions. Significant transportation impacts and potential mitigation measures are identified for each future action alternative based on the policies and recommendations established in state and local plans.

Fig. 3.5–1
U District Study Area Boundaries



3.5.1 Affected Environment

This section describes the existing conditions of the area that would be affected by the proposed action alternatives.

The U District study area is located just north of Portage Bay in Seattle. The study area is adjacent to the Wallingford, Roosevelt, and Ravenna neighborhoods, as well as the University of Washington (UW) campus. As shown in Figure 3.5–1, the study area is bounded by Interstate 5 (I–5) to the west, 15th Avenue NE to the east, NE Ravenna Boulevard to the north, and Portage Bay to the south.

Existing Transportation Network

This section describes the existing transportation network in the U District for all modes, including pedestrians, bicycles, transit, autos, and freight.

PEDESTRIAN NETWORK

Pedestrian access to the study area is limited on the west side by I–5. Pedestrians can access the U District from the west at NE Ravenna Boulevard, NE 50th Street, NE 45th Street, NE 40th Street, the Burke-Gilman Trail, and NE Northlake Way. Several of these crossings are in close proximity to each other at the south end of the study area. However, the distance between the NE 40th Street, NE 45th Street, NE 50th Street, and NE Ravenna Boulevard crossings range from approximately a quarter of a mile to three-quarters of a mile, limiting pedestrian accessibility to the U District from the west.

Pedestrian access from the north and east is excellent. Given that the south end of the study area is bounded by Portage Bay, there are limited connections. The most direct route into the study area is along the University Bridge. Pedestrians may also use the Montlake Bridge, which is located to the east of the study area.

Cracked and narrow sidewalk

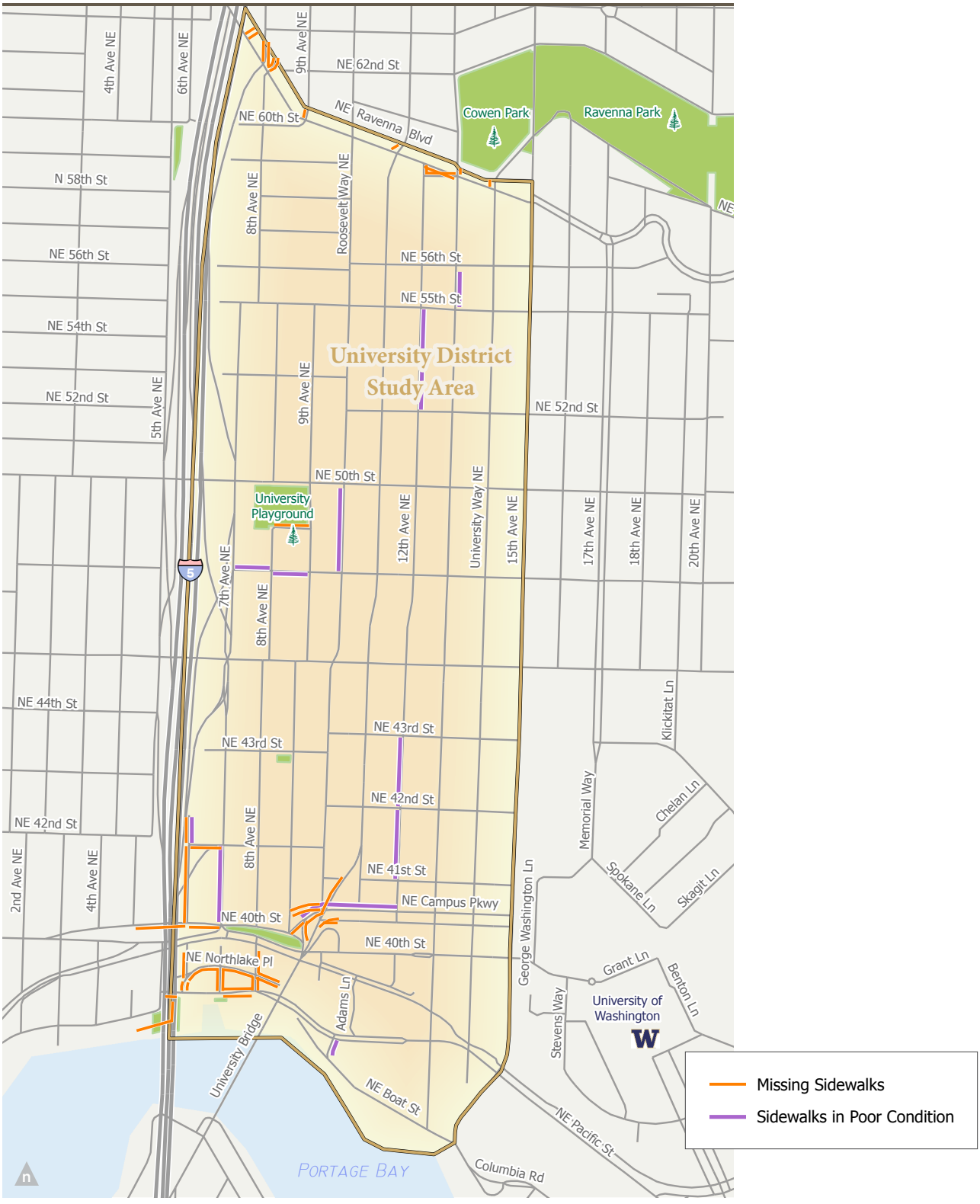
Sidewalks are provided along almost all roadways in the study area. Figure 3.5–2 shows missing sidewalk segments, which are generally near the freeway, freeway off-ramps, and cul-de-sacs, as well as sidewalks that the Seattle Department of Transportation (SDOT) has categorized as being in poor condition. Sidewalk condition within the study area varies from new, wide sidewalks at recent developments to narrower, cracked sidewalks in older areas.

Pedestrian Crossings

North end of University Bridge

Blocks are generally much longer in the north-south direction than in the east-west direction. This facilitates better connectivity for north-south travel since there are many more available routes. The north end of the University Bridge and I–5 have both been identified as locations that are difficult to cross in various City planning documents. Frequent signals along major roadways such as NE 45th Street, NE 50th Street, and 15th Avenue NE allow pedestrians to cross at convenient intervals.

Figure 3.5–2: **Existing Pedestrian Facilities**



Source: City of Seattle, 2012

Marked mid-block pedestrian crossings are provided at:

- 15th Avenue NE, north of NE Pacific Street
- University Way NE, north of NE 43rd Street
- University Way NE, north of NE 45th Street
- University Way NE, north of NE 50th Street
- Brooklyn Avenue NE, north of NE 43rd Street

A pedestrian bridge over 15th Avenue NE connects NE Campus Parkway to the UW campus.

Burke-Gilman Trail

Multi-Use Paths

The U District has one multi-use path, the Burke-Gilman Trail, through the southern portion of the study area. This trail connects to the west to Fremont and to the east to the UW and beyond towards Magnuson Park. The trail continues north along Lake Washington to the City of Kenmore, where it connects to the East Lake Sammamish Trail.

The portion of the Burke-Gilman Trail through the study area is owned by UW. The University is planning improvements to the trail immediately east of the study area (between 15th Avenue NE and Rainier Vista) during 2014 and 2015. The trail will be widened and separate pedestrians and bicycles along that segment. UW will continue pursuing additional funding for other segments.

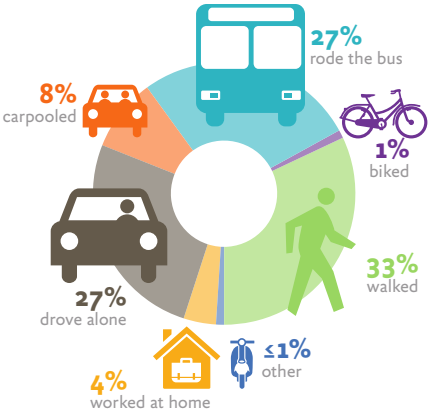
Pedestrian Volumes

American Community Survey (ACS) estimates indicate that 74% of workers 16 years and older in the U District used a non-single occupant vehicle (SOV) mode for work/school trips (33% walked, 27% used public transportation, 9% carpooled, 1% biked, and 4% telecommuted or used other modes). This non-SOV percentage is much higher than the average Seattle non-SOV mode share of 41%. Additionally, the estimated walk mode split of 33% indicates that walking constitutes nearly half of all non-SOV trips made in the U District.[1] Roughly one-quarter of all auto trips are carpool trips.

Pedestrian activity is highest in the core of the U District, particularly in the vicinity of University Way NE. The south end of the study area also has substantial pedestrian activity due to the presence of academic buildings and residence halls. Pedestrian activity is lower in the northern portion of the study area where the land use is dominated by residential uses.

U District Commute/ School Trip Mode Share

33%	Walk
27%	Transit
27%	Single Occupant Vehicle
8%	Carpool
1%	Bike
4%	Tlecommuted or used other modes



Source: ACS, 2006-2010

1 *Data from the 2006 to 2010 American Community Survey Estimates, US Census Bureau. Aggregated information collected from the Urban Design Framework – Existing Conditions, City of Seattle, 2012*

BICYCLE NETWORK

The bicycle network includes a variety of facilities, including bike lanes, sharrows, and a multi-use trail. As shown in Figure 3.5–3 on the following page, bicycle lanes are provided on the Roosevelt Way NE/11th Avenue NE couplet and continue across the University Bridge to the south. Bicycle lanes are also provided on portions of NE 40th Street, NE Pacific Street, and NE Ravenna Boulevard. In addition, there are climbing lanes in the uphill direction and sharrows in the downhill direction on University Way NE from NE Pacific Street to NE Campus Parkway, and on University Way NE from NE 50th Street to Ravenna Boulevard NE. Sharrows are provided on NE 45th Street (and continue west across the I–5 overpass), 7th Avenue NE from NE 45th Street to NE 50th Street, and University Way from NE Campus Parkway to NE 50th Street. The NE 50th Street overpass does not include any bicycle facilities. As mentioned previously, the Burke-Gilman Trail runs through the southern portion of the U District and is heavily used by commuters and recreational bicyclists.

Bicycles outside Trader Joe's

Bicycle Volumes

Bicycle counts for select locations have been collected by the City of Seattle on a quarterly basis during the off-peak (10 AM–12 PM), PM peak (5–7 PM), and Saturday midday (12–2 PM). These include two intersections within or near the study area: NE 45th Street and Brooklyn Avenue NE, and Eastlake Avenue E and Furhman Avenue E (University Bridge). Table 3.5–1 summarizes the bicycle counts at these two locations for three days in September 2012. Bicycle activity is higher on the University Bridge than in the core of the U District, reflecting the fact that the University Bridge is a key bicycle commuter thoroughfare.

A "sharrow" is a marking painted on the travel lane indicating that vehicles must share the lane with bicycles.

Sharrow lane marking

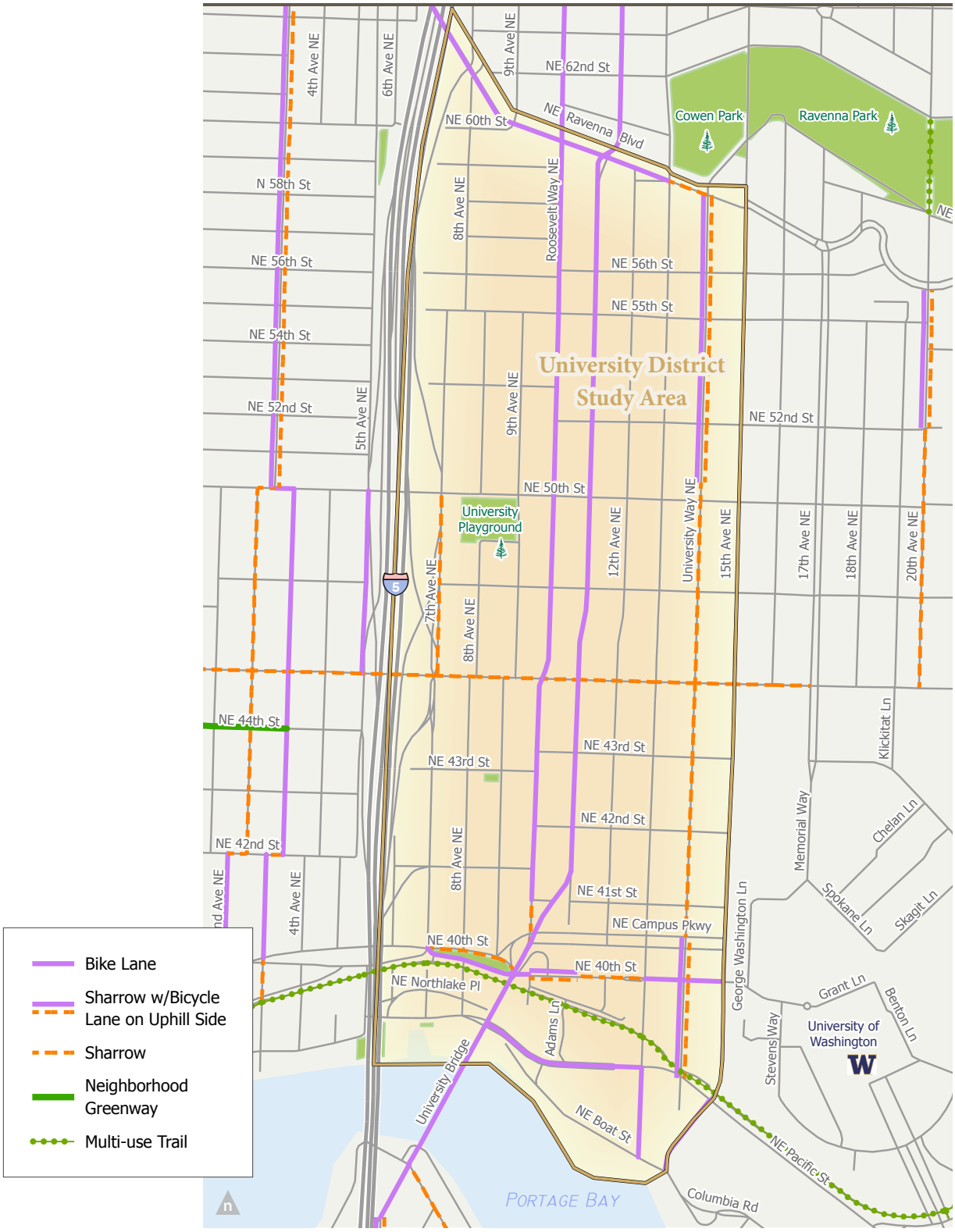
Table 3.5–1: **September 2012 Bicycle Counts**

Location	Off Peak 10AM–12PM	PM Peak 5–7PM	Saturday 12–2PM
NE 45th Street & Brooklyn Avenue NE	68	100	40
Eastlake Ave. E & Furhman Ave. E (University Bridge)	139	433	168

*Total may differ from sum due to rounding during calculation.

Source: Seattle Department of Transportation, 2012

Figure 3.5–3: **Existing Bicycle Facilities**



Source: City of Seattle, 2012

TRANSIT SERVICES

As stated previously, ACS data indicates a 27% transit mode share in the U District. The U District attracts many transit trips because of the UW campus and related employment centers in the area, as well as the transfer opportunities to other transit routes. Transit is heavily utilized in the area, and during the peak hour commutes, buses are often full with standing room only. The 2012 Transit Master Plan identified bus stops with over 100 boardings per day.[2] These include the following locations: along NE Campus Parkway, Brooklyn Avenue NE, 15th Avenue NE south of NE 45th Street, NE Pacific Street between 15th Avenue NE and Montlake Boulevard NE, Roosevelt Way NE, NE 45th Street and NE 42nd Street.

Table 3.5–2 on the following page outlines the King County Metro, Sound Transit, and Community Transit operated routes through the study area. Routes are divided into five categories: service throughout the day, service during the peak hours only, service in the peak direction only, service in the peak direction with some outbound off-peak trips, and night owl service routes. Some routes operate with reduced service when the University of Washington is not in session.

Peak hour only and peak direction only routes are generally transit routes that travel long distances such as to and from Marysville, Mukilteo, Lynnwood, Edmonds, Shoreline, Redmond, Issaquah, Kirkland, Renton, and Tacoma.

U-PASS

The U-PASS is a public transit pass that allows unlimited rides on King County Metro, Community Transit, Pierce Transit, Kitsap Transit, Everett Transit, and Sound Transit to eligible UW students, faculty, and staff. This pass can also be used for the Sounder commuter train, Link Light Rail, paratransit services, King County Water Taxi, and the Seattle Streetcar. When the program began in 1992, the U-Pass was an optional purchase, which allowed students who did not need public transit on a daily basis to opt out. Starting in fall 2011, the policy changed to a universal U-PASS which required every full time student to purchase the bus pass. Between 2010 and 2012, the transit mode share by UW students has increased by 2%.[3]

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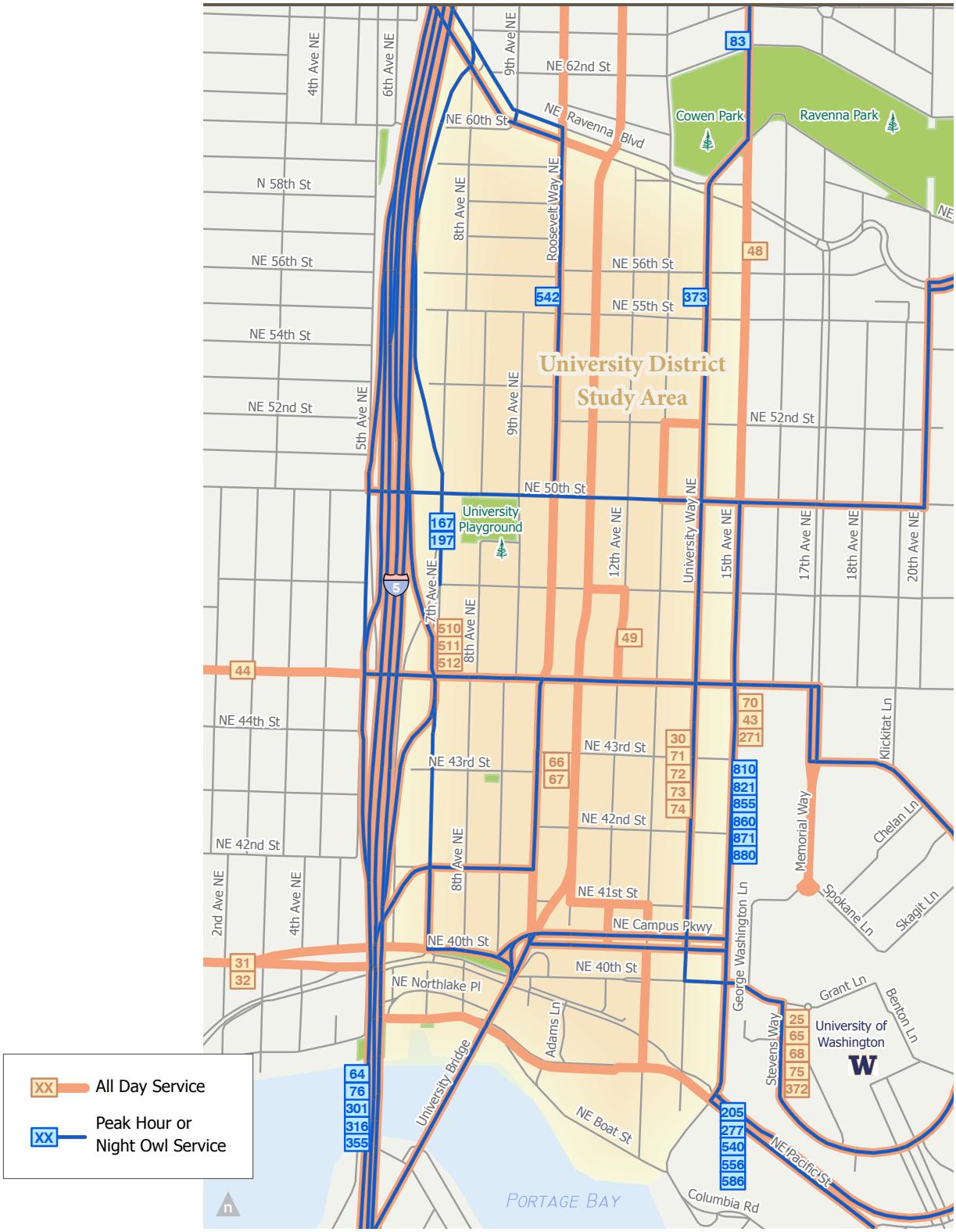
2 Data was collected in Fall 2009

3 2011 and 2013 University of Washington Master Plan Annual Reports.

Figure 3.5–4: **Existing Transit Routes**



Source: King County Metro, Sound Transit, Community Transit, 2013

Table 3.5–2: **Transit Routes In The U District**

Route	Route description	AM Peak Headway 6–9AM	PM Peak Headway 3–6PM	Off-Peak Headway
Service throughout the day				
25	Downtown Seattle/ Laurelhurst	60	60	60
43	Downtown Seattle/ Capitol Hill	10-15	10-15	15
44	Ballard, Montlake Station	10-15	10-15	10-15
48, 48X	Mt Baker TC/Loyal Heights	5-10	10	15
31, 32	Queen Anne, U District	8-16	8-16	15
30	Sandpoint, U District	30	30	30
71, 71X	Wedgewood, Downtown Seattle	30	30	30
72, 72X	Lake City, Downtown Seattle	30	30	30
73, 73X	Jackson Park, Downtown Seattle	7-15	30	7-30
49	U District, Broadway	7-15	7-15	15
66, 67	Northgate, U District	5-15	10-15	15
68[1]	Northgate, University Village	15-30	20-30	30
70	U District, Fairview	15	10	15
65[1]	Lake City, Wedgewood	15-30	15-30	30
75	Northgate, Lake City	15	15	30
372[1]	Woodinville P&R, Kenmore P&R, U District[3]	7-15	10-15	30
271[1]	Issaquah, Eastgate P&R, U District[3]	8-10	8-10	15
510	Everett, Seattle	10-15	10-15	30
511	Ash Way, Seattle	10-15	10-15	15
512	Everett, Seattle	30	30	30
Service during peak hours only				
540	Kirkland, U District	15-25	15-25	-
542	Redmond, Green Lake	15	15	-
556	Issaquah, Northgate	30	30	-
Service in peak direction only				
167[1]	S Renton P&R, U District	30	30	-
197[1]	Twin Lakes P&R, U District	25-30	30	-
205	Mercer Island, U District	40-75	110	-
277	Juanita, Houghton P&R	30	30	-
586	Tacoma, University	15-30	30	-
880	Mukilteo, U District	12-20	15-30	-
821	Cedar & Grove P&R, U District	20-30	30-60	-
355	Shoreline, Downtown Seattle	15	15-30	-
301	Aurora Village, Downtown Seattle	30	30	-
74X	Sandpoint, Downtown Seattle	30	20-30	-
Service in peak direction with some off-peak outbound trips				
373[1]	Aurora Village, U District	15-30	15-30	60
855	Lynnwood TC, U District	15-30	25-40	55-60
860	McCollum Park P&R, U District	15-20	15-25	60
871	Edmonds P&R, U District	15-25	15-25	60
810	McCollum Park P&R, U District	30	-	30
Night owl service only				
83	Downtown Seattle, Maple Leaf[4]	-	-	75

Headway

The number of minutes between bus arrivals.

Notes

1. Reduced service when University of Washington is not in session
2. Limited trips from Woodinville
3. Limited trips from Issaquah
4. Two trips only

Sources: King County Metro, 2013, Sound Transit, 2013 & Community Transit, 2013

Shuttle Services

In addition to public transit routes, UW and several medical research centers in South Lake Union operate shuttle services. These shuttles generally stop near NE Campus Parkway and Brooklyn Avenue NE. Hospital and medical research shuttles are utilized by patients and their families, employees, and staff. UW operated shuttles also allow UW faculty, staff, and students on board. The shuttle services are described below:

- The UW Health Science Express operates on weekdays between UW Medical Center and Harborview Medical Center via I–5. Shuttles operate approximately every 15 minutes from 6:00 AM to 6:15 PM.
- The UW South Lake Union Shuttle operates on weekdays between UW Medical Center to Fred Hutchinson Cancer Research Center and South Lake Union via Eastlake Avenue N. Shuttles operates on weekdays every 20 minutes from 6:40 AM to 7:00 PM.
- Dial-A-Ride is a UW operated shuttle for UW faculty, staff, and students with mobility limitations to access various stops on the UW Campus. Rides are reserved in advance and are available on weekdays every 20 minutes between 7:30 AM to 4:00 PM.
- NightRide is a UW operated shuttle service for U-PASS members that operate on weeknights from 8:00 PM to 1:30 AM. Shuttles pick up passengers from six stops on campus, and drop passengers off at requested locations within the designated zones approximately one mile from campus.

Rideshare Programs

Car2Go

Additional transportation services include rideshare programs like ZimRide. ZimRide allows UW students to connect with other UW affiliated travelers with the same destination and can share the cost of gas. Zipcar and Car2Go are also available in the U District. These services provide members with short and long-term rental vehicles that can be picked up and returned at various locations within the study area. By providing access to a vehicle on an as-needed basis, these programs allow some travelers to forego owning a personal vehicle.

EXISTING ROADWAY NETWORK

The study area is bounded by I–5 to the west, by the UW campus to the east, and by Portage Bay to the south. The local street network is made up of a combination of one-way and two-way streets that serve all travel modes.

Arterial streets have speed limits of 30 miles per hour (MPH), and local residential streets have speed limits of 25 MPH unless otherwise posted.[4]

Regional Access

I–5 is a north/south freeway that serves both local and regional traffic. I–5 experiences congestion during a substantial portion of the day since it links key activity centers and is one of only six crossings of the Ship Canal. The study area can be accessed from mainline I–5 at NE Ravenna Blvd, NE 50th Street, and NE 45th Street. Reversible lanes on I–5 also have ramps at NE Ravenna Boulevard and NE 42nd Street.

SR 520 is an east-west highway located south of the study area. The highway connects communities on the east side of Lake Washington to the U District. Travelers from SR 520 generally use the Montlake Bridge to reach the U District from the southeast.

Arterial and Local Access

The study area is accessible from the west side of I–5 at NE Ravenna Boulevard, NE 50th Street, NE 45th Street, NE 40th Street, and NE Pacific Street. To the east, the UW campus limits auto access south of NE 45th Street to NE Pacific Street and Grant Lane (which passes through the UW Campus). However, pedestrian and bicycle access is provided along numerous campus paths. North of the UW campus, auto traffic accesses the study area primarily via the principal arterials of NE 45th Street and NE Ravenna Boulevard, with smaller collector connections at NE 50th Street, and local roads at NE 47th, NE 52nd, NE 55th, and NE 56th Streets. From the north, access is primarily provided by the principal arterial couplet of Roosevelt Way NE and 11th Avenue NE, and the minor arterial 15th Avenue NE. From the south, direct access into the study area is available only by crossing the University Bridge, which continues as Eastlake Avenue NE to the south and the Roosevelt Way NE and 11th Avenue NE couplet to the north. The I–5 Ship Canal Bridge to the west of the study area and the Montlake Bridge to the east of the study area also provide connections to the south.

Functional Classification of Streets

The City of Seattle's street functional classification, including roadways designated as major truck streets, is shown in Figure 3.5–5. Descriptions of

4 *Frequently Asked Questions-Traffic Operations, SDOT, 2013. www.seattle.gov/transportation/sdotfaqs.htm#nto*

principal arterials, minor arterials, and collector arterials in the study area are provided below. Figure 3.5–7 illustrates the existing on-street parking facilities. Refer to Appendix D for a tabulated summary of the parking facilities.

Arterial Classification Defintions

Principal Arterials: roadways that are intended to serve as the primary routes for moving traffic through the city connecting urban centers and urban villages to one another, or to the regional transportation network.

Minor Arterials: roadways that distribute traffic from principal arterials to collector arterials and access streets.

Collector Arterials: roadways that distribute traffic from principal arterials to collector arterials and access streets.

Source: Seattle Comprehensive Plan – Transportation Element, City of Seattle, 2005

NORTH-SOUTH CORRIDORS The following corridors run north-south in the study area and have been listed from the west side to the east side of the study area.

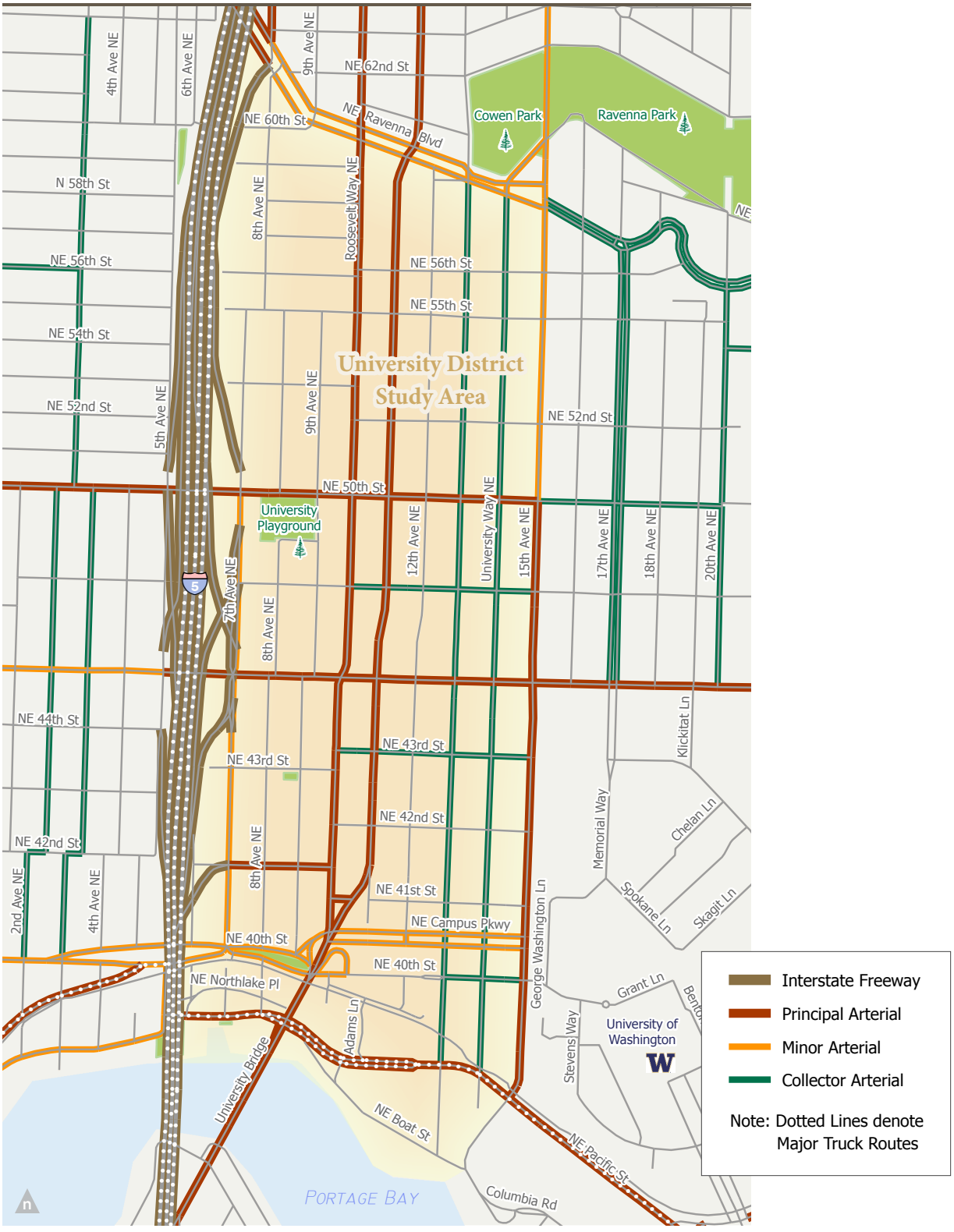
Roosevelt Way NE is a principal arterial. It is a one-way street with two southbound travel lanes and a bicycle lane. Together with 11th Avenue NE, Roosevelt Way NE forms a one-way couplet. Approaching NE 45th Street, the parking lane ends to accommodate a right turn lane. Signalized intersections include NE 42nd Street, NE 45th Street, NE 47th Street, NE 50th Street and Ravenna Boulevard. Local street intersections are side-street stop controlled. Curb parking is available on both sides of the street for most of the corridor. South of NE 50th Street paid parking is $1.50 per hour with a 4-hour maximum from 8 AM to 8 PM. There is unpaid two-hour time limited parking between NE 50th Street and NE 55th Street, and unpaid one-hour time limited parking near NE Ravenna Boulevard between 7 AM to 6 PM.

Mixed use buildings with retail on the bottom floor and apartments above are found south of NE 42nd Street on both sides of the road. North of NE 53rd Street, the land use is primarily small businesses with a mix of single family homes that line both sides of the street towards Ravenna Boulevard.

11th Avenue NE is a one-way principal arterial with two northbound lanes and a bicycle lane. Signalized intersections are located at NE 42nd Street, NE 43rd Street, NE 45th Street, NE 47th Street, NE 50th Street, and NE Ravenna Boulevard. Intersections with local streets are side-street stop controlled. Parking is available on both sides of street and there are generally no restrictions from the south end of the study area to NE 43rd Street. Paid parking is provided at an hourly rate of $1.50 for up to four hours maximum from NE 43rd Street to NE 50th Street. North of NE 50th Street, there is unpaid two-hour time restricted parking from 7 AM to 6 PM except for Residential Zone Permit parking on both sides of the street. Left and right turn lanes are provided at NE 45th Street.

From the south, the corridor is mostly comprised of apartment buildings or mixed use buildings with retail on the ground floor and apartments above. North of NE 50th Street, the street becomes mostly residential.

Figure 3.5–5:
Existing Roadway Functional Classification and Major Truck Streets



Source: City of Seattle, 2003

The Ave

University Way NE, also known as "The Ave," is a collector arterial with one lane in each direction, with paid parking generally on both sides of the road. There is a bicycle climbing lane from NE Pacific Street to NE 41st Street and NE 50th Street to Ravenna Boulevard. Sharrows are provided between these two segments in the downhill direction. University Way NE is signalized at all intersections except NE 41st Street, 52nd Street, 55th Street and NE Ravenna Boulevard. Paid parking is available on both sides of the street south of NE 50th Street for an hourly rate of $2.00 for up to two hours between 8 AM to 8 PM—unpaid parking is available with a two-hour time limit north of NE 50th Street. This corridor is heavily travelled by pedestrians and transit and includes small-scale restaurants and retail.

15th Avenue NE is a principal arterial south of NE 50th Street and a minor arterial north of NE 50th Street. Left turn pockets are provided at the signalized intersections of NE 40th Street, NE Campus Parkway, NE 41st Street, NE 42nd Street and NE 45th Street. Signals are also present at NE 43rd Street, NE 47th Street and NE 50th Street. All other local street intersections are side-street stop controlled. North of NE 45th Street during peak hours, 15th Avenue NE is two lanes of traffic in the peak direction and one traffic lane and one parking lane in the off-peak direction. During off-peak hours, there is one lane of traffic and one lane of parking in each direction. North of NE 50th Street, unpaid parking is available in the off-peak direction during peak hours, and on both sides of the street during off-peak hours. Between NE 45th Street and NE 50th Street, paid parking is available at an hourly rate of $1.50 for up to four hours in the off-peak direction only. South of NE 45th Street, 15th Avenue NE has two travel lanes in each direction. Paid parking is available south of NE 40th Street on the west side of the street at an hourly rate of $2.00 for two hours (or three hours after 5 PM) from 8 AM to 8 PM. Similar parking is available at limited locations between NE 42nd Street and NE 45th Street with the restriction of no parking during peak hours. Businesses and UW facilities line the roadway south of NE 50th Street, while the roadway transitions to a residential character north of NE 50th Street.

EAST-WEST CORRIDORS The following corridors run east-west in the study area and are listed from the north side to south side of the study area.

NE Ravenna Boulevard is a minor arterial at the north end of the study area. It is one lane in each direction with a parking lane on each side. There is a wide landscaped median with bike lanes between the median and travel lanes in both directions from I-5 to 11th Avenue NE. NE Ravenna Boulevard is signalized at Roosevelt Way NE and 12th Avenue NE, with an all-way stop

at 15th Avenue NE. Parking is either unrestricted or has a two hour time limit from 7 AM to 6 PM except for Restricted Zone Parking Permits. The land use is generally single family homes or apartments.

NE 50th Street is a principal arterial with access to I–5 at the western edge of the study area. It has two through lanes in each direction with signalized intersections at 7th Avenue NE, 9th Avenue NE, Roosevelt Way NE, 11th Avenue NE, Brooklyn Avenue NE, University Way NE, and 15th Avenue NE. There are no left turn pockets along this street within the study area. There is no parking along this corridor within the study area. Generally the corridor has residential homes and parks from west of 9th Avenue NE and transitions to restaurants, stores, movie theaters, and apartment buildings east of 9th Avenue NE.

NE 45th Street is a principal arterial with access to I–5. It is two lanes in each direction, with a two-way center turn lane from I–5 to Roosevelt Way NE. From Roosevelt Way NE to NE 15th Street, left turn pockets are provided. There are sharrows from I–5 to 15th Avenue NE. Signalized intersections include 7th Avenue NE, Roosevelt Way NE, 11th Avenue NE, 12th Avenue NE, Brooklyn Avenue NE, University Way NE, and 15th Avenue NE. There is no on street parking on this corridor. This commercial thoroughfare includes retail, restaurants, and mixed use buildings for the length of the corridor.

NE Campus Parkway is a minor arterial with two travel lanes in each direction paid on street parking on both sides of the roadway, and a wide landscaped median. Campus Parkway NE is signalized at Brooklyn Avenue NE, University Way NE, and 15th Avenue NE. UW housing and facilities line the roadway which is a key transit route, linking buses from I–5 and the University Bridge to the UW campus and University Way NE. On-street paid parking is available west of 12th Avenue NE at an hourly rate of $1.50 for up to four hours and east of University Way NE at an hourly rate of $2.00 for two hours (or three hours after 5 PM) from 8 AM to 8 PM.

NE Pacific Street is a principal arterial running east-west along the southern end of the study area. From the University Bridge to Brooklyn Avenue NE, NE Pacific Street has one travel lane and one bicycle lane in each direction with a center landscaped median. Approaching Brooklyn Avenue NE, NE Pacific Street widens to two lanes in each direction, with left turn pockets. It is signalized at 11th Avenue NE, Brooklyn Avenue NE, University Way NE, and 15th Avenue NE. NE Pacific Street provides a key connection from the study area to the Montlake Bridge to the east. Unpaid one or two hour time limited parking is available west of 8th Avenue NE. Land uses along the

corridor include businesses, restaurants, boat storage, and UW housing. The University of Washington Medical Center is located on NE Pacific Street east of the study area.

Major Truck Streets

Designated major truck streets are primary routes for goods movement throughout the city and between major freight trip producers such as the Ballard Interbay Northend Manufacturing & Industrial Center to the west of the U District. Designation as a major truck street helps the SDOT determine street design, traffic management plans, and pavement improvement projects that allow and facilitate the movement and more frequent use of larger vehicles along the designated street. Within the study area, I–5 and NE Pacific Street are identified as major truck streets.

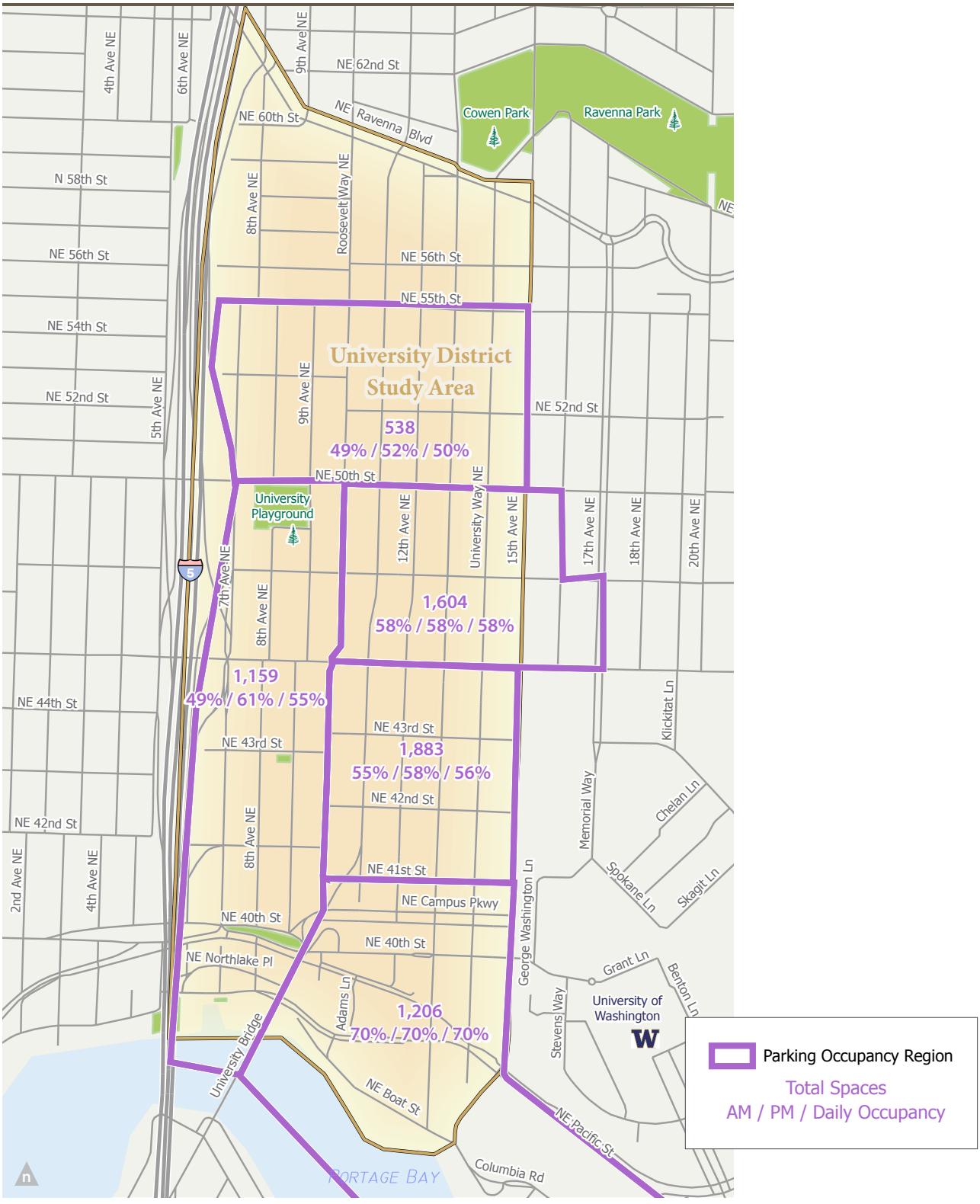
PARKING

UW parking garage

Off-street parking data was collected for the 2010 Puget Sound Regional Council (PSRC) Parking Survey. The Parking Survey covered the portion of the study area south of NE 55th Street and surveyed 212 public and private pay lots. The AM occupancy rate is based on parking data collected from 8:30 AM to 11:30 AM, and the PM occupancy rate is based on parking data collected from 1:30 PM to 3:30 PM. The average occupancy rate is the average of the AM and PM parking occupancy, respectively, for each peak period. Daily occupancy is the average of the AM and PM parking occupancy. The total number of parking stalls and the average AM, PM and daily occupancy rates are provided in Figure 3.5–6. Parking utilization tends to be highest in the southern portion of the study area where UW academic buildings and parking garages are concentrated. Off-street parking utilization (as well as supply) is lower in the more residential areas north of NE 50th Street.

Figure 3.5–7 summarizes the on-street parking within the study area, which was collected by SDOT in 2013. On-street parking provisions vary widely within the study area: facilities include paid parking from 8 AM to 8 PM, one or two hour time limited parking during business hours (7 AM to 6 PM), time limited street parking where Restricted Parking Zone (RPZ) permits are exempt, peak hour and peak direction restricted parking, unrestricted parking, and no parking areas. RPZ permits can be purchased by eligible residents who live within a restricted parking zone. Permit holders may park for time lengths longer than the signed limits for non-RPZ vehicles, or are able to park during specified hours of the day when public parking is

Figure 3.5–6:
Existing Off-Street Parking Supply and Occupancy



Source: PSRC Parking Inventory, 2010

Figure 3.5–7: **Existing On-Street Parking Facilities**

Source: SDOT, 2013

restricted. Much of the study area north of NE 50th Street is an RPZ, as well as the area between NE 45th Street and NE 50th Street west of Roosevelt Way.

The City of Seattle Paid Parking Report (2013) summarizes parking rates within the U District south of NE 50th Street between Roosevelt Way NE and 15th Avenue NE. The study area is split into two areas: the U District Core (south of NE 50th Street and generally within two blocks of University Way NE and on NE Boat Street), and the U District Periphery (south of NE 50th Street and generally comprised of the area west of the U District Core to Roosevelt Way NE). The U District Core has rates of $2.00 per hour with a two hour time limit (or three hours after 5 PM). The Periphery has rates of $1.50 per hour with four hour time limits. Paid parking is required from 8 AM to 8 PM Monday through Saturday except for government holidays

The parking utilization measured in this report is the three-hour Daytime Peak Occupancy (weighted average of the three highest parking occupancies between 8 AM and 3 PM), and the occupancy at 7 PM when some time limited parking restrictions have ended. SDOT's target range is parking occupancies between 70 and 85%. Results show that in 2013 the U District Core had a three-hour Daytime Peak Occupancy of 76% and 107% at 7 PM. In the District Periphery, the three-hour Daytime Peak Occupancy was 57% and 52% at 7 PM. This shows on-street paid parking in the U District Core during the daytime is within SDOT's target range of 70 to 85%; however, demand exceeds the target range, as well as the supply during the evening hours. On-street paid parking is available in the Periphery where both the daytime and the evening occupancy are below the target range.

Pay parking station

SDOT commissioned a study in October 2010 to evaluate the current parking facilities and parking demand in the U District, south of NE 55th Street between Roosevelt Way NE and 15th Avenue NE. Evaluation was based on hourly data collection of the percent utilization of each block face, parking duration, and parking compliance to restrictions such as time limits or no parking zones.

The study found that compliance was 75% or greater for time limited parking, except for the Boat Street Triangle which has two hour time limited parking and had a compliance rate of 62%. Approximately one-third of unrestricted parking spaces had vehicles that parked for 10 or more hours, and utilization over 100% was found on streets with unrestricted parking segments south of NE 55th Street on 11th Avenue NE, 12th Avenue NE, Roosevelt Way NE, Brooklyn Avenue NE and NE 42nd Street.

Relevant Studies

SEATTLE COMPREHENSIVE PLAN (2005)

The Seattle Comprehensive Plan provides guidance on the City's development to support future growth. The Plan identifies four core values: Community, Environmental Stewardship, Economic Opportunity and Security, and Social Equity.

Urban Village Element

See Section 3.1.5 for additional discussion of the Comprehensive Plan.

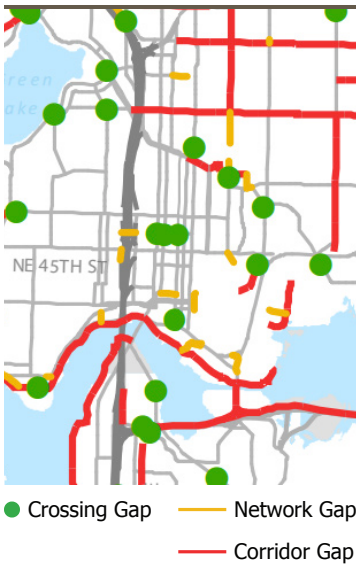
The urban village element of the Comprehensive Plan provides guidance on locations to direct future population growth to create sustainable neighborhoods in Seattle. The U District is categorized as an Urban Center with mixed residential and employment and contains the University District Northwest urban village. Goals include development of diverse housing and employment, pedestrian/transit-oriented communities, providing services and infrastructure to support growth, and promoting the natural environment.

Transportation Element

The transportation element of the Comprehensive Plan provides guidance for transportation planning and development to support future growth. Goals include making transportation decisions that support land use and the urban village strategy, increasing transportation options such as transit, bicycling, and walking, moving people and goods efficiently, and improving the environment by encouraging transportation modes other than single-occupant vehicles (SOV). A 2020 non-SOV mode split goal was set for Seattle's Urban Centers; the U-District has a goal of 70% non-SOV trips for both work trips and all types of trips.

Additionally, the Complete Streets Ordinance passed in 2007 directs arterial street design to consider the safety of all mode users including pedestrians, bicyclists, and transit riders, while efficiently moving people and goods.

Figure 3.5–8:
Gaps in the Bicycle Network



Source: Seattle Bicycle Master Plan, City of Seattle, 2013

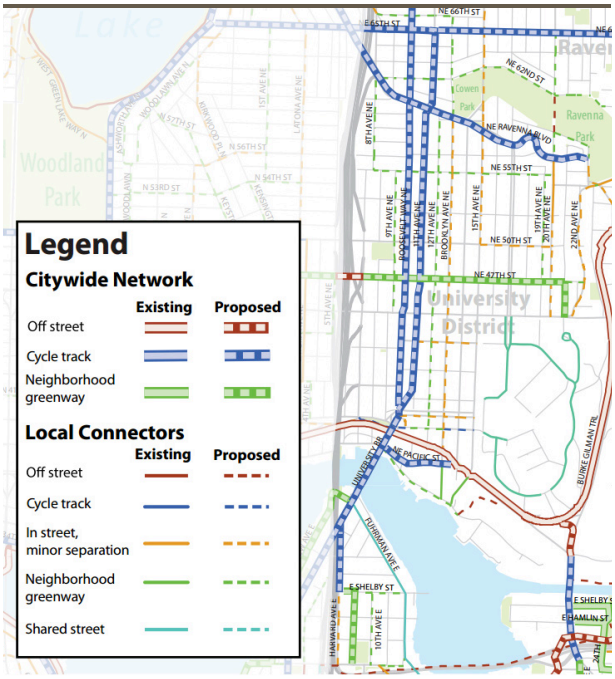
SEATTLE BICYCLE MASTER PLAN (DRAFT, JUNE 2013)

This document provides guidance on the future investments in bicycle facilities in Seattle, with a vision for bicycling as a safe and convenient mode for people of all ages and abilities on a daily basis. Goals include increase bicycle ridership, safety, connectivity, equity, and livability.

Specific gaps in the bicycle network within the study area identified in this document include crossing gaps at several intersections with NE 47th Street, and at the intersection of Brooklyn Avenue NE and NE Pacific Street. Network gaps less than one quarter of a mile are identified at NE 47th Street over I-5, NE 41st Street between Brooklyn Avenue NE and 12th Avenue NE, and 15th Avenue NE near NE Campus Parkway. Corridor Gaps are gaps longer than one quarter of a mile; the Bicycle Master Plan identifies a corridor gap along the waterfront south of the Burke-Gilman Trail on NE Columbia Road, NE Boat Street, and NE Northlake Way from the UW to west of Gasworks Park. (See Figure 3.5–8.)

Proposed projects in the area include cycle tracks on Roosevelt Way NE, 11th Avenue NE, NE Ravenna Boulevard, NE 40th Street, and NE Pacific Street. In-street separated bicycle facilities are proposed along Brooklyn Avenue NE, 15th Avenue NE north of NE 50th Street, NE 43rd Street, and NE Campus Parkway. Neighborhood greenways are proposed on 8th Avenue NE north of NE 55th Street, 9th Avenue NE from NE 47th Street to NE 55th Street, 12th Avenue NE, NE Boat Street, NE 47th Street and NE 55th Street. The BMP includes a map of these improvements as shown in Figure 3.5–9.

Figure 3.5–9:
Proposed Bicycle Improvements in the U District



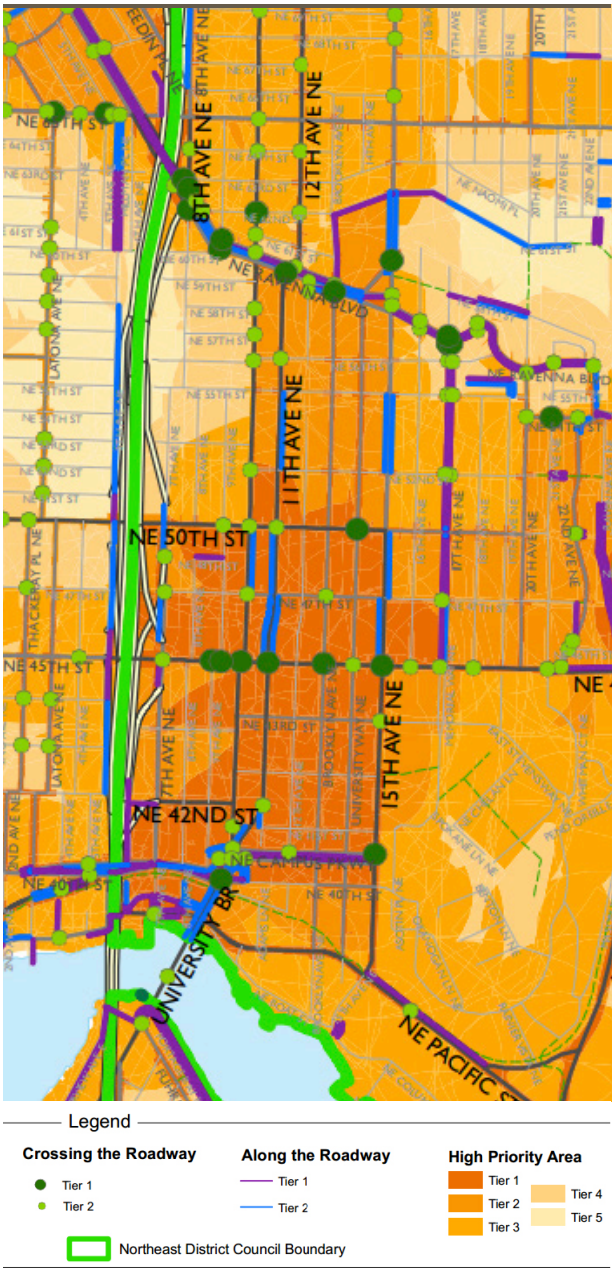
Source: Seattle Bicycle Master Plan, City of Seattle, 2013

SEATTLE PEDESTRIAN MASTER PLAN (2009)

The Pedestrian Master Plan has a mission to "make Seattle the most walkable city in the nation." Goals include reducing the number of crashes involving pedestrians, providing services equitably, cultivating vibrant environments, and improving health in communities. Figure 3.5–10 is a map from the Pedestrian Master Plan that identifies pedestrian comfort level as they travel within the network, and where improvements are needed. The darker purple segments are Tier 1 locations with the highest discomfort for pedestrian travel. Criteria for evaluation include presence of sidewalks, sidewalk buffers (such as parked cars or landscaping), traffic volumes, and traffic speeds. Tier 1 segments within the study area include NE Campus Parkway, NE 40th Street near the University Bridge, and NE Northlake Way. Other locations are closer to I-5 and freeway ramps such as Pasadena Place NE and NE 42nd Street.

Figure 3.5–10 also identifies areas that need crossing improvements. The dark green dots are Tier 1 locations where improvements are most needed. Criteria for evaluation include presence of ADA ramps, presence of traffic signals, roadway width, and traffic volumes. Within the study area crossing improvements are needed near the north end of the University Bridge, east-west along NE 45th Street and NE Ravenna Boulevard, and at the intersections of NE Campus Parkway/15th Avenue NE and NE 50th Street/University Way NE.

Figure 3.5–10: **Pedestrian High Priority Areas**



Note: The Northeast District Council is one of the City's 13 Neighborhood Councils (citizen-led advisory groups).

Source: Northeast District Council High Priority Projects, SDOT, 2008

CITY OF SEATTLE RIGHT-OF-WAY IMPROVEMENTS MANUAL—GREEN STREETS

Green streets are local roads that prioritize pedestrians and open space over through vehicle traffic. This includes installing facilities such as wider sidewalks, inviting landscaping to attract pedestrians, and traffic calming for reduced vehicle volumes and slower speeds.[5] Typical characteristics of green streets include connections to major transit facilities and light rail stations. In the study area, Brooklyn Avenue NE, NE 43rd Street and NE 42nd Street are designated as Green Streets.

FREIGHT MOBILITY STRATEGIC ACTION PLAN (2005)

This document was created by the Seattle Department of Transportation to protect and promote industrial jobs in Seattle. The two manufacturing and industrial centers in Seattle are the Greater Duwamish Manufacturing and Industrial Center and the Ballard/Interbay/Northend Manufacturing and Industrial Center. Relevant points related to the project area include the designation of NE Pacific Street as a major truck route in an effort to reduce conflicts between modes. In addition retail and businesses in the area are to work together to consolidate and designate truck and commercial loading zones, as well as encourage smaller trucks if necessary.

5 *Seattle ROW Improvements Manual, Chapter 6—Streetscape Design Guidelines. City of Seattle. www.seattle.gov/transportation/rowmanual/manual/6_2.asp*

SEATTLE TRANSIT MASTER PLAN (2012)

This document provides guidance for future transit investments. The City of Seattle has designated 15th Avenue NE and NE 45th Street as priority bus corridors, which means that the City prioritizes transit investments for increased speed and reliability along these corridors.

The TMP updates the U-Line streetcar concept presented in the Seattle Streetcar Network Development Report (2008), which envisioned an extension of the South Lake Union streetcar along Eastlake Avenue E to the U District. The TMP recommends high capacity transit (e.g., rapid streetcar or BRT) from South Lake Union to the U District that runs along the Roosevelt Way NE/11th–12th Avenue NE couplet. The TMP states that funding is needed for detailed study of right-of-way evaluations as well as to confirm the preferred mode of transit.

AGREEMENT BETWEEN KING COUNTY AND THE CITY OF SEATTLE (1999)

King County Metro and the City of Seattle agreed that it was beneficial to have layover and bus parking in the U District as King County Metro operates regular and special public transportation to, from, and within the University of Washington and the U District area. This document describes the 15 bus layover zones within the U District. The zones include locations along Brooklyn Avenue NE, 12th Avenue NE, 47th Avenue NE, 7th Avenue NE, NE Campus Parkway, University Way NE, NE Pacific Place, NE 47th Street, 15th Avenue NE, and NE Pacific Street. All zones are within public street right-of-way. The zone on 7th Avenue NE between NE 45th Street and NE 47th Street is limited during the PM commute, and will no longer be used once light rail reaches the U District.

NW MARKET STREET/NE 45TH STREET TRANSIT PRIORITY CORRIDOR IMPROVEMENT PROJECT (2010)

This document evaluated projects to increase the speed and reliability of King County Metro Route 44 through the Ballard, Phinney, Wallingford, U District, and Montlake neighborhoods. Corridors within the study area included NE 45th Street, 15th Avenue NE, and NE Pacific Street. Proposed improvement projects within the study area include restriping NE 45th Street between 7th Avenue NE and University Way NE to four lanes with

left turns prohibited, bus stop consolidation, bus bulbs, and transit signal priority treatment at key intersections.

UNIVERSITY DISTRICT STRATEGIC PLAN (2013)

The University District Strategic Plan document was created by the U District Livability Partnership (a coalition of stakeholders such as local business owners, volunteers, residents and sponsors), in collaboration with City departments, to help direct development of the U District. The vision is for a "vibrant and innovative district of entrepreneurs, major employers, talented workers and diverse residents." Principles include encouraging community involvement, and attracting and encouraging a diverse retail mix on University Way NE that is also supportive of small businesses. Goals include creating a clean and safe environment while marketing the U District as an arts and entertainment center that is also a 24/7 major transportation hub.

U DISTRICT URBAN DESIGN FRAMEWORK (2013)

The U District Urban Design Framework (UDF) was developed through a collaboration between the UDLP, other community groups, the Seattle Department of Planning and Development, the Office of Economic Development and the Department of Transportation. The UDF is intended to guide development in the area as changes are expected with the new Sound Transit Link light rail station at Brooklyn Avenue NE and NE 43rd Street. Guiding principles related to transportation include having new development around the Sound Transit station, having a street network with public spaces, and improving non-motorized transportation facilities while supporting transit and autos.

It was also noted that there are complaints about the poor east-west street network connectivity as well as the pedestrian and bicycle facilities north of the University Bridge. In addition, Brooklyn Avenue NE, NE 42nd Street, and NE 43rd Street are designated as Green Streets. There is a proposed Neighborhood Greenway on 12th Avenue NE as well, which would prioritize pedestrians and bicyclists over vehicle traffic.

UNIVERSITY OF WASHINGTON CAMPUS MASTER PLAN (2003)

The University of Washington Campus Master Plan (CMP) was created in 2003 to guide the development of approximately three million gross square feet of projected growth while maintaining the values of the University.

The transportation management section of the plan limits the number of vehicle trips to and from the U District and the Campus during peak hours. Estimates of travel patterns are determined from surveys of UW faculty, staff, and students. The 2012 vehicle trip estimates are summarized in Table 3.5–3; the 2012 vehicle trips are below the set caps.

Table 3.5–3: **2012 Vehicle Trips to and from the University of Washington**

	AM Peak Inbound to U District	AM Peak Inbound to Campus	PM Peak Outbound from U District	PM Peak Outbound from Campus
CMP Cap	10,020	7,877	10,481	8,488
2012 Vehicle Trip Estimates	8,168	5,790	8,774	6,263
Percentage Under CMP Cap	-18%	-26%	-16%	-26%

Source: University of Washington Campus Master Plan—Annual Report, 2013

From 2001 to 2012, the campus has experienced a 13% total population growth, but vehicle trips have decreased by 32%. The mode split estimates for UW faculty, staff, and students were also provided for 2012, as shown in Table 3.5–4. Transit and walking trips make up 45% and 35% of student trips, respectively, while driving alone accounts for 8%. Faculty and staff have higher drive alone trips at 45% and 35%, respectively, while transit is the second most popular mode at 23% and 42%, respectively.

Table 3.5–4: **2012 Mode Share Split for University of Washington Faculty, Staff, and Students**

Mode	Faculty	Staff	Students
Transit	23%	42%	45%
Drive Alone	45%	35%	8%
Carpool/Vanpool	7%	11%	4%
Bicycle	16%	7%	8%
Walk	7%	4%	35%
Other	1%	1%	1%

Source: University of Washington Campus Master Plan —Annual Report, 2013

UNIVERSITY AREA TRANSPORTATION ACTION STRATEGY—EXISTING CONDITIONS SUMMARY (2008)

This document is an update to the University Area Transportation Study completed in 2002. Expected changes to the area such as the three Sound Transit Stations at Husky Stadium, Brooklyn Avenue NE and NE 43rd St, and Roosevelt Way NE and NE 65th Street required a review and update to the 2002 study. The existing conditions section found for the last 16 years the traffic volumes had remained relatively steady or decreased in the area. In general, sidewalks met the minimum six feet width standard in the City's Right-of-Way Improvement Manual. Many pedestrian facilities however did

not meet the total minimum distance standards between moving traffic and pedestrians, (includes sidewalk, parking lane, planter strips and bicycle lane), which varies by arterial classification. It was noted that there are locations with conflicts between the high number of turning vehicles and crossing pedestrians, and that pedestrians experience long delays due to cycle lengths at certain intersections.

The bicycling facilities were evaluated based on traffic conditions (such as daily volumes, speed limits, heavy truck percentages and on-street parking), as well as roadway design (number of lanes, presences of roadway shoulders, and width of outside lanes). More than half of the bicycle facilities did not meet the level of service thresholds set for bicycle facilities. Locations most in need of improvements within the study area were identified as NE 45th Street from I-5 to NE 17th Avenue, and NE 50th Street across I-5.

SOUND TRANSIT DOCUMENTS

The North Link Extension consists of the planned light rail route from the University of Washington Station near Husky Stadium to Northgate. Three stations will be constructed: the U District Station at Brooklyn Avenue NE and NE 43rd St, Roosevelt Station at Roosevelt Way NE and NE 65th St, and the Northgate Station near the Northgate Transit Center. This light rail extension will be entirely underground until just north of NE 95th Street. The expected completion date for this segment is 2021.

The U District Station is the only station within the study area, and will be approximately 80 feet below ground with a north entrance near Neptune Theater and a south end entrance on NE 43rd Street. Plans for the redesign of Brooklyn Avenue NE as a Green Street near the station will include curb parking on the southbound direction, one lane of traffic in each direction, and a bike lane in the northbound direction. Sharrows will be painted in the southbound lane.[6]

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6 *North Link—Brooklyn Station 50% Design Open House, Sound Transit (5/23/2012). www.soundtransit.org/Documents/pdf/projects/link/north/brooklyn/20120523Brooklyn60DesignPresentation.pdf*

Analysis Methodology—Affected Environment

This section describes the methodology used to analyze the existing transportation conditions within the study area.

AUTO, FREIGHT, AND TRANSIT

The proposed actions being evaluated in this document are area-wide and programmatic in nature, rather than location specific. Therefore, the methodology used to evaluate the transportation network is broad-based as is typical for the analysis of larger scale zoning or comprehensive planning efforts, rather than an intersection-level analysis that may be more appropriate for assessing the effects of development on individual parcels or blocks.

This study evaluates the transportation system on a corridor-wide basis to present a holistic view of the network. Specifically, auto and transit travel time along the study corridors is assessed. Travel time was selected as the performance measure because it is easily relatable and addresses the fundamental concern of most travelers—how long does it take to move within and through the study area?

To assess existing conditions, PM peak period travel times were collected in October 2013. The change in travel time predicted by the City of Seattle travel demand forecasting model was used to factor the 2013 data to represent the base year of 2015. For the purposes of this study, the quality of freight mobility within the U District is also assessed using travel time. However, it is acknowledged that traffic congestion is more difficult for freight to navigate, and trucks typically travel at slower speeds than general auto traffic.

Level of Service

A concept used to describe traffic operations. Facilities are assigned a letter grade with A representing free-flow conditions and F representing severe congestion.

Level of Service (LOS) is a concept used to describe traffic operations by assigning a letter grade of A through F, where A represents free-flow conditions and F represents highly congested conditions. This study uses concepts from the 2010 Highway Capacity Manual (HCM) to define thresholds for each LOS threshold, which are shown in Table 3.5–5. Additional details may be found in Appendix D.

Table 3.5–5: **LOS Thresholds for Travel Speeds and Travel Time**

	LOS	A	B	C	D	E	F
Travel Time Thresholds — Ratio between PM Peak Hour Travel Time and Travel Time at Free-Flow Speed		<1.18	1.18 to <1.49	1.49 to <2.0	2.0 to <2.5	2.5 to <3.33	≥3.33

Source: Highway Capacity Manual 2010, Transportation Research Board

To assess the level of vehicle congestion in the vicinity of the U District, a set of study corridors were selected for auto, freight, and transit. These include nearly all of the principal arterials within the study area, as well as some of the key minor arterials. Most corridors were selected as both auto/freight and transit study corridors although some are included for only one.

Figures showing the 2015 LOS on each corridor are included in the following section. Note that the exact extents of some of the auto and transit corridors vary from each other. Auto corridor extents break at intersections, while transit corridors were chosen to mirror the auto corridors, but must break at the nearest bus stop to facilitate data collection.

PEDESTRIAN AND BICYCLE NETWORK

The pedestrian and bicycle network is assessed based on the mode share in the study area. The City's 2009 Pedestrian Master Plan and 2013 Bicycle Master Plan identified high priority areas for improvement, as shown in Figure 3.5–11.

SAFETY

High Accident Location

A signalized intersection with an average of ten or more collisions per year or an unsignalized intersection with an average of five or more collisions per year.

Previous studies for the City have evaluated intersection safety by measuring the average number of collisions per year. A High Accident Location is identified if there is:

- An average of 10 or more collisions per year at a signalized intersection; or
- An average of 5 or more collisions per year at an unsignalized intersection.

This study will also use the criteria put forth in the South Lake Union Height & Density Rezone EIS for pedestrian/bicycle intersections of interest. A pedestrian/bicycle intersection of interest is identified if either of the following criteria are met:

- Any intersection with an average of 1.7 or more pedestrian or bicycle collisions per year (which equates to five or more collisions in a three-year period),
- Or any intersection with an average of 2.3 or more pedestrian and bicycle collisions per year (which equates to seven or more collisions in a three-year period).

A Bike Share program is slated to launch in the U Distict in 2014, making bicycling a more feasible option for residents, employees, and visitors.

The first criteria treats pedestrian and bicycle collisions separately, while the second combines the two measures.

Figure 3.5–11: **High Priority Pedestrian & Bicycle Improvement Needs**

Source: Seattle BMP, 2013 / Seattle PMP, 2009

Analysis Results—Affected Environment

This section presents the results of the 2015 transportation conditions analysis. Since the analysis base year for this study is 2015, the project team forecasted 2015 conditions when possible. These forecasts take into account the development that is expected to occur between Fall 2013 and 2015.

Congestion along NE 45th Street

AUTO AND FREIGHT

Auto travel times were collected in October 2013. Modeling was completed to determine how the projects that will be developed by the 2015 base year would affect these travel times. The 2015 travel times and LOS are shown in Table 3.5–6. The LOS of the more congested direction is shown in Figure 3.5–12.[7]

Two corridors would operate at LOS F in 2015: Roosevelt Way NE and 11th Avenue NE between NE 45th Street and NE 50th Street. The poor LOS is due mainly to delay experienced at the intersections with NE 45th Street and NE 50th Street.

The travel time results indicate that traffic is most congested in the center of the U District, with more moderate conditions in the periphery. Traffic is also congested on the arterials providing access to and across I–5. While a typical PM peak hour tends to operate acceptably overall, it should be noted that events such as street closures, congestion from I–5 ramps, or closure of the University Bridge can cause substantial traffic congestion within the study area.

NE Pacific Street is the only roadway classified as a major truck street in the study area (excluding I-5, which is not part of this analysis). In the PM peak hour, eastbound travel time (i.e. leaving the study area) is longer than westbound travel time, which reflects the congestion approaching the Montlake Bridge. Congestion on this roadway segment presents a challenge for freight mobility through the area.

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7 *Segments operating at LOS A, B, and C are grouped into one color on this figure since they all represent relatively uncongested conditions*

Figure 3.5–12: **Auto and Freight Study Corridors—2015 Level of Service**

Note: LOS is shown for the direction with the longer travel time.

Table 3.5–6: **2015 PM Peak Hour Auto Travel Times**

			North + Eastbound		south + Westbound	
ID	Road	Segment	LOS	Travel Time	LOS	Travel Time
1	NE Ravenna Blvd	8th Ave NE to 15th Ave NE	E	3:13	E	3:00
2	NE 50th St	Latona Ave NE to 5th Ave NE	C	0:26	E	0:51
3	NE 50th St	5th Ave NE to Roosevelt Way NE	B	0:59	C	1:24
4	NE 50th St	Roosevelt Way NE to 15th Ave NE	D	1:50	A	0:59
5	NE 45th St	Latona Ave NE to 5th Ave NE	E	0:31	D	0:27
6	NE 45th St	5th Ave NE to Roosevelt Way NE	E	2:01	D	1:22
7	NE 45th St	Roosevelt Way NE to 15th Ave NE	D	2:09	D	2:16
8	NE 45th St	15th Ave NE to Montlake Blvd NE	B	2:15	B	2:26
9	NE 40th St	2nd Ave NE to 9th Ave NE	D	1:43	E	2:28
10	NE Campus Pkwy	Roosevelt Way NE to 15th Ave NE	Transit Corridor Only			
11	NE Pacific St/NE Northlake Way	6th Ave NE to 15th Ave NE	D	2:56	B	1:40
12	NE Pacific St	15th Ave NE to Montlake Blvd NE	D	2:37	B	1:46
13	7th Ave NE	NE 42nd St to NE 45th St	Transit Corridor Only			
14	Roosevelt Way NE	NE Ravenna Blvd to NE 50th St	–	–	D	2:00
15	Roosevelt Way NE	NE 50th St to NE 45th St	–	–	F	2:20
16	Roosevelt Way NE	NE 45th St to NE Campus Pkwy	–	–	B	1:20
17	University Bridge	NE Campus Pkwy to Fuhrman Ave E	A	0:42	D	1:31
18	11th Ave NE	NE Ravenna Blvd to NE 50th St	C	1:36	–	–
19	11th Ave NE	NE 50th St to NE 45th St	F	2:09	–	–
20	11th Ave NE	NE 45th St to NE Campus Pkwy	E	2:38	–	–
21	University Way NE	NE Ravenna Blvd to NE 50th St	Transit Corridor Only			
22	University Way NE	NE 50th St to NE 45th St	Transit Corridor Only			
23	University Way NE	NE 45th St to NE Pacific St	Transit Corridor Only			
24	15th Ave NE	NE Ravenna Blvd to NE 50th St	C	1:21	C	1:21
25	15th Ave NE	NE 50th St to NE 45th St	D	1:19	E	1:36
26	15th Ave NE	NE 45th St to NE Pacific St	C	3:19	C	2:58

Source: Fehr & Peers, 2013

TRANSIT

Current PM peak hour transit travel times are shown in Table 3.5–7 and LOS by direction is shown in Figure 3.5–13. The travel times were collected using data from the OneBusAway Application Programming Interface (API) which collects transit arrival times to bus stops every 90 seconds. Free-flow travel times for transit were calculated separately from autos to account for the fact that transit generally operates at slower speeds, as well as the frequent stops to load and unload passengers. The transit travel times are

Figure 3.5–13: **Transit Study Corridors – 2015 Level of Service**

Table 3.5–7: **2015 PM Peak Hour Transit Travel Times**

ID	Road	Segment	North + Eastbound LOS	North + Eastbound Travel Time	south + Westbound LOS	south + Westbound Travel Time
1	NE Ravenna Blvd	8th Ave NE to 15th Ave NE	Auto Corridor Only			
2	NE 50th St	Latona Ave NE to 5th Ave NE	Auto Corridor Only			
3	NE 50th St	5th Ave NE to Roosevelt Way NE	Auto Corridor Only			
4	NE 50th St	Roosevelt Way NE to 15th Ave NE	Auto Corridor Only			
5	NE 45th St	Latona Ave NE to 5th Ave NE	B	1:41	C	1:59
6	NE 45th St	5th Ave NE to Roosevelt Way NE	E	1:45	**F**	**2:10**
7	NE 45th St	Roosevelt Way NE to 15th Ave NE	A	1:41	C	2:49
8	NE 45th St	15th Ave NE to Montlake Blvd NE	Auto Corridor Only			
9	NE 40th St	2nd Ave NE to 9th Ave NE	A	1:24	D	4:01
10	NE Campus Pkwy	Roosevelt Way NE to 15th Ave NE	A	1:00	A	1:27
11	NE Pacific St/NE Northlake Wy	6th Ave NE to 15th Ave NE	D	2:06	–	–
12	NE Pacific St	15th Ave NE to Montlake Blvd NE	C	2:12	C	1:37
13	7th Ave NE	NE 42nd St to NE 45th St	B	1:05	–	–
14	Roosevelt Way NE	NE Ravenna Blvd to NE 50th St	–	–	C	2:58
15	Roosevelt Way NE	NE 50th St to NE 45th St	–	–	D	2:20
16	Roosevelt Way NE	NE 45th St to NE Campus Pkwy	–	–	D	3:33
17	University Bridge	NE Campus Pkwy to Fuhrman Ave E	E	4:45	C	2:52
18	11th Ave NE	NE Ravenna Blvd to NE 50th St	E	4:29	–	–
19	11th Ave NE	NE 50th St to NE 45th St	E	2:35	–	–
20	11th Ave NE	NE 45th St to NE Campus Pkwy	C	2:45	–	–
21	University Wy NE	NE Ravenna Blvd to NE 50th St	E	3:32	C	2:11
22	University Way NE	NE 50th St to NE 45th St	D	2:09	B	1:02
23	University Way NE	NE 45th St to NE Pacific St	**F**	**6:05**	E	4:17
24	15th Ave NE	NE Ravenna Blvd to NE 50th St	D	3:37	B	2:28
25	15th Ave NE	NE 50th St to NE 45th St	E	2:46	B	1:34
26	15th Ave NE	NE 45th St to NE Pacific St	C	5:25	C	6:03

Source: OneBusAway API, 2013

not directly comparable to the auto transit times since the extents of the corridors vary somewhat. Details are provided in Appendix D.

Some of the transit trends are similar to the auto findings, in that congestion tends to be higher in the core of the U District. Segments of University Way NE and NE 45th Street operate at LOS F. Travel times to the north of the study area show the most directionality, with northbound roadways experiencing heavier congestion.

PEDESTRIAN AND BICYCLE NETWORK

As shown in Table 3.5–8, the share of trips made by pedestrians and bicycles in 2015 is estimated to be 29%. Note that this is an estimate for the 2015 base year, as predicted by the MXD tool which takes into account new projects that will be developed by 2015. These predicted mode shares vary from the ACS data cited in the Affected Environment section because MXD includes all trips (resident and commute trips) into/out of the study area as opposed to just trips made by study area residents. The underlying land uses and analysis years are also different from the ACS data.

Table 3.5–8: **PM Peak Hour Trip Generation — 2015**

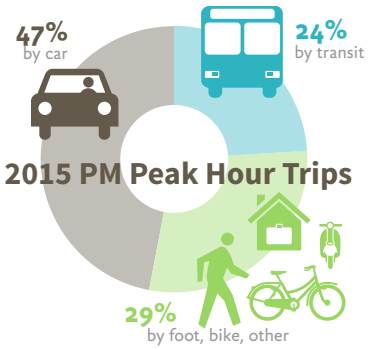
		Non-Auto	
2015 Conditions	**Auto**	Internal, Bicycle & Pedestrian	Transit
Trips	6,270	4,370	3,570
Mode Share	47%	29%	24%

Note: See Appendix D for details on the mode split calculation. Auto trips include both SOV and HOV trips, so the number reported is not equivalent to person-trips. The Internal, Bicycle, & Pedestrian and Transit categories are person-trips.

Source: Fehr & Peers, 2013

MXD Tool

The MXD tool estimates trip generation by mode based on the unique characteristics of the area, such as demographics, transit service, density, mix of land uses, and the built environment. This tool is described in more detail in the following section.



SAFETY

SDOT provided collision data for the period from January 2010 to September 2013. These results are expected to be representative of 2015 conditions. There were a total of 1,256 collisions between January 2010 and September 2013, 60 of which involved at least one pedestrian, and 70 of which involved a bicyclist. There have been two fatal collisions since 2010: one at Brooklyn Ave NE and NE 43rd Street involving a pedestrian, and the other at University Way NE and westbound NE Campus Parkway involving a bicyclist.

Based on the January 2010-September 2013 data, there are no High Accident Locations in the study area. The corridors with the highest average collision rates (between 5.3 and 6.1) are:

- NE 45th Street between 7th and 8th Avenue
- Roosevelt Way between NE 45th Street and NE 47th Street
- University Way NE between NE 45th Street and NE 47th Street

Of the 70 bicycle-involved collisions, the location with the highest frequency (a total of five) was the intersection of 15th Avenue NE and NE Pacific Street, which includes a Burke-Gilman Trail crossing. The majority of the collisions

were right turning vehicles colliding with cyclists. Of the 60 pedestrian-involved incidents, the location with the most collisions (a total of seven) was the intersection of Brooklyn Ave NE and NE 45th Street. The most common type of incident involved a turning vehicle colliding with a pedestrian; these collisions accounted for slightly less than half of all reported incidents at this intersection.

There is one pedestrian/bicycle intersection of interest, where there were approximately 1.9 pedestrian collisions per year:

- Brooklyn Avenue NE and NE 45th Street

Figure 3.5–14 maps the average number of collisions per year within the study area. Total bicycle and pedestrian collisions from January 2010 to September 2013 are mapped in Figure 3.5–15.

Analysis Methodology—Planning Scenarios Evaluated

Zoning Alternatives

All three alternatives assume essentially the same growth in households and employment.

The No Action Alternative maintains the current low-rise dispersed growth, while Alternatives 1 and 2 allow increased building height and intensity in the core of the U District.

This section describes the planning scenarios that will be evaluated and presents the methodology and assumptions used to analyze the alternatives.

Three alternatives are evaluated under future year 2035 conditions. These include a No Action scenario that maintains the U District's current zoning and two action alternatives, which would vary the neighborhood's zoning. All three alternatives assume essentially the same growth in new households and employment; the alternatives vary in how this growth would be accommodated. Alternative 3, the No Action Alternative, would continue the low-rise dispersed pattern of growth while Alternatives 1 and 2 would allow for varying degrees of increased building height and intensity, with growth more focused around the core of the U District.

TRANSPORTATION NETWORK AND LAND USE ASSUMPTIONS

Background traffic refers to traffic generated by land uses outside of the U District. U District generated traffic is added to this regional traffic to evaluate the 2035 transportation conditions.

This section assesses transportation system operations under 2035 for the three future year scenarios. The analysis used two tools to forecast traffic volumes and travel times: a citywide travel demand forecasting model to distribute and assign background vehicle traffic to area roadways and a more refined tool called MXD to project traffic volumes within the U District. These tools are discussed in more detail below.

Figure 3.5–14: **Annual Collision Rates**

Source: SDOT, 2013

Figure 3.5–15: **Pedestrian and Bicycle Collisions**

Source: SDOT, 2013

Source: SDOT, 2013

Citywide Travel Demand Forecasting Model

Beginning with the Seattle travel demand forecasting model, the transportation network assumptions within the study area and beyond were refined to create appropriate 2015 and 2035 networks. The following is a description of some of the travel demand model's key features.

- **Analysis Years.** This version of the model has a base year of 2015 and a horizon year of 2035. Travel forecasts were developed by updating the land use inputs and trip generation rates within the study area.
- **Land Use.** The City of Seattle developed estimates of study area land use forecasts for 2015 as well as for the three 2035 scenarios. These study area forecasts were used in combination with citywide land use forecasts (called Local Targets Representation) recently released by the Puget Sound Regional Council (PSRC).
- **Network Representation.** The highway and major street systems (including all study corridors) within the U District are fully represented in the model.
- **Transit.** The travel model has a full representation of the study area transit system under base year conditions. The horizon year transit system is based on assumptions of service from Sound Transit's 2035 travel demand model which was released in September 2013.
- **Travel Costs.** The model accounts for the effects of auto operating costs, parking, transit fares, and tolls (on SR 520) on travel demand.
- **Travel Demand.** The model predicts travel demand for seven modes of travel: drive alone, carpool (2 person), carpool (3 plus), transit, trucks, walking, and bicycling. Travel demand is estimated for five time periods. This analysis will focus on the PM peak hour.

Trip Generation Methodology

The project team used an innovative trip generation analysis technique known as the mixed-use development (MXD) model to analyze the base and future year scenarios. The MXD model is based on a growing body of research, which focuses on the relationship between travel and the built environment. This method supplements conventional trip generation methods to capture effects related to built environment variables (known as the Ds) like density, diversity of land uses, destinations (accessibility), development scale, pedestrian and bicycle design, distance to transit services, and demographics. The proposed action alternatives in the U District incorporate changes in a number of these variables that, in turn, would

influence the neighborhood's travel characteristics. In short, projects with higher densities, a rich variety of land uses close to one another, and high quality pedestrian, bicycle, and transit environments have a lower vehicle trip generation rate. Travelers have more choices in terms of both the travel mode they choose and the distance they must travel to reach various destinations. When these projects are located in urban areas such as the U District, this effect intensifies. The MXD method avoids overestimating the number of vehicle trips that infill projects generate and provides a more reasonable picture of how travel characteristics change over time.

The U District is already a mixed-use neighborhood with a high non-auto mode share. Therefore, the MXD was applied for both the 2015 and 2035 analyses.

The U District is already a mixed-use neighborhood with a high non-auto mode share. Therefore, the MXD was applied for both the 2015 and 2035 analyses.

The MXD model was applied to four subareas within the study area, as shown in Figure 3.5–16. The neighborhood boundaries were determined based on a number of factors, including the amount and character of land uses.

Transportation Network Assumptions

In revising the models to represent 2035 conditions, only "reasonably foreseeable" transportation improvement projects were included. Reasonably foreseeable projects are those that either have full funding commitments, or have partial funding commitments, but with a well-defined strategy in place to raise the remaining funds.

The assumptions were determined in conjunction with City staff using the best knowledge available at the time. Key assumptions are listed below. Note that some of these projects are reflected in the citywide travel demand model while others factor into the study-area specific MXD model:

Reasonably foreseeable projects

Projects with full funding commitments

Projects with partial funding commitments, but with a well-defined strategy in place to raise the remaining funds

- SR 520 improvements east of the Montlake interchange are assumed to be in place by 2035, but project elements to the west (connecting to I–5) and to the north (increased capacity on the Montlake Bridge) are not assumed.
- Link light rail—north-south between Lynnwood and Federal Way, and east to Overlake. Transit route modifications to connect to the Link light rail extension are also assumed, based on information from Sound Transit's travel demand forecasting model.
- Some level of pedestrian and bicycle improvements (as outlined in the Pedestrian Master Plan and Bicycle Master Plan) are assumed to occur over the 20-year planning period. Other projects that will be implemented in the near term include a neighborhood greenway on 12th Avenue NE and bicycle facility improvements on NE 40th Street.

Figure 3.5–16: **Neighborhoods Boundaries used for Trip Generation**

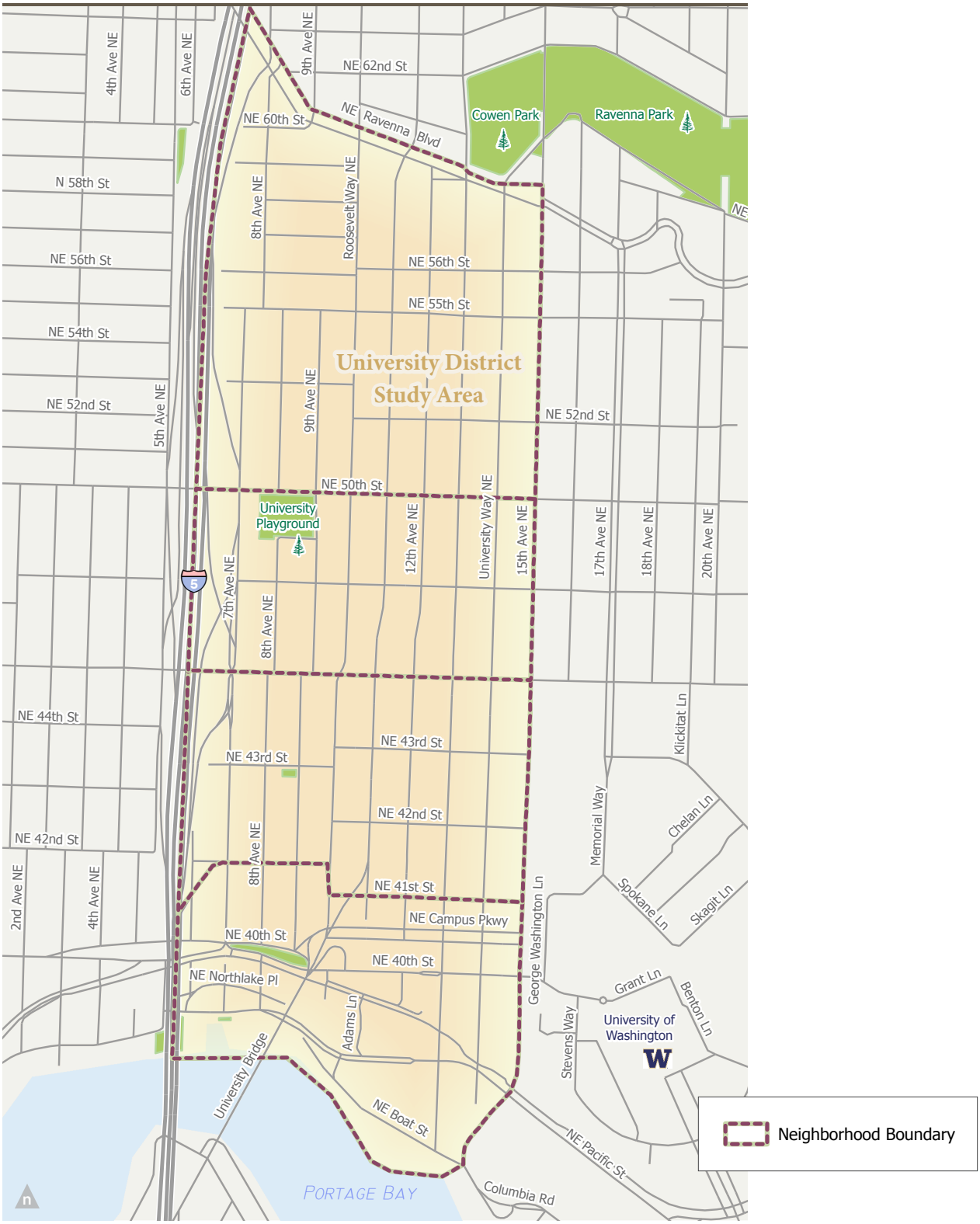
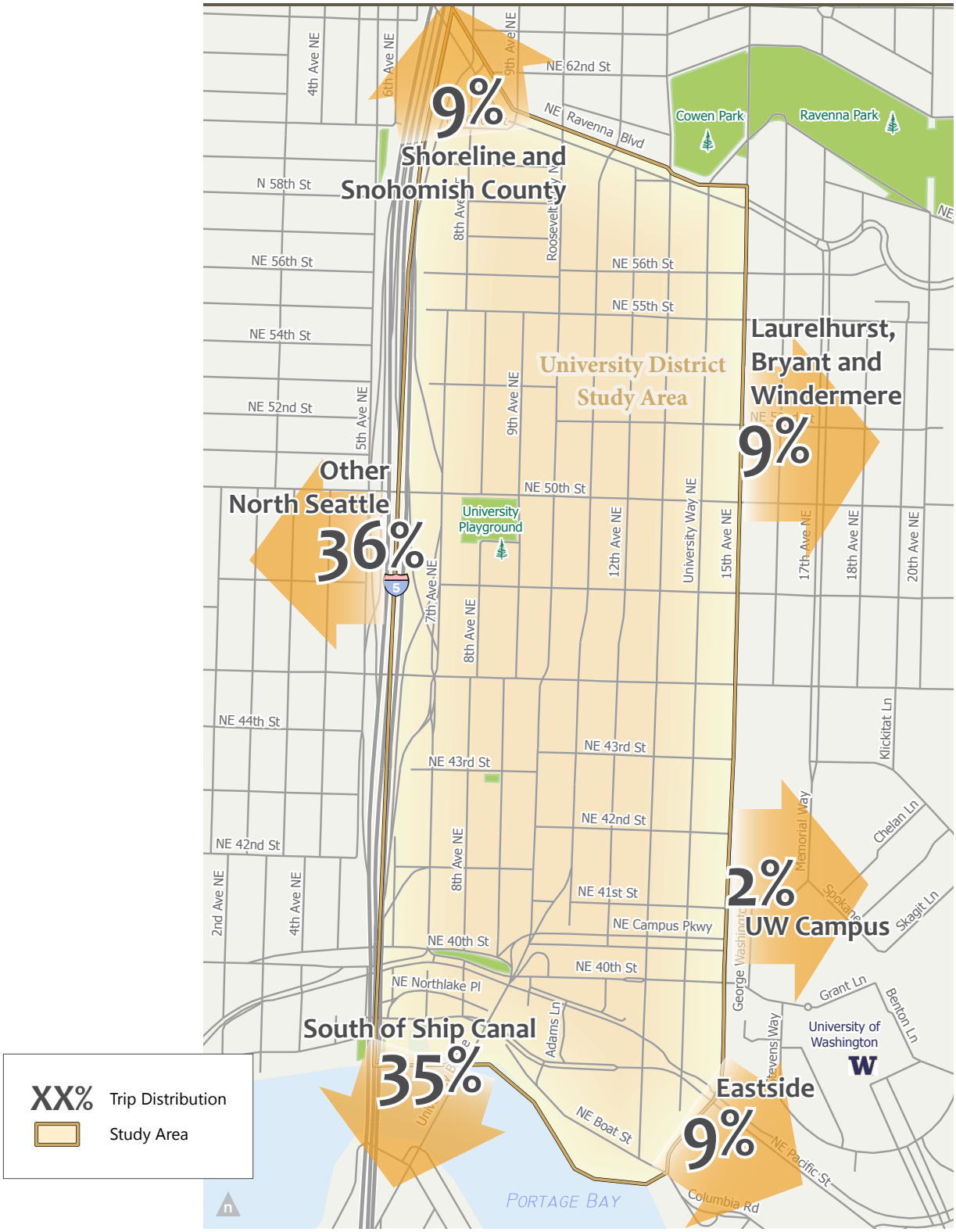


Figure 3.5–17: **External Vehicle Trip Distribution**



- Mid-block cut-throughs for non-motorized travel are assumed to be in place for all new developments of at least 20,000 SF in size (required as part of proposed incentive zoning regulations).

TRIP DISTRIBUTION

The project travel demand model distributed the vehicle trips projected in the MXD model as well as background traffic from other areas of the City. The travel model indicated the following general distribution pattern for vehicle trips to and from the U District during the PM peak period in 2035 (also shown in Figure 3.13-17).

- 2% to the University of Washington campus
- 9% to Laurelhurst, Bryant, and Windermere
- 36% to other North Seattle locations
- 9% north to Shoreline and Snohomish County
- 35% south of the Ship Canal (e.g. Downtown, Capitol Hill, and Queen Anne)
- 9% to the Eastside (e.g. Bellevue, Kirkland, and Redmond)

3.5.2 Significant Impacts

DEFICIENCIES OF THE NO ACTION ALTERNATIVE

Analysis results and environmental deficiencies of the No Action Alternative are summarized in this section. Deficiencies are defined if the No Action Alternative would:

- Cause the non-SOV mode share for the U District to fall below 70%.
- Cause the ratio between PM peak hour travel time and free-flow travel time to be greater than or equal to 3.33 (LOS F) for more than 20% of the total PM peak hour study segment Vehicle Miles Traveled (VMT). This threshold will be used for both auto and freight travel.
- Cause a transit segment to operate at LOS F.
- Cause an increase in vehicle, pedestrian, or bicycle volumes at a High Accident Location, as defined for existing conditions.

Vehicle Miles Traveled

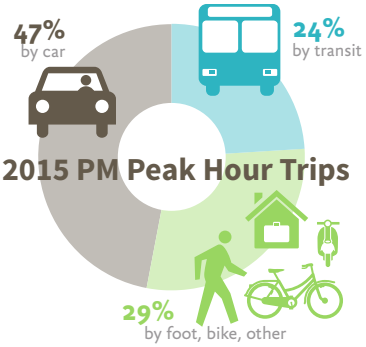
This metric is calculated as the product of the length of the roadway segment and the number of vehicle which travel upon it.

As defined above, deficiencies are future transportation operations are not expected to meet existing service standards. Future development, both within and outside of the study area, may contribute to these deficiencies. Individual project-level mitigation could reduce the magnitude of the deficiency; however, this level of detail is not known and cannot be considered in this programmatic EIS. In this case, the term deficiency does not refer to an existing transportation system issue that is the responsibility of the City to address.

The No Action Alternative serves as the baseline for the impact analysis of the action alternatives (Alternatives 1 and 2). It represents the operations of the transportation system if no actions were taken by the City Council and no zoning changes were made in the U District. The same transportation network (included all reasonably foreseeable transportation improvements) is assumed for the No Action Alternative and the two action alternatives.

PM peak period auto and transit travel time estimates were generated using the MXD model and the project travel demand model. This method accounts for background growth in traffic and transit ridership associated with increases in City and regional land uses over the next 20 years, as well as the varying patterns of land use growth within the U District.

Table 3.5–9 shows the trip generation estimate predicted by the MXD model for PM peak hour conditions. The pedestrian, bicycle, and transit mode share under the No Action Alternative is projected to increase substantially compared to the 2015 condition. Although the auto mode share percentage would decrease compared to 2015, the absolute number of auto trips would increase by roughly 12%.



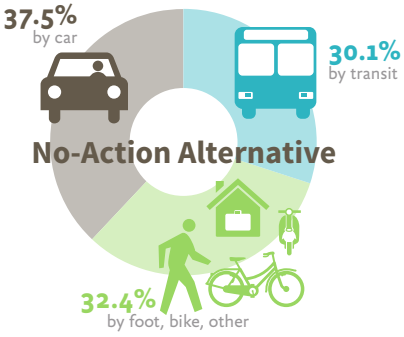


Table 3.5–9: **PM Peak Hour Trip Generation — No Action Alternative**

	Auto	Non-Auto: Internal, Bicycle & Pedestrian	Non-Auto: Transit
2015 Conditions			
Trips	6,270	4,370	3,570
Mode Share	47%	29%	24%
No Action Alternative — Current Zoning			
Trips	7,010	6,660	6,810
Mode Share	37.5%	32.4%	30.1%

Note: See Appendix D for details on the mode split calculation. Auto trips include both SOV and HOV trips, so the number reported is not equivalent to person-trips. The Internal, Bicycle, & Pedestrian and Transit categories are person-trips.

Source: Fehr & Peers, 2013

The ACS commute trip data cited in the Affected Environment section indicates that roughly a quarter of all auto trips are non-SOV (a conservative estimate for this application given that work trips tend to be weighted more heavily toward SOV). Therefore, the non-SOV mode share under the No Action Alternative is estimated to be 71.9%, meeting the City's mode split goal of 70% non-SOV.

Analysis Results

The following section describes the results of the evaluation of transportation conditions under the 2035 No Action Alternative.

AUTO & FREIGHT Table 3.5–10 and Figure 3.5–18 (on following pages) summarize the travel times along the auto/freight study corridors under the No Action Alternative. One of the U District's main connections to the south—the University Bridge—is projected to operate at LOS F in both directions by 2035. In addition, the following study corridors would operate at LOS F in 2035:

- Westbound NE 50th Street from 5th Avenue E to Latona Avenue E
- Westbound NE 40th Street from 9th Avenue NE to 2nd Avenue NE
- Southbound Roosevelt Way NE from NE 50th Street to NE 45th Street (also LOS F in 2015)
- Northbound 11th Avenue NE from NE 45th Street to NE 50th Street (also LOS F in 2015)

Many corridors internal to the study area are not expected to see substantial changes in travel times. The largest increases would be on roadways leading into and out of the study area, such as the University Bridge, NE Pacific Street and NE 40th Street. Traffic patterns may readjust to use alternate routes if some corridors become too congested.

These conditions are functions of growth in the study area, as well as growth in regional traffic that may only be passing through the U District. The congested operations on the study corridors identified above can also be assumed to translate to congested operations at key intersections along these corridors. The VMT on the LOS F corridors represent 18.9% of the total study segment VMT (calculations may be found in Appendix D).[8] Since less than 20% of VMT is expected to travel at LOS F conditions, no travel time deficiencies for auto or freight are identified under the No Action Alternative.

8 *The number of vehicles on each study segment was projected using the travel demand model. The product of the number of vehicles and the length of the segment yields the study segment Vehicle Miles Traveled (VMT). Finally, a ratio of the VMT on segments with deficiencies to the total VMT of study segments was calculated. See Appendix D for more details.*

Table 3.5–10: **2035 No Action Alternative — PM Peak Hour Auto Travel Times**

			2015				2035 No Action Alternative			
			North + Eastbound		south + Westbound		North + Eastbound		south + Westbound	
ID	Road	Segment	LOS	Travel Time	LOS	Travel Time	LOS	Travel Time	LOS	Travel Time
1	NE Ravenna Blvd	8th Ave NE to 15th Ave NE	E	3:13	E	3:00	E	3:16	E	3:03
2	NE 50th St	Latona Ave NE to 5th Ave NE	C	0:26	E	0:51	C	0:27	**F**	**0:53**
3	NE 50th St	5th Ave NE to Roosevelt Way NE	B	0:59	C	1:24	B	0:59	C	1:24
4	NE 50th St	Roosevelt Way NE to 15th Ave NE	D	1:50	A	0:59	D	1:51	A	0:59
5	NE 45th St	Latona Ave NE to 5th Ave NE	E	0:31	D	0:27	E	0:32	D	0:28
6	NE 45th St	5th Ave NE to Roosevelt Way NE	E	2:01	D	1:22	E	2:02	D	1:25
7	NE 45th St	Roosevelt Way NE to 15th Ave NE	D	2:09	D	2:16	D	2:09	D	2:17
8	NE 45th St	15th Ave NE to Montlake Blvd NE	B	2:15	B	2:26	B	2:34	B	2:26
9	NE 40th St	2nd Ave NE to 9th Ave NE	D	1:43	E	2:28	D	1:52	**F**	**2:41**
10	NE Campus Pkwy	Roosevelt Way NE to 15th Ave NE	Transit Corridor Only							
11	NE Pacific St/NE Northlake Wy	6th Ave NE to 15th Ave NE	D	2:56	B	1:40	D	2:57	B	1:44
12	NE Pacific St	15th Ave NE to Montlake Blvd NE	D	2:37	B	1:46	D	2:57	B	1:53
13	7th Ave NE	NE 42nd St to NE 45th St	Transit Corridor Only							
14	Roosevelt Way NE	NE Ravenna Blvd to NE 50th St	-	-	D	2:00	-	-	D	2:02
15	Roosevelt Way NE	NE 50th St to NE 45th St	-	-	**F**	**2:20**	-	-	**F**	**2:21**
16	Roosevelt Way NE	NE 45th St to NE Campus Pkwy	-	-	B	1:20	-	-	C	1:28
17	University Bridge	NE Campus Pkwy to Fuhrman Ave E	A	0:42	D	1:31	**F**	**3:12**	**F**	**3:17**
18	11th Ave NE	NE Ravenna Blvd to NE 50th St	C	1:36	-	-	C	1:45	-	-
19	11th Ave NE	NE 50th St to NE 45th St	**F**	**2:09**	-	-	**F**	**2:12**	-	-
20	11th Ave NE	NE 45th St to NE Campus Pkwy	E	2:38	-	-	E	2:52	-	-
21	University Way NE	NE Ravenna Blvd to NE 50th St	Transit Corridor Only							
22	University Way NE	NE 50th St to NE 45th St	Transit Corridor Only							
23	University Way NE	NE 45th St to NE Pacific St	Transit Corridor Only							
24	15th Ave NE	NE Ravenna Blvd to NE 50th St	C	1:21	C	1:21	C	1:22	C	1:25
25	15th Ave NE	NE 50th St to NE 45th St	D	1:19	E	1:36	D	1:20	E	1:39
26	15th Ave NE	NE 45th St to NE Pacific St	C	3:19	C	2:58	C	3:22	C	3:10

Source: Fehr & Peers, 2013

Figure 3.5–18:
2035 No Action Alternative—Auto Travel Time Level of Service

Note: LOS is shown for the direction with the longer travel time.

Although there are no travel time related impacts to freight, there may be potential issues with changes to loading zones or access needs as the area develops. At this programmatic level of analysis, it is not possible to evaluate these effects; these issues would need to be analyzed and mitigated at the project level.

TRANSIT As was the case under 2015 conditions, transit operations are assessed using travel time. The 2035 No Action Alternative transit travel times and LOS are shown in Table 3.5–11 and Figure 3.5–19 (on following pages). The following study corridors would operate at LOS F:

- Westbound NE 45th Street from Roosevelt Way NE to 5th Avenue NE (also LOS F in 2015)
- Northbound University Bridge from Fuhrman Avenue E to NE Campus Parkway
- Northbound University Way NE from NE Pacific Street to NE 45th Street (also LOS F in 2015)

Since buses would be traveling in general purpose lanes, the travel time trends discussed for autos also hold true for transit. However, since buses travel at slower speeds and stop frequently, the magnitude of the travel times changes are higher. This is particularly true on the University Bridge where travel times are expected to increase substantially.

Bus layover facilities (and potentially trolley infrastructure during construction) may be affected by future development. However, at this programmatic level of analysis, it is not possible to know how these transit facilities may be affected. Effects would need to be analyzed at the project level.

PEDESTRIAN & BICYCLE SYSTEM As shown in the trip generation table (Table 3.5–9), the land use development anticipated to occur under the No Action Alternative will result in a substantial number of pedestrian and bicycle trips within the study area. This level of pedestrian and bicycle activity will serve as the baseline against which impacts of the action alternatives will be assessed.

SAFETY As described earlier, the City of Seattle evaluates traffic safety concerns based on the definition of High Accident Locations. Since High Accident Locations calculate the average rate of collisions per year at intersections without any regard to the traffic flow through the intersection, the increased traffic volumes anticipated under the No Action Alternative could lead to the identification of additional High Accident Locations. While there may be more

High Accident Locations under future conditions with the No Action Alternative, there is no data available to suggest that a volume-based collision rate (e.g., collisions per million vehicles entering the intersection) will increase with buildout of the No Action Alternative.

One pedestrian intersection of interest was identified in the Affected Environment section: Brooklyn Avenue NE & NE 45th Street. This location is already signalized, but may experience an increase in the total number of collisions due to future growth in vehicle and pedestrian volumes through the intersection. This intersection was identified in the Pedestrian Master Plan (PMP) as a Tier 1 Improvement location, and should be prioritized for improvement as traffic volumes increase.

PARKING The Affected Environment section includes studies that show demand already exceeds supply during the evening hours in some areas of the U District. Additional land use within the study area would likely exacerbate this on-street parking supply issue, as well as potentially cause spillover into Roosevelt to the north and University Park to the east. Where parking supply is available, utilization rates would likely increase proportional to the growth in population. The duration of time that demand nears or exceeds supply would likely be longer than is currently the case. Since the No Action Alternative assumes more evenly distributed growth throughout the study area, effects would likely be spread over a larger area than the action alternatives. However, the City of Seattle has already established RPZs immediately north and east of the study area in University Park and Roosevelt. These RPZs are separate from the U District RPZ, reducing spillover from the study area. Additional RPZs could be established west of the study area if necessary.

IMPACTS OF THE ACTION ALTERNATIVES

The 2035 No Action Alternative serves as the baseline for identifying impacts to transportation facilities in 2035 caused by the action alternatives. A significant transportation impact is identified if an action alternative would:

- Cause the ratio between PM peak hour travel time and free-flow travel time to be greater than or equal to 3.33 (LOS F) for more than 20% of the total PM peak hour study segment VMT. This threshold will be used for both auto and freight travel.[9]

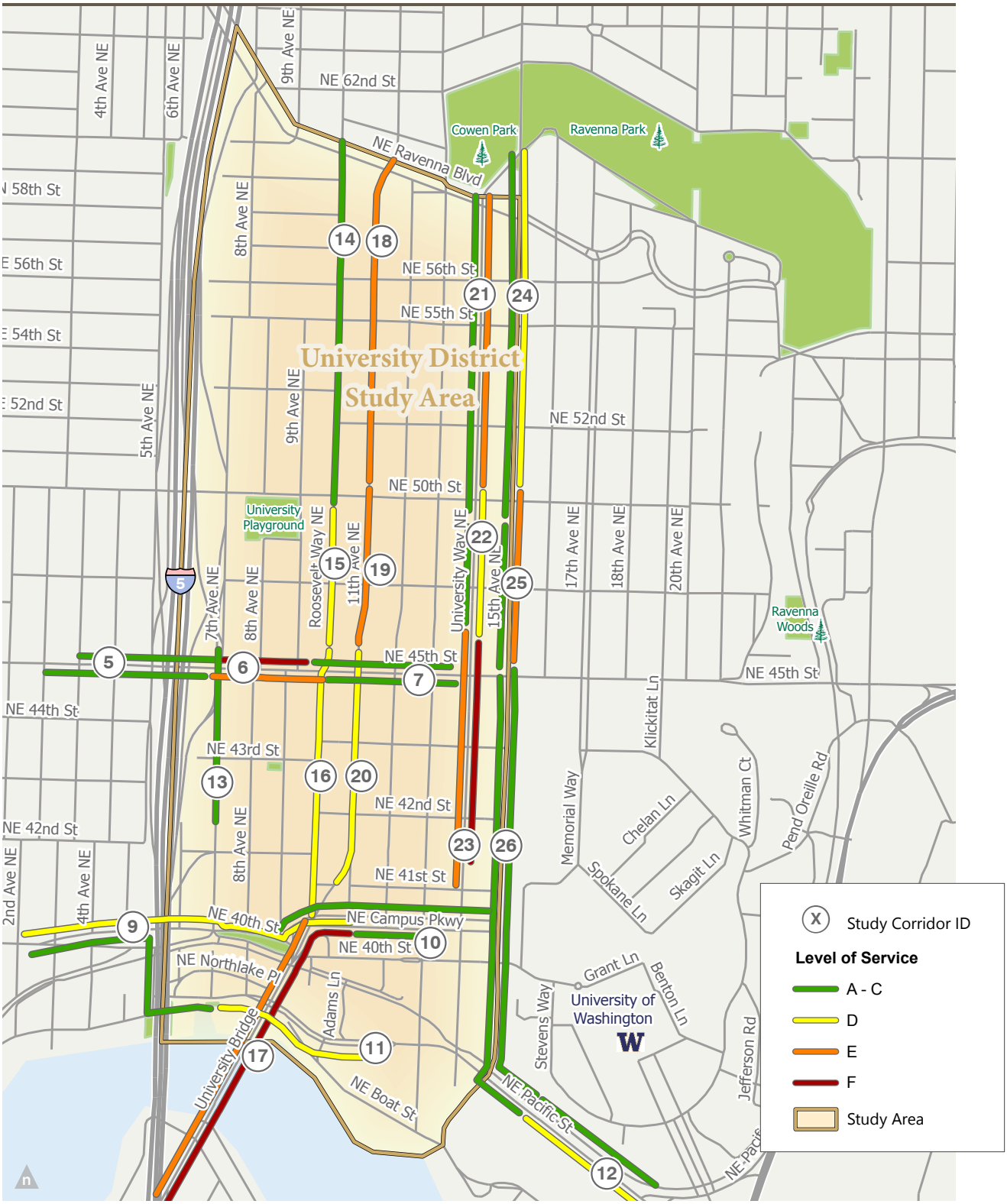
9 *This threshold is meant to achieve a point of balance between two ends of the spectrum: not so low as to allow very minor changes to trigger an impact, and also not so high as to dilute the meaning of the performance measure.*

Table 3.5–11: **2035 No Action Alternative — PM Peak Hour Transit Travel Times**

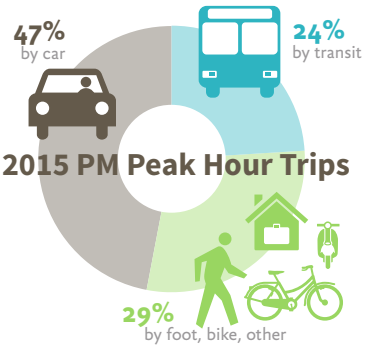
			2015				2035 No Action Alternative			
			North + Eastbound		south + Westbound		North + Eastbound		south + Westbound	
ID	Road	Segment	LOS	Travel Time	LOS	Travel Time	LOS	Travel Time	LOS	Travel Time
1	NE Ravenna Blvd	8th Ave NE to 15th Ave NE	Auto Corridor Only							
2	NE 50th St	Latona Ave NE to 5th Ave NE	Auto Corridor Only							
3	NE 50th St	5th Ave NE to Roosevelt Way NE	Auto Corridor Only							
4	NE 50th St	Roosevelt Way NE to 15th Ave NE	Auto Corridor Only							
5	NE 45th St	Latona Ave NE to 5th Ave NE	B	1:41	C	1:59	B	1:42	C	2:01
6	NE 45th St	5th Ave NE to Roosevelt Way NE	E	1:45	**F**	**2:10**	E	1:46	**F**	**2:11**
7	NE 45th St	Roosevelt Way NE to 15th Ave NE	A	1:41	C	2:49	A	1:41	C	2:49
8	NE 45th St	15th Ave NE to Montlake Blvd NE	Auto Corridor Only							
9	NE 40th St	2nd Ave NE to 9th Ave NE	A	1:24	D	4:01	A	1:27	D	4:22
10	NE Campus Pkwy	Roosevelt Way NE to 15th Ave NE	A	1:00	A	1:27	A	1:00	A	1:28
11	NE Pacific St/NE Northlake Wy	6th Ave NE to 15th Ave NE	D	2:06	-	-	D	2:07		-
12	NE Pacific St	15th Ave NE to Montlake Blvd NE	C	2:12	C	1:37	D	2:34	C	1:44
13	7th Ave NE	NE 42nd St to NE 45th St	B	1:05	-	-	C	1:27		
14	Roosevelt Way NE	NE Ravenna Blvd to NE 50th St	-	-	C	2:58	-	-	C	3:02
15	Roosevelt Way NE	NE 50th St to NE 45th St	-	-	D	2:20	-	-	D	2:22
16	Roosevelt Way NE	NE 45th St to NE Campus Pkwy	-	-	D	3:33	-	-	D	3:46
17	University Bridge	NE Campus Pkwy to Fuhrman Ave E	E	4:45	C	2:52	**F**	**7:15**	E	4:37
18	11th Ave NE	NE Ravenna Blvd to NE 50th St	E	4:29	-	-	E	4:43		-
19	11th Ave NE	NE 50th St to NE 45th St	E	2:35	-	-	E	2:40		-
20	11th Ave NE	NE 45th St to NE Campus Pkwy	C	2:45	-	-	D	3:09		-
21	University Way NE	NE Ravenna Blvd to NE 50th St	E	3:32	C	2:11	E	3:34	C	2:17
22	University Way NE	NE 50th St to NE 45th St	D	2:09	B	1:02	D	2:10	B	1:05
23	University Way NE	NE 45th St to NE Pacific St	**F**	**6:05**	E	4:17	**F**	**6:07**	E	4:38
24	15th Ave NE	NE Ravenna Blvd to NE 50th St	D	3:37	B	2:28	D	3:39	C	2:36
25	15th Ave NE	NE 50th St to NE 45th St	E	2:46	B	1:34	E	2:47	C	1:39
26	15th Ave NE	NE 45th St to NE Pacific St	C	5:25	C	6:03	C	5:30	C	6:23

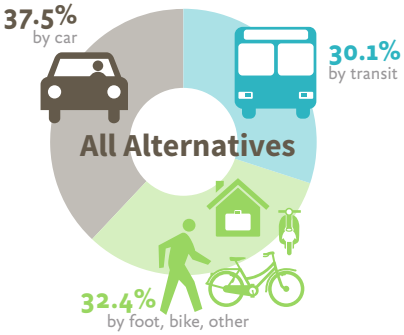
Source: Fehr & Peers, 2013

Figure 3.5–19:
2035 No Action Alternative—Transit Travel Time Level of Service



- Cause travel time on a transit analysis corridor to increase by more than 10% compared to the No Action Alternative or cause any increase on a transit analysis corridor already operating at LOS F under the No Action Alternative.
- Cause an increase in the proportion of pedestrian travel in an area with high priority pedestrian improvement needs, compared to the No Action Alternative.
- Cause an increase in the proportion of bicycle travel in an area with high priority bicycle improvement needs, compared to the No Action Alternative.
- Cause on-street parking demand to exceed on-street parking supply.
- Cause an increase in vehicle, pedestrian, or bicycle volumes at a High Accident Location compared to the No Action Alternative.





Analysis Results

This section provides the evaluation of each of the action alternatives in 2035. Due to the similarities of the action alternatives, they are both addressed in the same section to minimize redundancy. The alternatives are so similar because the total growth assumed in the study area is very similar. Although there are small variations on a segment level, the rezone alternatives are very similar from an area-wide transportation perspective. The impacts and potential mitigation measures for all alternatives are described in the following section.

Table 3.5–12: **2035 PM Peak Hour Trip Generation — All Alternatives**

		Non-Auto	
	Auto	Internal, Bicycle & Pedestrian	Transit
No Action Alternative — Current Zoning			
Trips	7,010	6,660	6,180
Mode Share	37.5%	32.4%	30.1%
Alternative 1 — Moderate Increases to Height and Density			
Trips	6,840	6,760	6,250
Mode Share	36.7%	32.9%	30.4%
Alternative 2 — Highest Increases to Height and Density			
Trips	6,880	6,740	6,240
Mode Share	36.8%	32.8%	30.4%

Note: See Appendix D for details on the mode split calculation. Auto trips include both SOV and HOV trips, so the number reported is not equivalent to person-trips. The Internal, Bicycle, & Pedestrian and Transit categories are person-trips.

Source: Fehr & Peers, 2013

Travel time estimates for each of the action alternatives use the same methodology as described for the No Action Alternative. Table 3.5–12 shows the trip generation estimate predicted by the MXD model for PM peak hour conditions.

Mode share percentages among the three alternatives are generally similar. However, both action alternatives have slightly lower auto mode shares

and slightly higher pedestrian, bicycle, and transit mode shares than the No Action Alternative.

Using the same HOV/SOV mode split assumptions as discussed in the No Action Alternative section, the non-SOV mode share under Alternatives 1 and 2 are estimated to be approximately 72.4 and 72.3%, respectively. Therefore, both action alternatives meet the City's 70% non-SOV mode split goal, so no mode share impacts are expected.

The following section describes the results of the evaluation of transportation conditions under each of the action alternatives in 2035.

AUTO AND FREIGHT Table 3.5–13 and Figure 3.5–20 (on following pages) summarize the travel times along the study corridors under Alternatives 1 and 2. The following study corridors would operate at LOS F under both action alternatives:

- Westbound NE 50th Street from 5th Avenue NE to Latona Avenue NE
- Westbound NE 40th Street from 9th Avenue NE to 2nd Avenue NE
- Southbound Roosevelt Way NE from NE 50th Street to NE 45th Street
- University Bridge between Fuhrman Avenue E and NE Campus Parkway in both directions
- Northbound 11th Avenue NE from NE 45th Street to NE 50th Street

The poor operations on the study corridors identified above can also be assumed to translate to poor operations at key intersections along these corridors. The LOS F corridors represent 19.0% of the total study segment VMT operating at LOS F for both Alternatives 1 and 2. Although a slightly higher percentage of the study segment VMT would operate at LOS F conditions (compared to the No Action Alternative), the difference does not meet the threshold defined for a significant auto impact. Therefore, no significant auto impacts are expected.

The corridors listed above would also operate at LOS F under the No Action Alternative. The scenarios would operate so similarly because the overall level of growth in the study area is the essentially the same among all three alternatives. Although the concentration of buildings within the U District would vary, a very similar number of travelers would be moving in and out of the area.

Table 3.5–13: **2035 Alternatives — PM Peak Hour Auto Travel Times**

			No Action Alternative		Alternative 1		Alternative 2	
ID	**Road**	**Segment**	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
1	NE Ravenna Blvd	8th Ave NE to 15th Ave NE	E / 3:16	E / 3:03	E / 3:16	E / 3:03	E / 3:16	E / 3:03
2	NE 50th St	Latona Ave NE to 5th Ave NE	C / 0:27	**F / 0:53**	C / 0:27	**F / 0:53**	C / 0:27	**F / 0:53**
3	NE 50th St	5th Ave NE to Roosevelt Way NE	B / 0:59	C / 1:24	B / 0:59	C / 1:24	B / 0:59	C / 1:24
4	NE 50th St	Roosevelt Way NE to 15th Ave NE	D / 1:51	A / 0:59	D / 1:51	A / 0:59	D / 1:51	A / 0:59
5	NE 45th St	Latona Ave NE to 5th Ave NE	E / 0:32	D / 0:28	E / 0:32	D / 0:28	E / 0:32	D / 0:28
6	NE 45th St	5th Ave NE to Roosevelt Way NE	E / 2:02	D / 1:25	E / 2:01	D / 1:25	E / 2:01	D / 1:25
7	NE 45th St	Roosevelt Way NE to 15th Ave NE	D / 2:09	D / 2:17	D / 2:09	D / 2:17	D / 2:09	D / 2:16
8	NE 45th St	15th Ave NE to Montlake Blvd NE	B / 2:34	B / 2:26	B / 2:34	B / 2:26	B / 2:34	B / 2:26
9	NE 40th St	2nd Ave NE to 9th Ave NE	D / 1:52	**F / 2:41**	D / 1:53	**F / 2:41**	D / 1:52	**F / 2:41**
10	NE Campus Pkwy	Roosevelt Way NE to 15th Ave NE	Transit Corridor Only					
11	NE Pacific St/NE Northlake Wy	6th Ave NE to 15th Ave NE	D / 2:57	B / 1:44	D / 2:57	B / 1:44	D / 2:57	B / 1:44
12	NE Pacific St	15th Ave NE to Montlake Blvd NE	D / 2:57	B / 1:53	D / 2:58	C / 1:54	D / 2:58	C / 1:54
13	7th Ave NE	NE 42nd St to NE 45th St	Transit Corridor Only					
14	Roosevelt Way NE	NE Ravenna Blvd to NE 50th St	--	D / 2:02	--	D / 2:02	--	D / 2:03
15	Roosevelt Way NE	NE 50th St to NE 45th St	--	**F / 2:21**	--	**F / 2:21**	--	**F / 2:21**
16	Roosevelt Way NE	NE 45th St to NE Campus Pkwy	--	C / 1:28	--	C / 1:29	--	C / 1:29
17	University Bridge	NE Campus Pkwy to Fuhrman Ave E	**F / 3:12**	**F / 3:17**	**F / 3:22**	**F / 3:24**	**F / 3:26**	**F / 3:23**
18	11th Ave NE	NE Ravenna Blvd to NE 50th St	C / 1:45	--	C / 1:45	--	C / 1:45	--
19	11th Ave NE	NE 50th St to NE 45th St	**F / 2:12**	--	**F / 2:12**	--	**F / 2:12**	--
20	11th Ave NE	NE 45th St to NE Campus Pkwy	E / 2:52	--	E / 2:53	--	E / 2:53	--
21	University Way NE	NE Ravenna Blvd to NE 50th St	Transit Corridor Only					
22	University Way NE	NE 50th St to NE 45th St	Transit Corridor Only					
23	University Way NE	NE 45th St to NE Pacific St	Transit Corridor Only					
24	15th Ave NE	NE Ravenna Blvd to NE 50th St	C / 1:22	C / 1:25	C / 1:22	C / 1:26	C / 1:22	C / 1:26
25	15th Ave NE	NE 50th St to NE 45th St	D / 1:20	E / 1:39	D / 1:20	E / 1:39	D / 1:20	E / 1:39
26	15th Ave NE	NE 45th St to NE Pacific St	C / 3:22	C / 3:10	C / 3:22	C / 3:10	C / 3:22	C / 3:09

Source: Fehr & Peers, 2013

Figure 3.5–20: **2035 Alternatives 1 and 2—Auto Travel Time Level of Service**

Note: LOS is shown for the direction with the longer travel time.

Since freight operates on the same corridors as autos, there are no travel time related impacts expected for freight. At this programmatic level of analysis, it is not possible to know how freight may be impacted by changes to loading zones or access needs. These are potentially significant impacts that will need to be analyzed and mitigated at the project level.

TRANSIT Transit travel times and LOS are shown in Table 3.5–14 and Figures 3.5–21 (on following pages). The following study corridors would operate at LOS F under Alternatives 1 and 2:

- Westbound NE 45th Street from Roosevelt Way NE to NE 5th Avenue
- Northbound University Bridge from Fuhrman Avenue E to NE Campus Parkway
- Northbound University Way NE from NE Pacific Street to NE 45th Street

Criteria for a transit impact

Travel time at least 10% longer than the No Action Alternative

Travel time any longer than the No Action Alternative if the corridor was already operation at LOS F

All three of the preceding LOS F corridors are also forecast to operate at LOS F under the No Action Alternative. Three corridors meet the impact criteria under Alternative 1:

- Northbound 7th Avenue NE from NE 42nd Street to NE 45th Street
- Northbound University Bridge from Fuhrman Avenue E to NE Campus Parkway
- Northbound University Way NE from NE Pacific Street to NE 45th Street

One corridor meets the impact criteria under Alternative 2:

- Northbound University Bridge from Fuhrman Avenue E to NE Campus Parkway

While the travel time along northbound 7th Avenue NE is expected to grow by more than 10% compared to the No Action Alternative, that corridor would still operate at LOS C. Moreover, with University Link light rail open in the future, it is likely that fewer buses would be using that route.

Bus layover facilities (and potentially trolley infrastructure during construction) may be affected by future development. However, at this programmatic level of analysis, it is not possible to know how these transit facilities may be affected. Effects would need to be analyzed at the project level.

Criteria for a pedestrian or bicycle impact

Increase in the proportion of pedestrian or bicycle travel in the study area compared to the No Action Alternative

PEDESTRIAN & BICYCLE SYSTEM As shown in the trip generation table (Table 3.5–12), the land use development anticipated to occur under both of the action alternatives would result in an increase in the pedestrian and bicycle trip mode share within the study area, compared to the No Action Alternative. Based on the proposed change to zoning, the area that may see the largest increase in pedestrian and bicycle travel is between NE 50th

Street and NE 42nd Street. In particular, the Link light rail station at Brooklyn Avenue NE and NE 45th Street will be a major pedestrian and bicycle trip destination. Since the City's Pedestrian Master Plan and Bicycle Master Plan have identified high priority improvement needs within the study area, this increase in facility users results in a significant impact.

SAFETY Since no High Accident Locations were identified in the study area, no safety impacts are anticipated. As described under the No Action Alternative analysis, while it is likely that the total number of vehicle collisions would increase proportionally with the increase in traffic, there is nothing to suggest that the volume-based rate of vehicle-to-vehicle collisions would increase with the implementation of the action alternatives. It should also be noted that overall vehicle traffic under the action alternatives is expected to be lower than under the No Action Alternative.

Criteria for a safety impact

Increase in vehicle, pedestrian or bicycle volumes at a High Accicdent Location compared to the No Action Alternative

As noted under the No Action Alternative, the intersection of Brooklyn Avenue NE and NE 45th Street was identified in the Affected Environment section as a pedestrian intersection of interest. This location may experience an increase in the total number of collisions due to future growth in vehicle and pedestrian volumes through the intersection; however, this does not constitute an impact. This intersection was identified in the PMP as a Tier 1 Improvement location, and should be prioritized for improvement as traffic volumes increase.

PARKING The Affected Environment section includes studies that show demand already exceeds supply during the evening hours in some areas of the U District. As with the No Action Alternative, additional land use within the study area would likely exacerbate this on-street parking supply issue. Demand for parking would likely be more concentrated around the core of the U District, since the land use patterns of the action alternatives is less dispersed than the No Action Alternative. Therefore, potential impacts to on-street parking supply within the U District are expected, as well as potential spillover impacts into Roosevelt to the north and University Park to the east.

Criteria for a parking impact

On-site parking demand in excess of on-street parking suppy

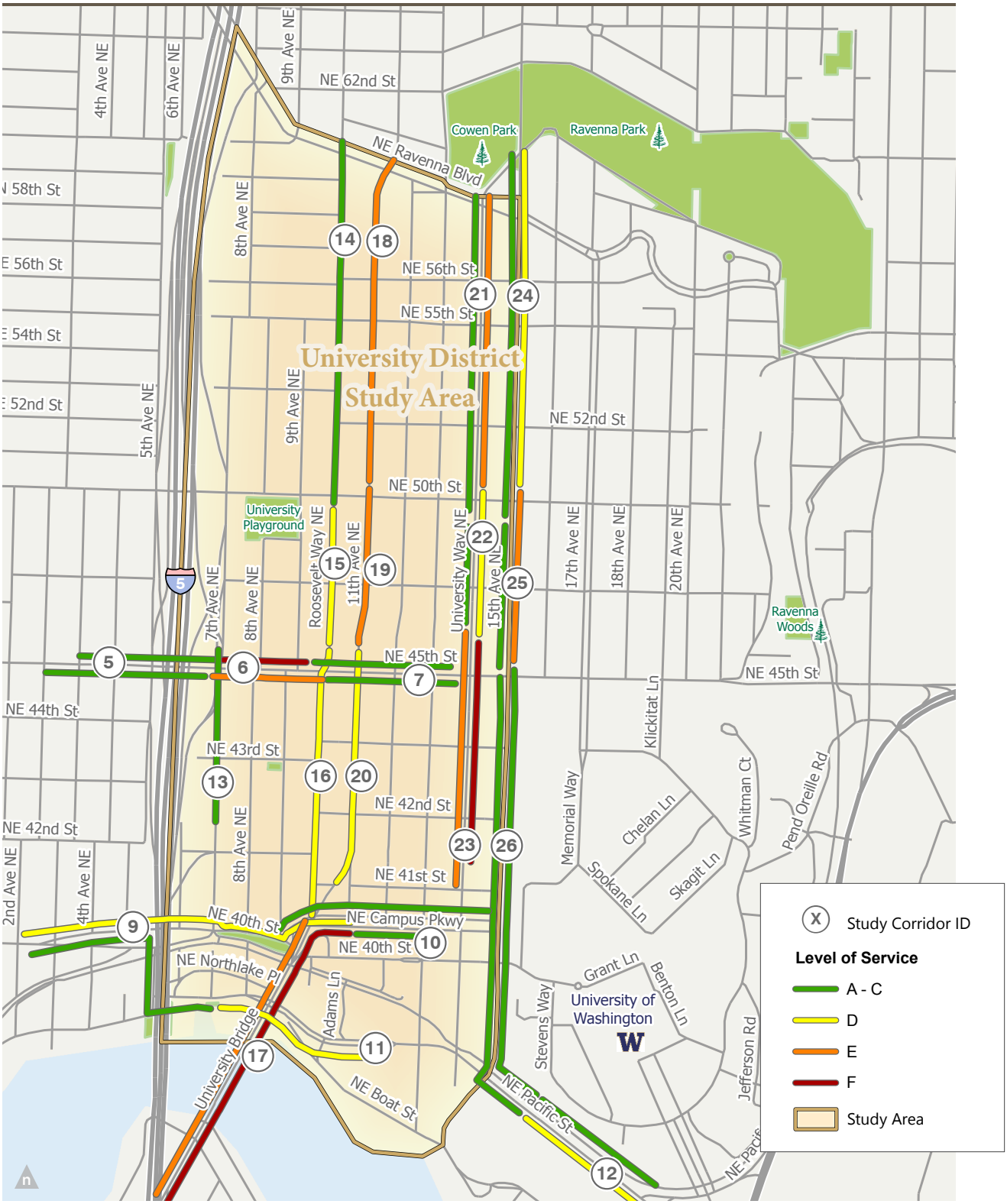
However, the City of Seattle has already established RPZs immediately north and east of the study area. These RPZs are separate from the U District RPZ, reducing spillover from the study area. SDOT actively manages paid parking rates, time limits and hours of operation in the business district through the Performance-Based Parking Pricing Program. As demand increases for the on-street parking, SDOT can make rate, time limit or hours of operation adjustments to maintain availability and turnover for business customers and visitors.

Table 3.5–14: **2035 Alternatives — PM Peak Hour Transit Travel Times**

			No Action Alternative		Alternative 1		Alternative 2	
ID	**Road**	**Segment**	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
1	NE Ravenna Blvd	8th Ave NE to 15th Ave NE	Auto Corridor Only					
2	NE 50th St	Latona Ave NE to 5th Ave NE	Auto Corridor Only					
3	NE 50th St	5th Ave NE to Roosevelt Way NE	Auto Corridor Only					
4	NE 50th St	Roosevelt Way NE to 15th Ave NE	Auto Corridor Only					
5	NE 45th St	Latona Ave NE to 5th Ave NE	B / 1:42	C / 2:01	B / 1:42	C / 2:01	B / 1:42	C / 2:01
6	NE 45th St	5th Ave NE to Roosevelt Way NE	E / 1:46	**F / 2:11**	E / 1:46	**F / 2:11**	E / 1:46	**F / 2:11**
7	NE 45th St	Roosevelt Way NE to 15th Ave NE	A / 1:41	C / 2:49	A / 1:41	C / 2:49	A / 1:41	C / 2:48
8	NE 45th St	15th Ave NE to Montlake Blvd NE	Auto Corridor Only					
9	NE 40th St	2nd Ave NE to 9th Ave NE	A / 1:27	D / 4:22	A / 1:27	D / 4:22	A / 1:27	D / 4:22
10	NE Campus Pkwy	Roosevelt Way NE to 15th Ave NE	A / 1:00	A / 1:28	A / 1:01	A / 1:28	A / 1:01	A / 1:28
11	NE Pacific St/NE Northlake Wy	6th Ave NE to 15th Ave NE	D / 2:07	--	D / 2:07	--	D / 2:07	--
12	NE Pacific St	15th Ave NE to Montlake Blvd NE	D / 2:34	C / 1:44	D / 2:35	C / 1:45	D / 2:35	C / 1:45
13	7th Ave NE	NE 42nd St to NE 45th St	C / 1:27	--	C / 1:36	--	C / 1:29	--
14	Roosevelt Way NE	NE Ravenna Blvd to NE 50th St	--	C / 3:02	--	C / 3:02	--	C / 3:03
15	Roosevelt Way NE	NE 50th St to NE 45th St	--	D / 2:22	--	D / 2:22	--	D / 2:22
16	Roosevelt Way NE	NE 45th St to NE Campus Pkwy	--	D / 3:46	--	D / 3:47	--	D / 3:48
17	University Bridge	NE Campus Pkwy to Fuhrman Ave E	**F / 7:15**	E / 4:37	**F / 7:25**	E / 4:45	**F / 7:29**	E / 4:44
18	11th Ave NE	NE Ravenna Blvd to NE 50th St	E / 4:43	--	E / 4:43	--	E / 4:43	--
19	11th Ave NE	NE 50th St to NE 45th St	E / 2:40	--	E / 2:41	--	E / 2:40	--
20	11th Ave NE	NE 45th St to NE Campus Pkwy	D / 3:09	--	D / 3:10	--	D / 3:11	--
21	University Way NE	NE Ravenna Blvd to NE 50th St	E / 3:34	C / 2:17	E / 3:34	C / 2:17	E / 3:34	C / 2:17
22	University Way NE	NE 50th St to NE 45th St	D / 2:10	B / 1:05	D / 2:10	B / 1:05	D / 2:10	B / 1:05
23	University Way NE	NE 45th St to NE Pacific St	**F / 6:07**	E / 4:38	**F / 6:08**	E / 4:39	**F / 6:07**	E / 4:40
24	15th Ave NE	NE Ravenna Blvd to NE 50th St	D / 3:39	C / 2:36	D / 3:40	C / 2:36	D / 3:40	C / 2:36
25	15th Ave NE	NE 50th St to NE 45th St	E / 2:47	C / 1:39	E / 2:47	C / 1:39	E / 2:47	C / 1:38
26	15th Ave NE	NE 45th St to NE Pacific St	C / 5:30	C / 6:23	C / 5:30	C / 6:23	C / 5:30	C / 6:22

Source: Fehr & Peers, 2013

Figure 3.5–21: **2035 Alternatives 1 and 2—Transit Travel Time Level of Service**



3.5.3 Mitigating Measures

This section identifies potential mitigation measures that could be implemented to lessen the magnitude of the transit, freight, pedestrian, bicycle, and parking impacts identified in the previous section. Although no significant auto impacts were identified for Alternatives 1 or 2 (as compared to the No Action Alternative), some of the mitigation strategies included here would help to encourage use of non-SOV modes, reducing auto congestion.

Proven strategies to decrease vehicle demand include incentives to take transit (such as employer-subsidized transit passes) and disincentives to drive (such as parking management strategies). From both a policy and feasibility perspective, increasing roadway capacity in the U District is undesirable and cost-prohibitive. Therefore, the mitigation strategy for this project focuses on methods to improve the facilities and operations for non-auto modes.

Given the area-wide scale of the zoning alternatives, the recommended mitigation strategy focuses on three main themes:

1. **IMPROVING THE PEDESTRIAN & BICYCLE NETWORK** Projects listed in various plans and documents including the Pedestrian Master Plan (PMP)[10], Bicycle Master Plan (BMP), University Area Transportation Action Strategy (UATAS), and U District Urban Design Framework (UDF) were considered as mitigation measures to address pedestrian and bicycle impacts. There is a well-documented link between improved bicycle and pedestrian accessibility and reduced demand for vehicle travel. Moreover, impacts were identified based on the presence of high priority improvement needs within the study area. To mitigate these impacts, the City could pursue these improvements.
2. **IMPLEMENTING SPEED & RELIABILITY IMPROVEMENTS** The Seattle Transit Master Plan (TMP) identified numerous projects to improve transit speed and reliability in the U District. In conjunction with other funding sources, new development could pay for a share of TMP improvements on key routes.
3. **EXPANDING TRAVEL DEMAND MGMT & PARKING STRATEGIES** Given cost, right-of-way, and environmental constraints, it was deemed infeasible to provide additional roadway and intersection

10 The Pedestrian Master Plan identifies locations where sidewalk or crossing improvements are desirable, but does not propose specific solutions. The project team assumed sidewalks and crossings would be added or improved where it was reasonably clear that was the relevant improvement.

capacity beyond what is currently planned to reduce impacts to traffic congestion (which affects transit) and freight mobility. Therefore, managing demand for auto travel is a critical element to reducing auto, freight, and transit congestion. The City and UW have well established Commute Trip Reduction (CTR) and Transportation Management Programs (TMP) in the area. This mitigation strategy looks to expand on the travel demand management strategies proposed as part of the CTR and TMP programs to include new parking-related strategies.

The three potential mitigation packages are listed in more detail below; many of the potential individual mitigation measures are also shown in Figures 3.5–22 and 3.5–23. The Puget Sound region is making a substantial investment in the Link light rail system, and the projects that are recommended below would serve to enhance that investment by maximizing the benefits of high capacity transit to the U District. The following sections present an example of the types of projects that could be implemented—other projects could achieve similar results.

Pedestrian & Bicycle System

Improvements to the pedestrian and bicycle system would mitigate impacts to facility users by providing a more robust system and addressing high priority improvement locations identified by the PMP and BMP. Based on a review of the PMP, UATAS, and UDF, the projects shown in Table 3.5–15 and Figure 3.5–22 have been identified as potential mitigation measures. This list will continue to evolve and is not prescriptive as other plans identify other projects that may also improve the non-motorized network. This simply reflects a sample package of projects that could be pursued to improve the overall network. Development Standards codes could also be modified to include requirements for wider sidewalks, particularly along greenways and green streets to promote walking and bicycling.

TRANSIT SPEED AND RELIABILITY IMPROVEMENTS

Transit and freight travel times could be reduced by providing speed and reliability improvements on key routes. Specific projects on key transit corridors were identified in the 2012 Transit Master Plan, as listed in Table 3.5–16. SDOT has identified similar ITS solutions on NE Pacific Street, which is

Figure 3.5–22: **Pedestrian and Bicycle Potential Mitigation Measures**

Source: Seattle BMP, 2013 / Seattle PMP, 2009

Table 3.5–15: **Pedestrian and Bicycle Potential Mitigation Measures**

NO.	SOURCE	Project
1	PMP, UDF & UATAS	Reconfigure north end of University Bridge to improve pedestrian/bicycle crossing
2	PMP & UDF	Construct pedestrian/bicycle crossing at NE 47th Street over I–5
3	UATAS	Expand width of NE 45th Street crossing over I–5 for bicycles lanes and improved sidewalks
4	UATAS	Reconfigure University Way to provide dedicated bicycle facilities, wider sidewalks, and improve urban design
5	PMP	Address all PMP Tier 1 and Tier 2 improvements needs in the study area
6	PMP	Construct separated bicycle facility on Roosevelt Way NE and 11th Avenue NE
7	PMP	Construct separated bicycle facility on University Bridge
8	PMP	Construct enhanced pedestrian facilities on 7th Avenue NE
9	University of Washington	Construct separated bicycle facility on 15th Avenue NE
10	UW Burke-Gilman Trail Design Concept Plan	Burke-Gilman Trail Improvements (owned by UW through study area)
Areawide	PMP	Address all PMP Tier 1 and Tier 2 improvements needs in the study area
Areawide	City Staff	Prohibit left turns at intersections with pedestrian and/or bicycle safety concerns

Note: The Pedestrian Master Plan identifies locations where sidewalk or crossing improvements are desirable, but does not propose specific solutions. The project team assumed sidewalks and crossings would be added or improved where it was reasonably clear that was the relevant improvement.

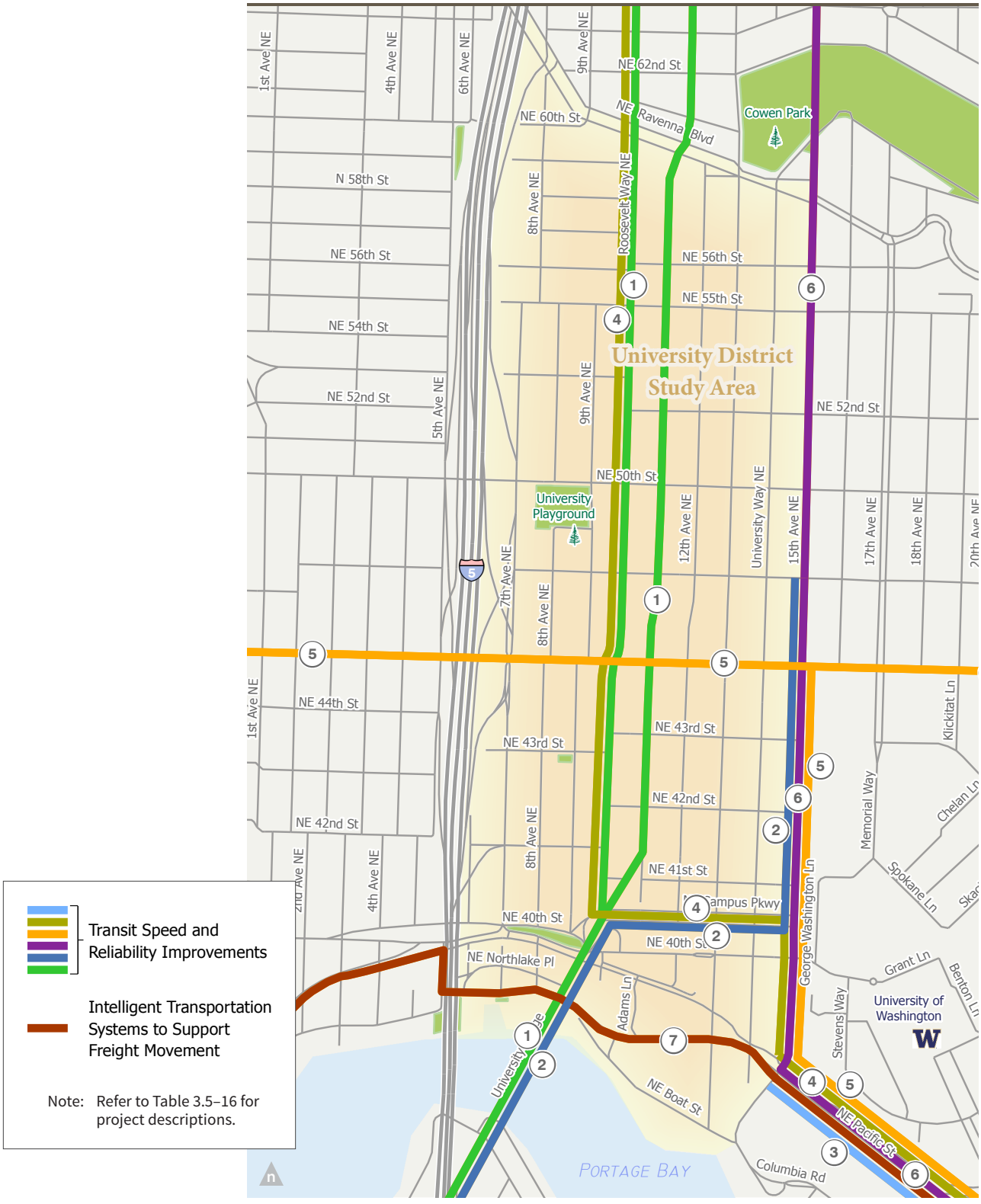
Sources ***PMP*** *2009 Pedestrian Master Plan*
UATAS *2008 University Area Transportation Action Strategy*
UDF *2013 U District Urban Design Framework*

an important corridor for freight mobility, although it has not been identified as being impacted by either of the rezone alternatives.

As with the pedestrian and bicycle measures, this transit and freight list will continue to evolve and is not exhaustive as other plans identify other projects that may also improve the transit and freight mobility. This list reflects a sample package of projects that could be pursued to improve the overall network.

The potential mitigation measures described above extend far beyond the study area in most cases. The relevant improvements within the U District are shown in Figure 3.5–23. Transit signal priority would be installed on Roosevelt Way NE, 11th Avenue NE, the University Bridge, 15th Avenue NE, NE Campus Parkway, and NE Pacific Street. Transit only or Business Access

Figure 3.5–23: **Transit and Freight Potential Mitigation Measures**



Source: Seattle BMP, 2013 / Seattle PMP, 2009

Table 3.5–16: **Potential Transit Mitigation Measures**

NO.	SOURCE	Project
1	TMP	**Seattle High Capacity Corridor 8** Eastlake HCT linking Downtown, Roosevelt and the U District via Eastlake Avenue E – Rail, streetcar or BRT
2	TMP	**Seattle Priority Bus Corridor 3** Othello-U District via Beacon Ave and Broadway. Capital components to support efficient and convenient transit service, such as queue jump lanes, transit lanes, bike/ped facilities, bus bulbs, ITS, transit shelters, pavement upgrades, street configuration redesign, signals, signage, and lighting.
3	TMP	**Seattle Priority Bus Corridor 5** Rainier Valley-U District via Rainier Ave and 23rd Ave (portions already underway). Capital components to support efficient and convenient transit service, such as queue jump lanes, transit lanes, bike/ped facilities, bus bulbs, ITS, transit shelters, pavement upgrades, street configuration redesign, signals, signage, and lighting. Upgrade signals to support ITS implementation throughout the corridor to support traffic adaptive operations including detection, communication, congestion, and travel time data collection.
4	TMP	**Seattle Priority Bus Corridor 12** Lake City-Northgate-U District via Northgate Way and 5th Ave. Capital components to support efficient and convenient transit service, such as queue jump lanes, transit lanes, bike/ped facilities, bus bulbs, ITS, transit shelters, pavement upgrades, street configuration redesign, signals, signage, and lighting. ITS detection needed to run corridor in traffic adaptive operation to support freight movement on NE Pacific Street.
5	TMP	**Seattle Priority Bus Corridor 13/13A** Ballard-U District-Laurelhurst via Market and NE 45th Streets. Capital components to support efficient and convenient transit service, such as queue jump lanes, transit lanes, bike/ped facilities, bus bulbs, ITS, transit shelters, pavement upgrades, street configuration redesign, signals, signage, and lighting. Include detection and communication to support traffic adaptive operations on NE Pacific Street and NE 45th Street and to support congestion and travel time data on NE 45th Street.
6	TMP	**Seattle Priority Bus Corridor 14** Crown Hill-Green Lake-U District. Capital components to support efficient and convenient transit service, such as queue jump lanes, transit lanes, bike/ped facilities, bus bulbs, ITS, transit shelters, pavement upgrades, street configuration redesign, signals, signage, and lighting. Project also needs to improve freight and ped/bike safety and signalization, including upgrades to cabinets, fiber communications, and traffic adaptive operations on NE 85th Street and NE Pacific Street to support freight movement.
7	SDOT ITS Program	**NE Pacific Street Corridor ITS** Include detection and communication to support traffic adaptive operations to support freight movement.

Sources: TMP 2012 Transit Master Plan / SDOT ITS Program

and Transit (BAT) lanes may be implemented along Roosevelt Way NE and 11th Avenue NE. Note that implementation of dedicated transit lanes may have secondary impacts on parking supply if a parking lane is taken.

TRAVEL DEMAND MANAGEMENT AND PARKING STRATEGIES

The City of Seattle could consider enhancing the travel demand management programs already in place in the U District. Research by the California Air Pollution Control Officers Association (CAPCOA), which is composed of air quality management districts in that state has shown that implementation of travel demand management programs can substantially reduce vehicle trip generation, which in turn reduces congestion for transit, freight, and autos. The specific measures described below are all potential projects, but are not assumed to be in place for the mitigation analysis.

Parking maximums would limit the number of parking spaces which can be built with new development. The City could also review the parking minimums currently in place within the UW parking impact area (as defined in the Municipal Code) to determine if they should be revised. Unbundled parking separates parking costs from total property cost, allowing buyers or tenants to forego buying or leasing parking spaces. These types of potential mitigation measures would tend to reduce the number of work-based commute trips and all types of home-based trips. Shopping-based trips would also decrease, but likely at a lower level since these types of trips are less sensitive to parking costs and limited supply for short-term use.

Incentive zoning provisions could also be explored to encourage developers to include parking spaces for car share and bike share programs. Site requirements could be modified to accommodate bike share stations on private sites in high demand areas. Bicycle share will launch in the U District in 2014 and more bike share stations will likely be added to the study area as demand and use increases. A more detailed review of the code would be required before setting specific recommendations for facilitation of bike share station siting. However, some regulatory sections for potential modification may include:

- Adding bike share stations as a “residential amenity” in the open space provisions;
- Floor Area Ratio (FAR) bonuses allowing bike share setback, listing bike share stations in the street improvement manual (as a “green street” improvement or separately); and

- Allowing modifications from landscaping setbacks to allow bike share stations, where appropriate.

The City could also consider encouraging parking operators, including UW, to upgrade their parking revenue control systems (PARC) to the latest technology so it could be incorporated into an electronic guidance system, such as the e-Park program that is currently operating Downtown. This technology would help direct drivers to off-street parking facilities with available capacity. An analogous approach for on-street parking—SF*park*—has been implemented in San Francisco. SF*park* uses sensors embedded in metered spaces to provide real-time data to drivers so they can find open spaces more easily and spend less time cruising for parking, thereby reducing congestion. The sensor data also allows the San Francisco Municipal Transportation Agency to periodically adjust parking pricing to match demand. In the absence of a new ITS parking program, the City would continue to manage on-street paid parking through SDOT's Performance-based Parking Pricing Program which evaluates data to determine if parking rates, hours of operation and/or time limits could be adjusted to achieve the City's goal of one to two available spaces per block face throughout the day.

In addition to the parking management strategies described above, the City of Seattle could also consider establishing an area-wide transportation management partnership organization to provide programs, services, and strategies to improve access to employment and residences while decreasing the SOV rate, particularly during peak periods. This could include integrated land use and transportation planning as well as partnerships with transit providers. Local Transportation Management Associations (TMAs) can provide some of these services. Programs like the state's Growth and Transportation Efficiency Center (GTEC) concept or the existing local Business Improvement Area (BIA) are possible models or future funding sources. The program could include features of relevant programs such as Seattle Center City's Commute Seattle, Whatcom County's SmartTrip or Tacoma's Downtown on the Go programs. The City could also work with UW to expand their existing TDM campus services to all UW-owned facilities in the study area.

Growth and Transportation Efficiency Center (GTEC)

GETC is an extension of the existing CTR program which engages residents and employers of all sizes though an area-wide approach

The City could consider updating municipal code and Director's Rules related to Transportation Management Plans required for large buildings to include TDM measures that are most effective in reaching the U District's mode share goal. This may include membership in a TMA and discounted or free transit passes and/or car share and bike share memberships. For residential buildings, the City could also consider extending the Transportation

Management Plans or requiring travel options programs (such as Green Trips in Oakland, CA and Residential Services in Arlington, VA).

SPECIFIC MITIGATION MEASURES AND RESULTS

As stated earlier, the specific mitigation projects listed in this document are illustrative only, and do not reflect the only way that the identified impacts could be mitigated. The following analysis of the effects of the proposed mitigation measures provides an example of how the impacts could be mitigated.

Impact 1: Under both rezone alternatives, there would be significant impacts to pedestrian and bicycle mobility.

Example Mitigation 1: To reduce the significance of this impact, it is recommended that the Pedestrian and Bicycle System mitigation measures be implemented.

Results: The Pedestrian and Bicycle System package was factored in at the trip generation level. Improving pedestrian and bicycle facilities generally increases the pedestrian and bicycle mode share. However, given the already high pedestrian and bicycle mode share in the U District, the increase is expected to be minimal, likely no more than a 1% increase. While this translates to more users, the benefit of the network improvement is expected to outweigh the modest increase in users by providing an improved, safer environment with better connections to the light rail station. Therefore, the magnitude of the impact is expected to decrease with mitigation to a less than significant level.

Impact 2: Under both rezone alternatives, there would be significant impacts to transit corridors.

Example Mitigation 2: To reduce the significance of this impact, the City could pursue the projects identified in the Speed and Reliability Improvements mitigation package. The TMP identifies specific locations for transit signal priority and transit only or BAT lanes within the U District which would function as part of larger citywide transit priority corridors. The TMP estimates travel time improvements of 15 to 20% depending on the corridor. These reductions were applied to the travel time forecasts to determine if they would fully mitigate the impacts.

Eastlake High Capacity Transit

The TMP considered three options for high capacity transit (HCT) between South Lake Union and the Roosevelt Neighborhood via Eastlake Avenue E: rail, bus rapid transit, or enhanced bus. Eastlake HCT would provide a superior quality of service between South Lake Union and the U District. Depending on the mode selected, the corridor is expected to draw between 4,300 and 10,700 net new weekday riders. This option would provide additional capacity across the University Bridge, which this analysis has shown is a bottleneck to the U District.

Results: Table 3.5–15 summarizes the transit travel time findings if the recommended speed and reliability investments are implemented along all the U District transit priority corridors identified in the TMP. Three corridors met the impact criteria under Alternative 1:

- Northbound 7th Avenue NE from NE 42nd Street to NE 45th Street
- Northbound University Bridge from Fuhrman Avenue E to NE Campus Parkway
- Northbound University Way NE from NE Pacific Street to NE 45th Street

The University Bridge is still expected to operate at LOS F even with mitigation. However, the speed and reliability improvements would reduce the travel time below that of the No Action Alternative, removing the impact.

Although specific projects have not yet been identified for 7th Avenue NE and University Way NE, the TMP could be amended to include mitigating projects if it becomes necessary. However, given that 7th Avenue NE is projected to operate at LOS C and fewer buses are expected to use that route once University Link opens, it may become apparent that this location does not require improvements in the future.

One corridor met the impact criteria under Alternative 2:

- Northbound University Bridge from Fuhrman Avenue E to NE Campus Parkway

As was the case for Alternative 1, the University Bridge is expected to operate at LOS F even with mitigation. However, the speed and reliability improvements would reduce the travel time below that of the No Action Alternative, removing the impact.

Impact 3: Under both rezone alternatives, there would be potential significant impacts to freight mobility.

Example Mitigation 3: As described previously, no travel time related freight impacts are expected. However, it should be noted that the Pedestrian and Bicycle System and Travel Demand Management mitigation measures would help to reduce automobile trip generation, freeing up more capacity for freight traffic. Moreover, SDOT has identified an ITS project on NE Pacific Street that would support traffic adaptive operations to support freight movement, with potential benefits to travel times along that major truck street.

The benefits of each mitigation measure package are evaluated for the transportation system under the action alternatives, as is customary in an EIS. It should be noted these measures would also provide benefits under the No Action Alternative, and may be implemented regardless of which alternative is ultimately selected.

The potential impacts relate to the adequate provision of loading zones and business access. These are project-level issues that cannot be addressed at this level of analysis. As specific projects seek a Master Use permit, the City would review the applications to ensure that adequate loading and truck circulation facilities are provided based on the proposed use.

Impact 4: Under both rezone alternatives, there are potential impacts to on-street parking supply within the U District, as well as spillover impacts into adjacent neighborhoods, including Roosevelt and University Park.

Example Mitigation 4: To reduce the significance of this impact, the City could monitor the parking occupancy and RPZs both in the study area and immediately adjacent to the study area. Potential mitigation could include splitting existing RPZs into multiple zones, adding new RPZs, or adjusting RPZ boundaries. Bikeshare and carshare parking incentives could be implemented through updates to the City municipal code to help mitigate impacts to areas in which RPZs are not feasible.

POTENTIAL MITIGATION MEASURE IMPLEMENTATION

Funding for mitigation projects could come from a variety of sources. One way to generate additional funding would be a voluntary impact fee program. Implementation of the potential mitigation measures described above could be at least partially achieved through a voluntary impact fee program. This type of program would require additional analysis before it could be implemented, and would only cover a portion of the projects listed above. As the U District neighborhood builds out, SDOT would monitor the transportation system, prioritize projects, and use the fees collected to construct projects, similar to the way the current South Lake Union Voluntary Impact Fee Program is operated.

Projects that develop within the U District may pay the voluntary mitigation fee in order to receive a Master Use Permit. Alternatively, if a project applicant does not wish to pay the voluntary impact fee, they would be required to perform a supplemental environmental analysis to determine transportation impacts and appropriate measures to mitigate project impacts.

Travel demand management, parking mitigation measures, and bikeshare and carshare parking incentives could be implemented through updates to the City municipal code.

Table 3.5–17: **Transit Travel Times — Mitigated Alternatives**

			No Action Alternative		Alternative 1		Alternative 2	
ID	**Road**	**Segment**	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
1	NE Ravenna Blvd	8th Ave NE to 15th Ave NE	Auto Corridor Only					
2	NE 50th St	Latona Ave NE to 5th Ave NE	Auto Corridor Only					
3	NE 50th St	5th Ave NE to Roosevelt Way NE	Auto Corridor Only					
4	NE 50th St	Roosevelt Way NE to 15th Ave NE	Auto Corridor Only					
5	NE 45th St	Latona Ave NE to 5th Ave NE	C / 1:42	C / 2:01	C / 1:42	C / 2:01	C / 1:42	C / 2:01
6	NE 45th St	5th Ave NE to Roosevelt Way NE	E / 1:46	**F / 2:11**	E / 1:46	**F / 2:11**	E / 1:46	**F / 2:11**
7	NE 45th St	Roosevelt Way NE to 15th Ave NE	C / 1:41	C / 2:49	C / 1:41	C / 2:49	C / 1:41	C / 2:48
8	NE 45th St	15th Ave NE to Montlake Blvd NE	Auto Corridor Only					
9	NE 40th St	2nd Ave NE to 9th Ave NE	C / 1:27	D / 4:22	C / 1:27	D / 4:22	C / 1:27	D / 4:22
10	NE Campus Pkwy	Roosevelt Way NE to 15th Ave NE	C / 1:00	C / 1:28	C / 0:48	C / 1:10	C / 0:48	C / 1:10
11	NE Pacific St/NE Northlake Wy	6th Ave NE to 15th Ave NE	D / 2:07	--	D / 2:07	--	D / 2:07	--
12	NE Pacific St	15th Ave NE to Montlake Blvd NE	D / 2:34	C / 1:44	C / 2:06	C / 1:25	C / 2:06	C / 1:25
13	7th Ave NE	NE 42nd St to NE 45th St	C / 1:27	--	C / 1:36	--	C / 1:29	--
14	Roosevelt Way NE	NE Ravenna Blvd to NE 50th St	--	C / 3:02	--	C / 2:26	--	C / 2:26
15	Roosevelt Way NE	NE 50th St to NE 45th St	--	D / 2:22	--	C / 1:53	--	C / 1:54
16	Roosevelt Way NE	NE 45th St to NE Campus Pkwy	--	D / 3:46	--	C / 3:02	--	C / 3:02
17	University Bridge	NE Campus Pkwy to Fuhrman Ave E	**F / 7:15**	E / 4:37	**F / 6:18**	D / 4:02	**F / 6:22**	D / 4:01
18	11th Ave NE	NE Ravenna Blvd to NE 50th St	E / 4:43	--	E / 3:46	--	E / 3:46	--
19	11th Ave NE	NE 50th St to NE 45th St	E / 2:40	--	D / 2:08	--	D / 2:08	--
20	11th Ave NE	NE 45th St to NE Campus Pkwy	D / 3:09	--	C / 2:32	--	C / 2:33	--
21	University Way NE	NE Ravenna Blvd to NE 50th St	E / 3:34	C / 2:17	E / 3:34	C / 2:17	E / 3:34	C / 2:17
22	University Way NE	NE 50th St to NE 45th St	D / 2:10	C / 1:05	D / 2:10	C / 1:05	D / 2:10	C / 1:05
23	University Way NE	NE 45th St to NE Pacific St	**F / 6:07**	E / 4:38	**F / 6:08**	E / 4:39	**F / 6:07**	E / 4:40
24	15th Ave NE	NE Ravenna Blvd to NE 50th St	D / 3:39	C / 2:36	C / 2:58	C / 2:06	C / 2:58	C / 2:06
25	15th Ave NE	NE 50th St to NE 45th St	E / 2:47	C / 1:39	D / 2:15	C / 1:20	D / 2:15	C / 1:20
26	15th Ave NE	NE 45th St to NE Pacific St	C / 5:30	C / 6:23	C / 4:27	C / 5:10	C / 4:27	C / 5:09

Source: Fehr & Peers, 2013

3.5.4 Significant Unavoidable Adverse Impacts

This section describes the significant and unavoidable adverse impacts to transportation that would occur as a result of implementation of the rezone alternatives.

The proposed mitigation packages would reduce the magnitude of all of the identified impacts of the rezone alternatives to a less-than-significant level. Therefore, there are no significant unavoidable adverse impacts to transportation.