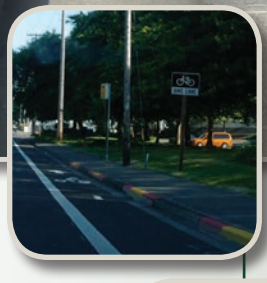
City of Tukwila

Background Report for the Transportation Element of the Comprehensive Plan Update

Transportation Analysis and 2030 Improvement Recommendations



FEHR PEERS

Draft Report

Submitted by:

Fehr & Peers
1001 - 4th Ave
Suite 4120
Seattle, WA 98154

Prepared for:

City of Tukwila
Department of Public Works
6300 Southcenter Blvd.
Tukwila, WA 98188

May 2012

City of Tukwila

Background Report for the Transportation Element of the Comprehensive Plan Update

Transportation Analysis and 2030 Improvement Recommendations

Prepared for:

City of Tukwila Public Works Department

Cyndy Knighton, Senior Transportation Engineer

6300 Southcenter Boulevard

Tukwila, WA 98188

DRAFT

Prepared by:
Fehr & Peers

1001 4th Avenue, Suite 4120
Seattle, WA 98154

May 2012

FEHR & PEERS

TABLE OF CONTENTS

APPENDICES

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

The Transportation Element of the City of Tukwila's Comprehensive Plan is used to ensure that adequate transportation infrastructure is provided to accommodate future land use growth as required by the Growth Management Act. An important component to fulfilling the transportation goals and policies outlined in the Transportation Element is an assessment of existing and future transportation system performance. This report highlights a multimodal assessment of existing and future transportation operations and suggests a list of recommended improvements to ensure that Tukwila's residents and visitors can conveniently access all areas in the City for years to come.

This Background Report is divided into two main parts: Existing Conditions and Future Conditions. The first part focuses on the existing conditions of Tukwila's transportation system and highlights how well the current system accommodates travel by bicycle, pedestrian, and automobile modes. As described in Chapter 2, Tukwila's transportation system generally accommodates auto travel well, with just a handful of locations operating at a poor automobile level of service (LOS). However, the pedestrian and bicycle modes are not well served, with many corridors in the city operating poorly.

In many ways, the existing performance of the transportation system reflects how performance has historically been evaluated—with a strong bias towards auto travel. A key feature of this new analysis is a focus on other modes, notably pedestrian and bicycle travel. While there are also means to assess transit LOS, this was not a focus of this analysis since the City of Tukwila does not have any control over transit service. This assessment uses the latest methodologies from the Transportation Research Board to assess multimodal level of service (MMLOS) and represents the first widespread use of this technique in the State of Washington. Through the application of the MMLOS method, the City has gained an understanding of its results and applicability, as well as its limitations. These limitations principally are 1) inability to consider urban form; 2) the lack of sensitivity to terrain; and 3) lack of consideration of other principal bicycle and/or pedestrian amenities. Given these limitations, the City should establish policy guidelines related to how the results of the MMLOS analysis should be interpreted.

The second part (Chapters 3-5) of this document focuses on future year automobile travel and LOS. MMLOS analysis was not performed under 2030 conditions since the MMLOS techniques are largely focused on the present physical conditions as opposed to future travel demands and therefore 2030 MMLOS conditions would be about the same unless there were major changes to the pedestrian and bicycle facilities.

Using the results of the existing conditions MMLOS and 2030 auto LOS analyses, a set of transportation system improvements was developed. Cost estimates and revenue projections were calculated and a final set of cost-constrained, prioritized multimodal projects was developed. The recommended transportation improvement project list in this report combines input from City staff, its consultants, the City's current Transportation Improvement Program, and the City's *Walk and Roll* nonmotorized transportation plan. It is expected that this list of projects will form the foundation for future transportation investments in the City.

This page intentionally left blank.

CHAPTER 1. INTRODUCTION

One of the most important, yet underappreciated elements of daily life is travel. People must travel to meet nearly every need: work, recreation and social activities, eating, and shopping. The fact that mobility affects quality of life and economic vitality is barely noticed until travel becomes difficult. To meet this need for mobility, the City of Tukwila plans, develops, and maintains the transportation network in the City. The transportation system includes everything from roadways and sidewalks, to bicycle lanes and trails. In addition, the City works in conjunction with other agencies like the Washington State Department of Transportation and King County Metro to provide connections to the regional highway system and services like public transit. Ultimately, Tukwila is committed to providing a transportation system that is efficient, convenient, and safe for all users.

Tukwila's Vision for Transportation

Given the importance of travel, a long range vision for the transportation system is critical to ensure that future residents of Tukwila have good access to jobs, services, and recreation. The Transportation Element of Tukwila's Comprehensive Plan represents the City's vision for transportation. The Transportation Element identifies goals and policies to help achieve that vision and it also defines a transportation funding program for implementation.

The last update of the Transportation Element occurred in 2005. Since that time, a number of major roadway projects from the previous plan were completed, Sound Transit commenced Link Light Rail service in the city, the economic climate in the region has changed, and the Tukwila South area has been annexed. Considering all these changes, the City determined that it was time to update the Transportation Element.

In addition to updating the Transportation Element to reflect the changes above, it is the goal of the City to incorporate a more multi-modal emphasis in the Transportation Element. A key element of this approach is the implementation of a "Complete Streets" concept where travel by all modes—walking, bicycling, transit, and cars/trucks—is accommodated throughout Tukwila.

Background Report

As a basis for updating the Transportation Element of the Comprehensive Plan, Fehr & Peers has prepared this Background Report. The intent of the Background Report is to provide the technical details to assist City staff and decision makers in identifying and prioritizing the transportation capital project needs. These new transportation projects will provide the infrastructure necessary to accommodate the next 20 years of growth in the City and will also help Tukwila's transportation network mature into a more multimodal system. The Background Report covers all modes of transportation that are provided in the City. However, as transit services are provided by King County Metro and Sound Transit, the report does not include extensive evaluation of transit services in the City.

To facilitate project identification, the Background Report includes the following:

- An inventory and description of the existing transportation system for all modes (pedestrian, bicycles, roads, and transit)
- Existing conditions level of service analysis for pedestrians, bicycles, roadways, and intersections.
- Forecasts of future traffic growth and its impacts to the transportation network in Tukwila.
- Assessment of how future traffic growth might impact the ability to meet concurrency requirements.

- Transportation improvement projects identified as needed to satisfy City's concurrency standards.
- Integration of the bicycle and pedestrian projects identified in the Walk and Roll Plan.
- Descriptions of recommended transportation projects.
- Project prioritization framework.
- A strategy that identifies funding resources for prioritized projects.

In addition to providing technical information to help identify and prioritize potential projects, it is envisioned that the Background Report will assist the City in developing the Capital Improvement Program and the Transportation Improvement Program. Also, information in the Background Report can be used for applying for various Federal and State grants.

CHAPTER 2. EXISTING TRANSPORTATION CONDITIONS

As part of developing a comprehensive transportation network for the City of Tukwila, it is important to understand the existing conditions of the transportation system. The most recent Transportation Element was updated as a part of the Comprehensive Plan update in 2005. Since that time there have been several major changes in Tukwila, including the approval and annexation of Tukwila South, a major development area along Southcenter Parkway south of S 180th Street and substantial retail development in the Southcenter area. The purpose of this chapter is to document how the changes to local and regional land use patterns have affected the transportation system as of 2011. This chapter summarizes the current operations of the transportation network for all modes: vehicles, pedestrians, bicycles, and transit.

STUDY AREA

The study area is the entire City of Tukwila, as shown in **Figure 1**. In some cases, the analysis is focused on the Southcenter area of the City, which is defined as the area bounded by I-405 to the north, S 180th Street to the south, I-5 to the west and SR 181 (W Valley Highway) to the east. Much of the future residential and employment growth within Tukwila is planned for this area, and it has unique traffic characteristics due to the concentration of commercial activity.

STREET CLASSIFICATION

The roadway network within the City of Tukwila is composed of freeways, principal, minor, and collector arterials, and local access streets as shown in **Figure 2**. North/south freeways include Interstate 5 (I-5), State Route (SR) 599 and a portion of SR 99. East-west freeways include I-405 which runs east from I-5 into Renton and SR 518, which serves as a westerly extension of I-405 between I-5 and Burien. **Figure 3** displays the speed limits along the main roadways within Tukwila. Although not exhaustive, the following list summarizes the main arterials throughout the city.

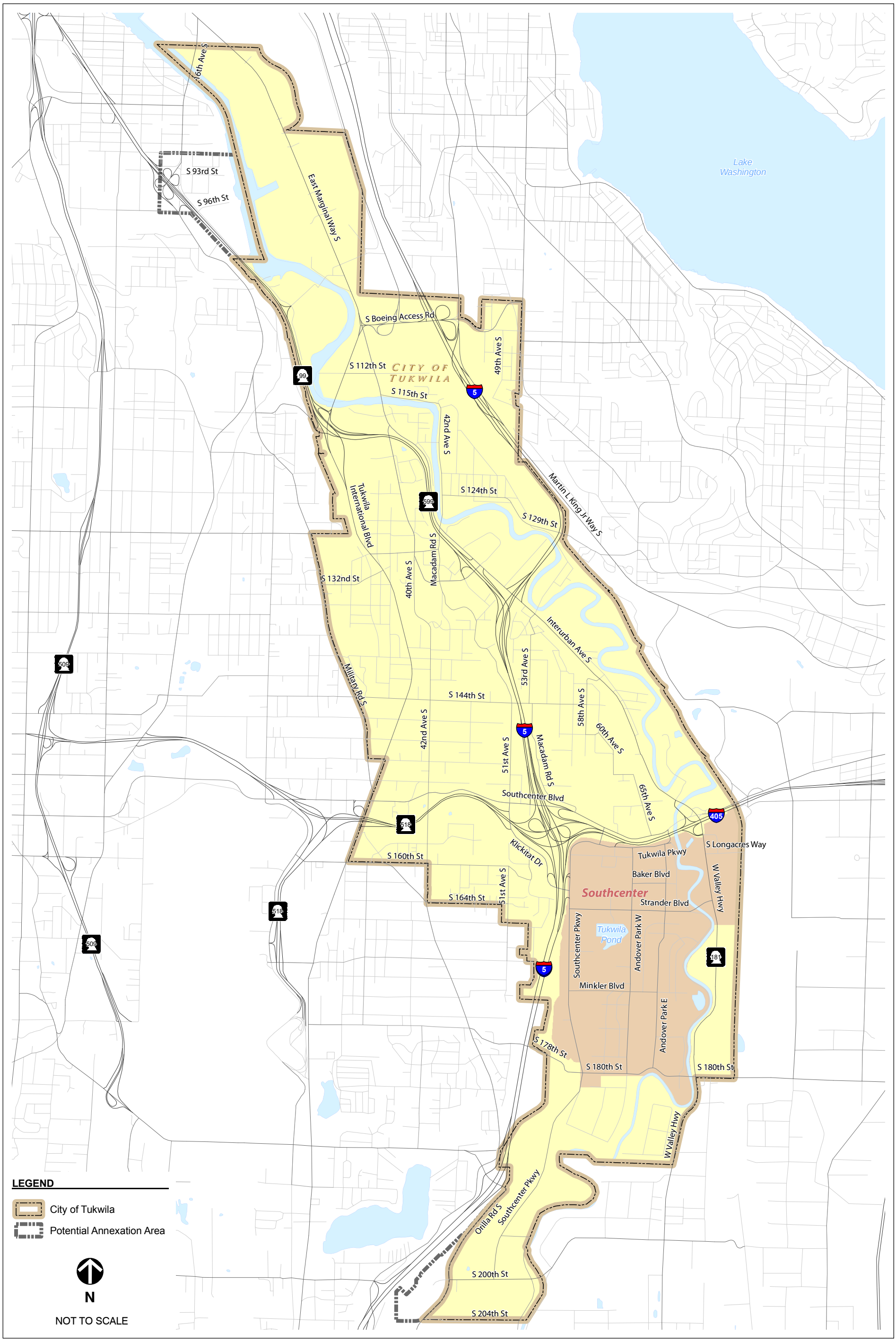
North/South Arterials

The following arterials run through Tukwila:

- East Marginal Way S (principal and minor arterial)
- Martin Luther King Jr. Way S (principal arterial)
- Tukwila International Boulevard/Pacific Highway S (principal arterial)
- W Valley Highway (principal arterial/state route)
- Klickitat Drive (minor arterial)
- Southcenter Parkway (minor arterial)
- Andover Park West (minor arterial)
- Andover Park East (minor arterial)

East/West Arterials

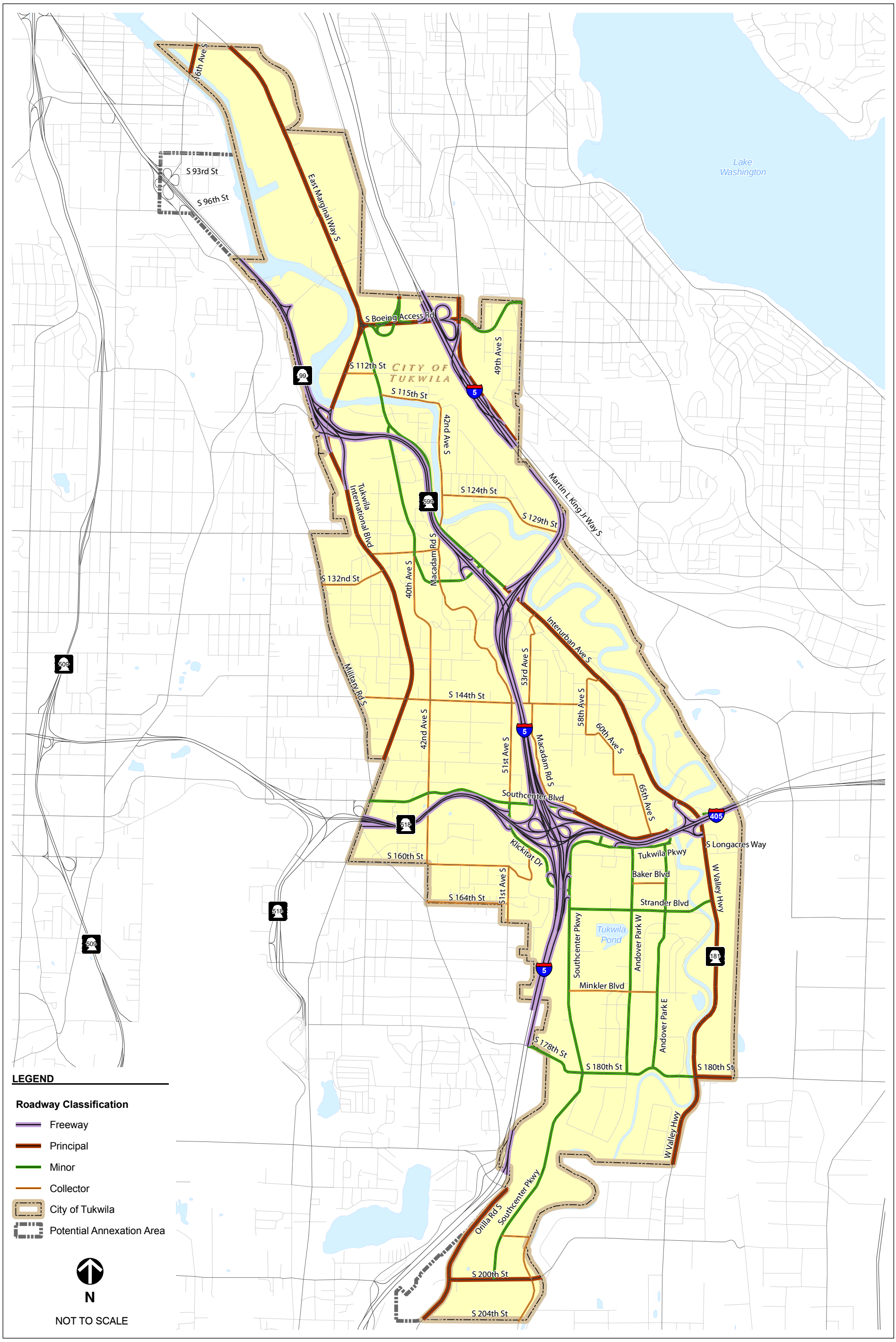
- S Boeing Access Road (principal arterial)
- Southcenter Boulevard (principal and minor arterial)
- Tukwila Parkway (minor arterial)
- Strander Boulevard (minor arterial)
- S 180th Street (principal and minor arterial)



FEHR PEERS

CITY OF TUKWILA - STUDY AREA

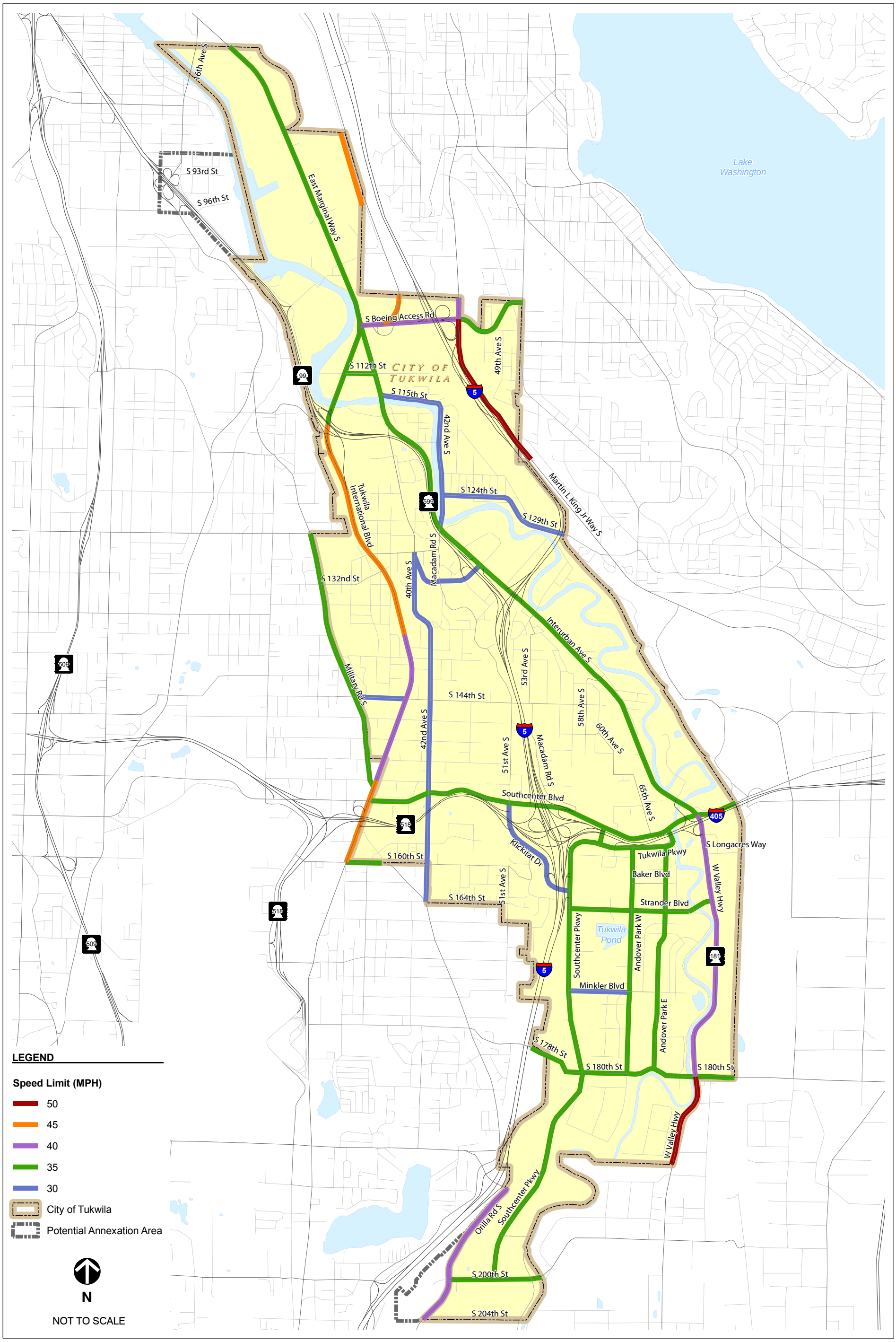
FIGURE 1



FEHR PEERS

CITY OF TUKWILA - ROADWAY CLASSIFICATION

FIGURE 2



FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig03_speed.mxd

CITY OF TUKWILA - SPEED LIMITS

FIGURE 3

PEDESTRIAN AND BICYCLE FACILITIES

In January 2009, Tukwila completed an extensive study of the City's pedestrian and bicycle systems and summarized the findings in *Walk and Roll*, which is the City's non-motorized transportation plan. Based on the data in the *Walk and Roll* plan, **Figure 4** displays the existing pedestrian and bicycle facilities along arterial[1] streets in Tukwila and **Figure 5** shows the City's designated bicycle friendly routes. The City has recommended a comprehensive network of bicycle friendly routes, but only a small portion of those routes currently have facilities such as bike lanes. As capital improvement projects occur along these routes, the City plans to incorporate bike lanes. Sidewalks exist along most arterials, but there are some gaps, especially outside of Southcenter, the City's urban center. Some arterials have paved shoulders rather than sidewalks. Many residential neighborhoods have gaps between pedestrian facilities. In some areas, the existing pedestrian and bicycle facilities do not meet current City standards. However, these non-standard areas are not shown on **Figure 4**.

TRANSIT

Transit service in the City of Tukwila is provided by King County Metro and Sound Transit. **Figure 6** depicts transit routes and facilities within the study area.

Sound Transit

Sound Transit's Link light rail line has one station within Tukwila located on International Boulevard and Southcenter Boulevard/S 154th Street near the SR 518 interchange. Trains currently operate between the Sea-Tac Airport station and Westlake Station in Downtown Seattle. Trains run from approximately 5 AM to 1 AM Monday through Saturday and 6 AM to midnight on Sundays and holidays. Headways are shown in **Table 1**.

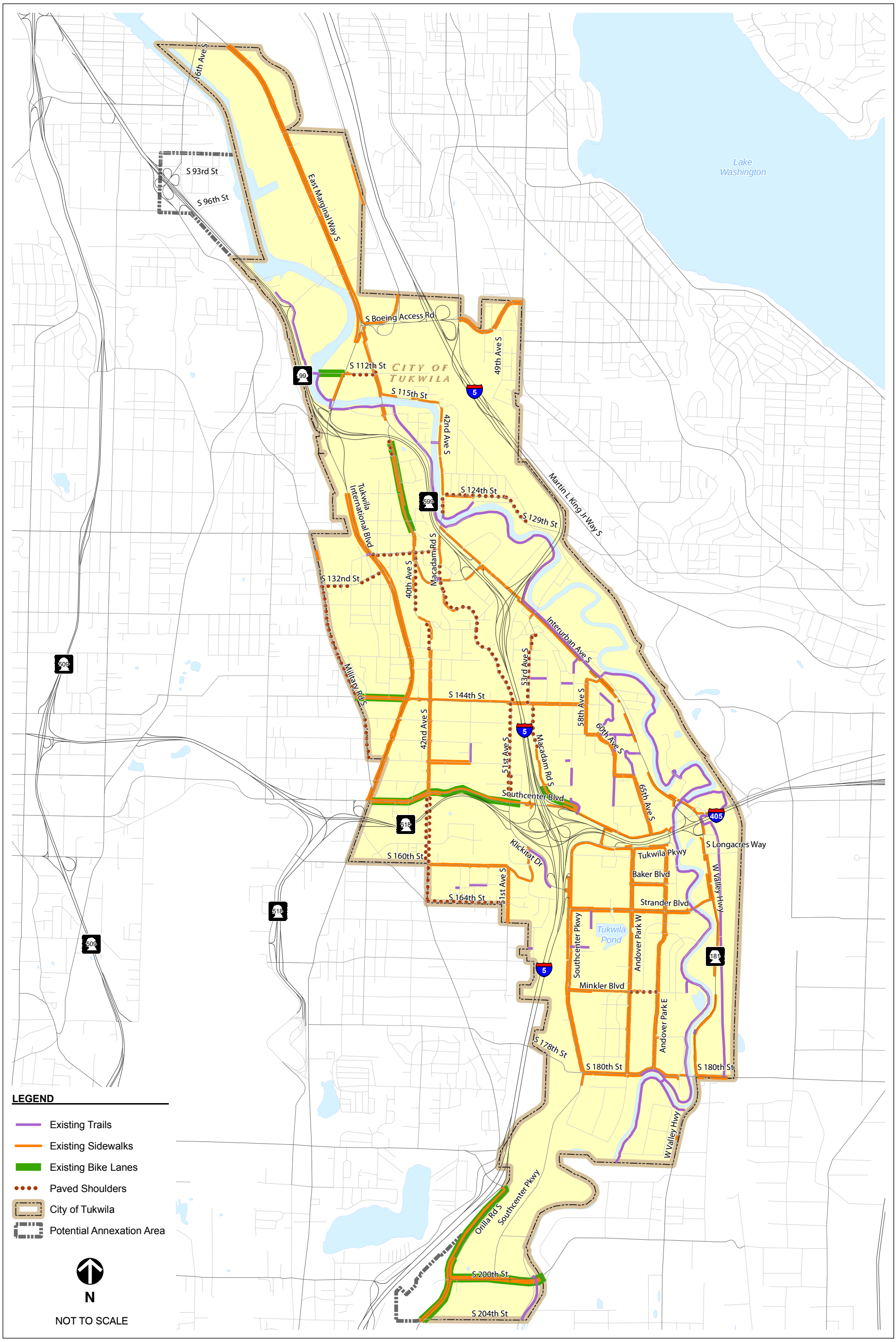
TABLE 1 – SOUND TRANSIT LINK LIGHT RAIL HEADWAYS

Weekdays		Weekends & Holidays	
Time	**Headway in Minutes**	**Time**	**Headway in Minutes**
5:00 AM – 6:00 AM	15	5:00 AM – 6:00 AM (Saturday only)	15
6:00 AM – 8:30 AM	7.5	6:00 AM – 8:00 AM	15
8:30 AM – 3:00 PM	10	8:00 AM – 10:00 PM	10
3:00 PM – 6:30 PM	7.5	10:00 PM – midnight	15
6:30 PM – 10:00 PM	10	Midnight – 1:00 AM (Saturday only)	15
10:00 PM – 1:00 AM	15		

Sound Transit, 2010.

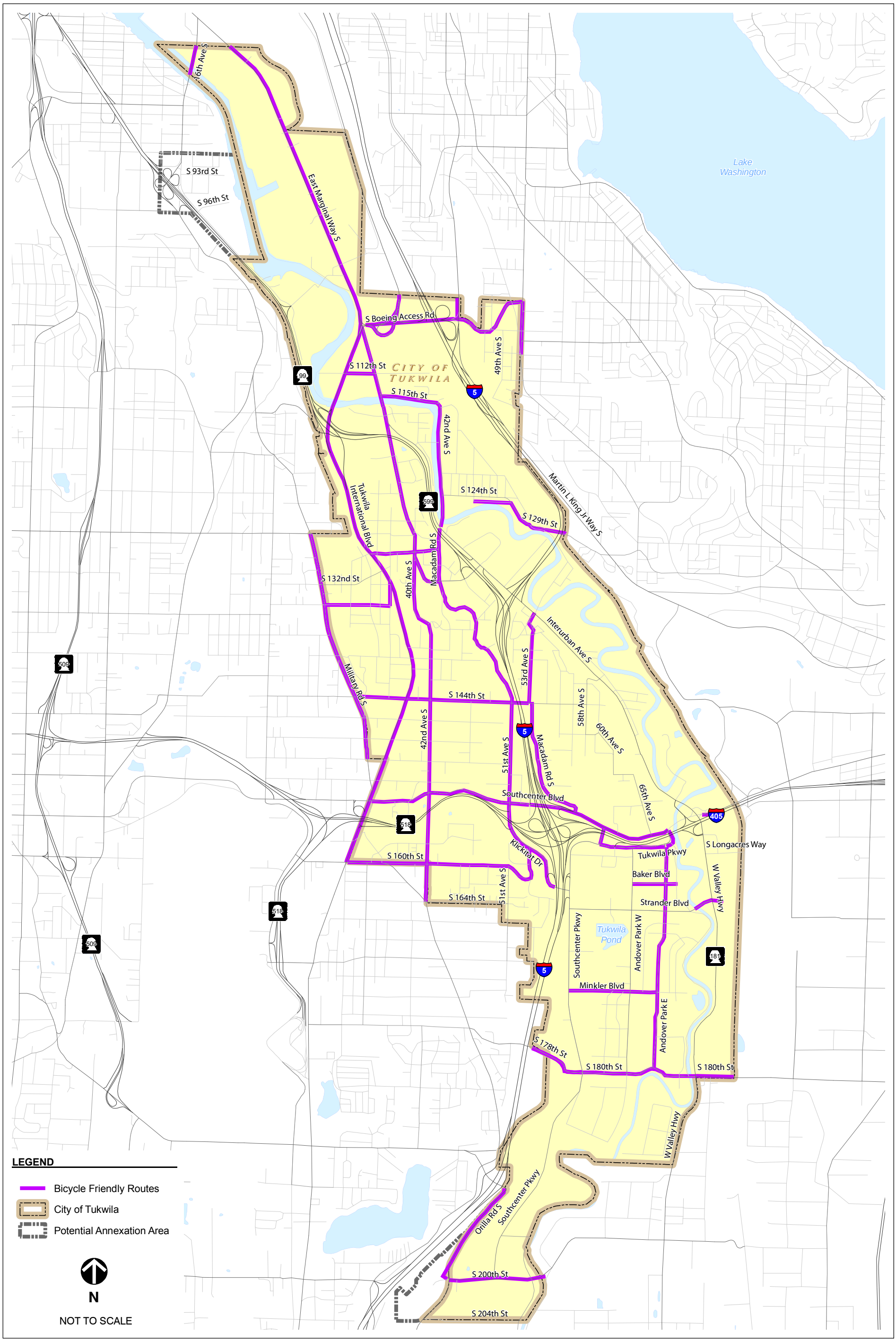
Sound Transit also runs the Sounder commuter train between Tacoma and Everett on weekdays. The train stops at the Tukwila Station located at S Longacres Way just east of W Valley Highway and south of I-405. The current station is temporary and will be replaced with a larger station in the future. Seven trains

[1] The Walk and Roll plan considered streets other than arterials; however Figure 4 focuses only on the facilities present on the arterial street system.



FEHR & PEERS

CITY OF TUKWILA -
EXISTING PEDESTRIAN AND BICYCLE FACILITIES
FIGURE 4

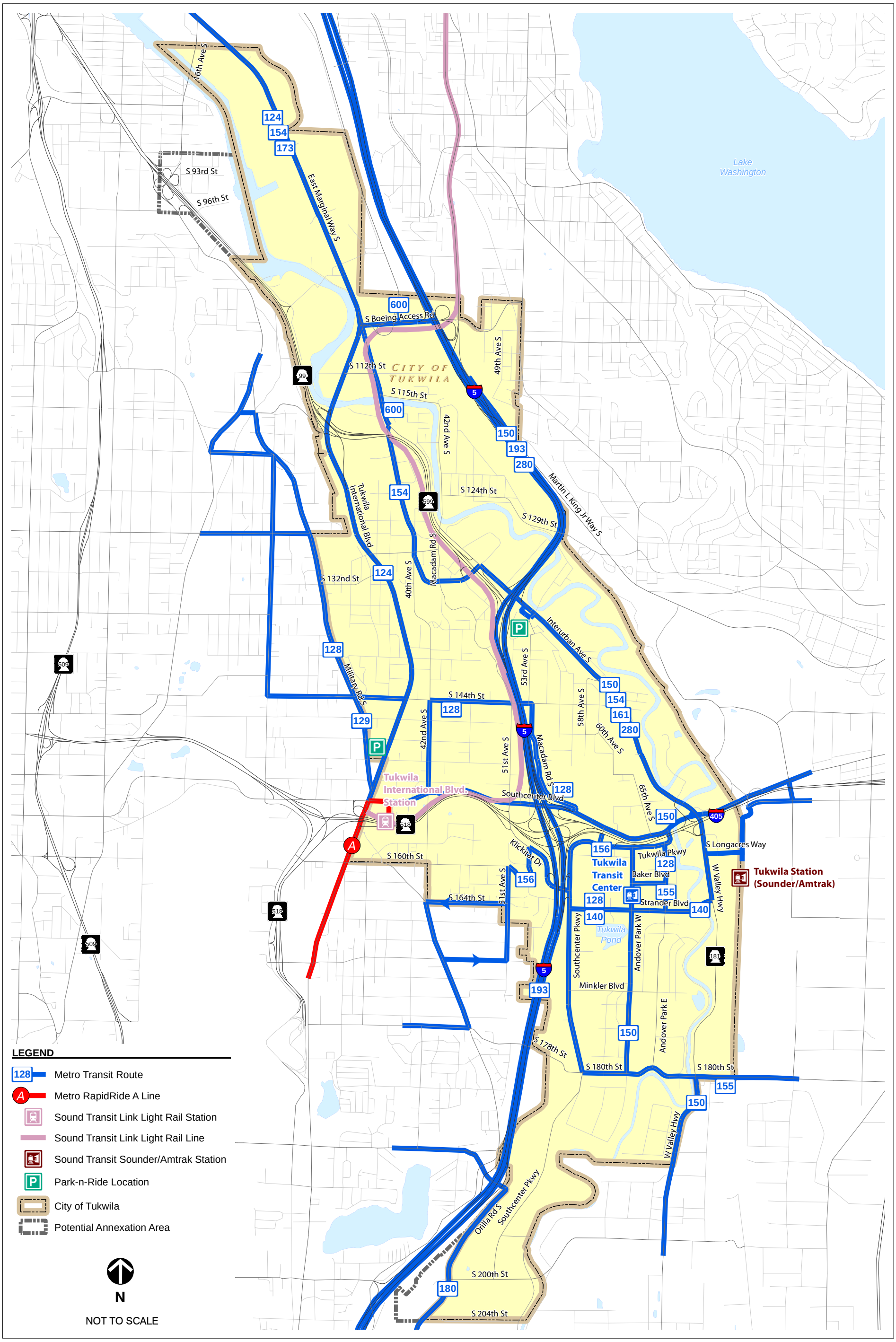


FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.01_Tukwila PedBike LOS\Graphics\Draft\GIS\MXD\fig05_bike_frd_routes.mxd

CITY OF TUKWILA - DESIGNATED BICYCLE FRIENDLY ROUTES

FIGURE 5



FEHR PEERS

\\Fpse03\fpse2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig06_transit_temp.mxd

CITY OF TUKWILA - EXISTING TRANSIT ROUTES AND FACILITIES

FIGURE 6

run northbound in the morning and southbound in the afternoon and two trains run southbound in the morning and northbound in the afternoon. Amtrak inter-city service also serves Tukwila Station. Several Sound Transit Express buses have stops close to Tukwila (such as at Sea-Tac airport), but not within the city limits.

King County Metro

The Southcenter area of the City is served by King County Metro transit routes reaching West Seattle, Downtown Seattle, Burien, Kent, and Renton. The routes, neighborhood destinations, and headways are shown in **Table 2**. Headways for all five lines remain the same throughout the day. All lines with the exception of Route 155 operate every day of the week. Route 155 does not operate on Sundays.

TABLE 2 – SOUTHCENTER KING COUNTY METRO BUS ROUTES

Route	Destinations	Headway in Minutes (6 AM – 6 PM)
128	Admiral District, West Seattle Junction, Delridge, South Seattle Community College, White Center Transfer Point, Highline Specialty Medical Center, Riverton Heights, Tukwila International Blvd Station, and Southcenter	30
140*	Burien Transit Center, Riverton Heights, Tukwila International Blvd Station, Southcenter, Tukwila Station, South Renton Park & Ride, and Renton Transit Center	15
150	Downtown Seattle Transit Tunnel, Stadium Station, SoDo, SoDo Station, Tukwila Park & Ride, Southcenter, Kent Boeing, Regional Justice Center, and Kent Station	15
155	Fairwood, Cascade Vista, Valley Medical Center, and Southcenter	60
156	Sea-Tac, McMicken Heights, Southcenter, and Tukwila Station	30

Source: King County Metro, 2010.
Note: *Route 140 will be replaced with the RapidRide F Line in September 2013.

Additional routes serving Tukwila outside of Southcenter are summarized in **Table 3**. Several of these routes have peak periods outside the typical 6-9 AM and 3-6 PM (for example, Route 124 is geared toward early morning Boeing shifts). In addition, several routes run only in the peak direction. Headways shown in **Table 3** are for each route's peak direction during its peak period. Route 124 runs every day of the week. All remaining routes run only on weekdays and Route 280 is a "night owl" bus.

TABLE 3 – TUKWILA KING COUNTY METRO BUS ROUTES

Route	Destinations	AM Headway in Minutes	PM Headway in Minutes
124	Downtown Seattle, SoDo, Georgetown, Duwamish Boeing, Riverton Heights, and Tukwila Link Station	18	20
129	Boulevard Park, Riverton Heights, and Tukwila Link Station	37	38
154	Federal Center South, Duwamish Boeing, Tukwila Park & Ride, and Tukwila Sounder Station	39	38
161	Lake Meridian Park & Ride, Glencarin, Kent East Hill, Valley Medical Center, Tukwila Park & Ride, and Downtown Seattle	34	33
193	First Hill Express-Swedish (Cherry Hill) Medical Center, Harborview Hospital, Swedish Hospital, Virginia Mason Hospital, Tukwila Park & Ride, Star Lake Park & Ride, Kent-Des Moines Park & Ride	24	30
280	South Renton Park & Ride, Tukwila, SoDo, Downtown Seattle, Bellevue Transit Center, Coal Creek Parkway Freeway Station, Kennydale, and Renton.	75*	
600	Downtown Seattle, and Group Health Cooperative	20	24

Source: King County Metro, 2010.
Note: *Route 280 is a night owl bus, running from approximately 2:00 - 4:30 AM.

The Tukwila Link Station is the terminus for Metro's new *RapidRide A Line*, a bus rapid transit route that began service on October 2, 2010. The line runs south to Federal Way along Pacific Highway S (International Boulevard) and reaches the following destinations: McMicken Heights, Sea-Tac, Midway, Redondo Heights Park and Ride, Federal Way Transit Center, and the Federal Way/S 320th Street Park and Ride. The *A Line* runs every day of the week from 4:15 AM to 10:00 PM. Weekday headways between 7:00-9:00 AM and 2:00-6:00 PM are 10 minutes. All other hours of service operate at 15 minute headways with the exception of 4:15-4:45 AM on weekends and holidays which operates at 30 minute headways.

Tukwila Transit Master Plan

In April 2005, Tukwila adopted the Transit Master Plan, which is a component of the Comprehensive Plan Update. The goal was to improve and maximize usage of all transit service in the area, make service faster, more effective, and help Tukwila meet its development potential. The report identified approaches to improving system ridership, cost effectiveness, and cost efficiency. It determined a future route network to meet anticipated demand for service.

Park and Ride Lots

Five park and ride lots serve the City of Tukwila. The locations and number of spaces are listed below.

- Tukwila International Boulevard Station – 600 spaces
- Tukwila Surface Lot at Tukwila Station – 208 spaces
- Tukwila Park & Ride main lot at Interurban Avenue S/I-5 interchange – 255 spaces
- Tukwila Park & Ride auxiliary lot at Interurban Avenue S/I-5 interchange – 41 spaces
- The Church by the Side of the Road at Tukwila International Boulevard/S 148th Street – 28 spaces

The King County Metro Park and Ride Utilization Report provides an indication of the typical occupancy of Tukwila's lots, as shown in **Table 4**. Lots with at least 80 percent utilization are considered "high utilization" lots by King County Metro. Three of Tukwila's park and ride lots met the high utilization criteria in the fourth quarter of 2010: Tukwila International Blvd Station (98 percent), Tukwila Surface Lot (90 percent), and the Tukwila Park & Ride auxiliary lot (95 percent). Of all 131 lots countywide, 46 met the high utilization criteria (35 percent). In the fourth quarter of 2009, the Tukwila Park & Ride main lot also exceeded 80 percent. The Church by the Side of the Road park and ride lot is the smallest in Tukwila as well as the least used.

TABLE 4 – TUKWILA PARK AND RIDE LOT UTILIZATION

Lot Location	Capacity	2009 Fourth Quarter Utilization	2010 Fourth Quarter Utilization
Tukwila International Blvd Station	600	80%	98%
Tukwila Station	208	80%	90%
Tukwila Park & Ride main lot	255	95%	76%
Tukwila Park & Ride auxiliary lot	41	100%	95%
The Church by the Side of the Road	28	18%	17%

Source: King County Metro, 2011.
Note: Monthly counts taken by Metro and Sound Transit staff are averaged to calculate quarterly utilization.

FREIGHT AND HEAVY RAIL TRANSPORTATION

Train Volumes

Railroad tracks owned by the Burlington Northern Santa Fe (BNSF) and Union Pacific (UP) run north/south through Tukwila. These rail networks carry international and domestic cargo to inland markets and serve the Port of Seattle to the north and the Port of Tacoma to the south. BNSF has a multi-modal storage yard in the manufacturing and industrial area in northern Tukwila. BNSF operates approximately 35 trains per day through Tukwila, and Union Pacific operates approximately 16.[2] Both Amtrak and Sound Transit's Sounder Commuter Rail use the BNSF tracks. Amtrak runs 10 passenger trains per day, and Sound Transit runs 18 commuter trains each weekday.

Existing Railroad Rights of Way

Railroad ownership generally falls into one of two categories:

1. Mainlines that are operated and controlled by the railroad company, the State Department of Transportation and the Interstate Commerce Commission.
2. Industrial Spurs that are operated and controlled by the railroad company and private property owners

BNSF and UP both operate on mainline tracks along the eastern edge of the City. A number of industrial spur lines traverse the Southcenter area, including two north/south lines east of Andover Park East and

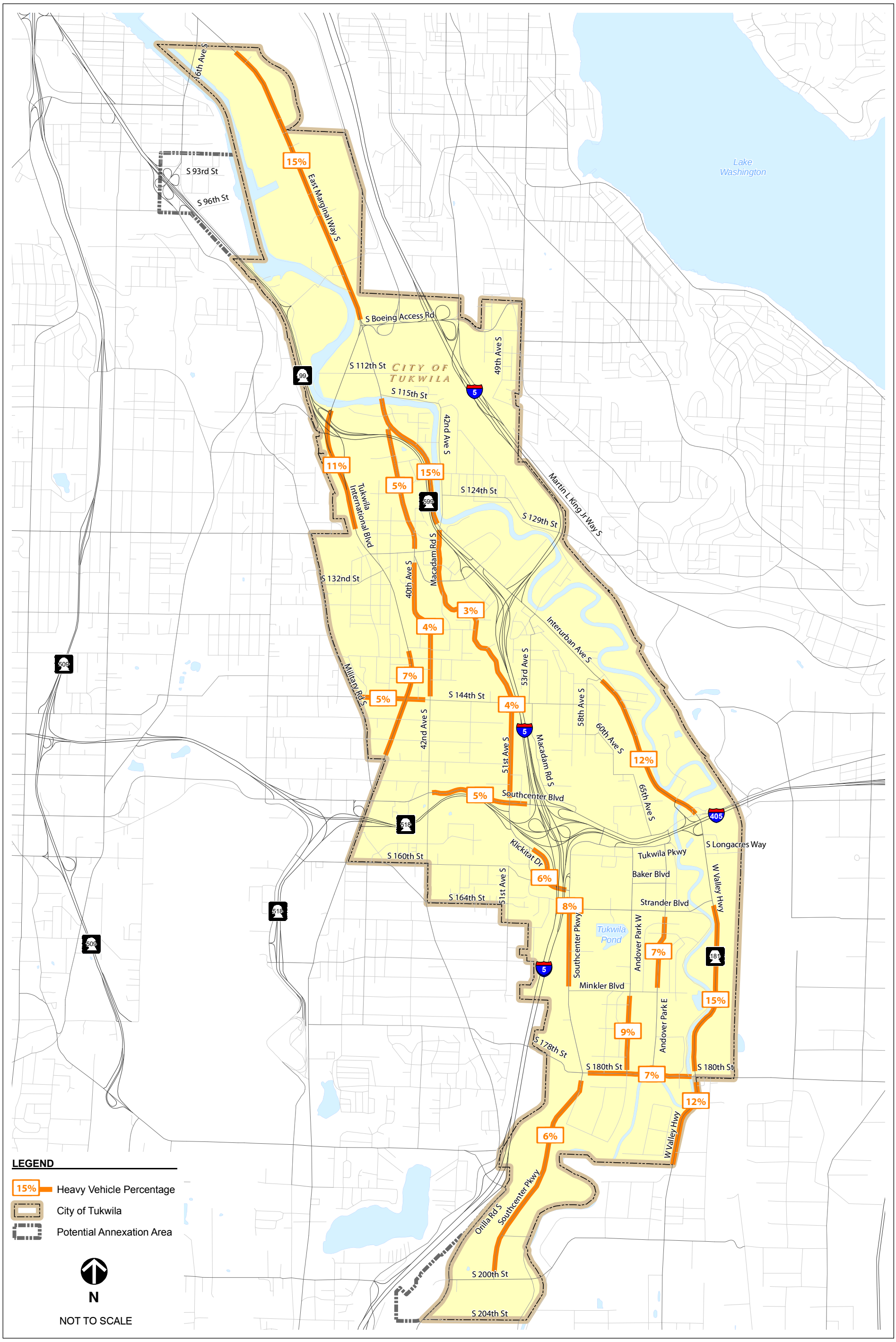
[2] Federal Railroad Administration, 2010.

Andover Park West and three shorter north/south lines in the blocks between Minkler Boulevard and Triland Drive and Southcenter Parkway and Andover Park West. The east/west spurs provide access from the mainline to the vicinity of the Tukwila Pond Park, south of Strander Boulevard, and also parallel Minkler Boulevard and S 180th Streets between Southcenter Parkway and Andover Park West.

In December 1993, the City of Tukwila commissioned a report on the feasibility of converting certain railroad corridors within the Southcenter area to a multi-purpose pedestrian/bicycle trail system. That study (prepared by MacLeod Reckord) reported that ownership of rights of way along the railroad spur lines must be determined through a title search in order to be fully accurate. Additional information is available through the King County Assessor's Office, which sometimes includes references to rights of way or easements on specific tax parcels. In general, it remains the City's intent to convert abandoned rail spurs onto multi-use trails as the land uses in Southcenter transition over time.

Truck Transportation

Given Tukwila's location at the crossroads of two major interstate highways, and the prevalence of manufacturing, warehousing, and commercial activities in the City, many streets experience high truck volumes. **Figure 7** displays the daily proportion of truck traffic on key streets in Tukwila. The segments with the highest truck percentage, 15 percent, are W Valley Highway south of Stander Boulevard, Interurban Avenue S north of SR 509, and E Marginal Way S north of Boeing Access Road.



FEHR PEERS

CITY OF TUKWILA -
HEAVY VEHICLE PERCENTAGES
FIGURE 7

TRANSPORTATION SAFETY

The City of Tukwila provided collision data on city-owned streets for a six year span between 2004 and 2009 for the following analysis. During this period, the Tukwila police department received reports of 1,409 collisions. These collisions resulted in four fatalities, 372 injuries, and 1,077 property-damage only (PDO) collisions. **Tables 5** and **6** summarize the number of collisions occurring at each roadway segment and intersection for those locations that fell above the citywide average collision rate[3].

As shown in the **Table 5**, the citywide average collision rate for roadway segments is 1.63 collisions per million vehicle miles of travel (MVMT). In comparison, the *2009 Washington State Collision Data Summary* (WSDOT 2010) found the statewide urban area average collision rate to be 2.03 collisions per MVMT and the King County average collision rate to be 2.17 collisions per MVMT. **Table 6** shows the Tukwila citywide average intersection collision rate is 0.40 collisions per million entering vehicles (MEV). WSDOT does not publish intersection collision rates.

The collision data indicated that there was a collision involving a fatality at each of the following study locations over the six year analysis period:

- The intersection of S 124th Street & 42nd Avenue S
- Along Interurban Avenue S between Southcenter Boulevard and 58th Avenue S (midway between Southcenter Boulevard and I-5)
- Along E Marginal Way S between S 130th Street and S 128th Street

[3] Collision rates were calculated on 23 roadway segments and at 51 intersections by dividing the total number of collisions per facility by the total traffic flow at the facility over the six year analysis span. Six year average traffic flows were estimated using 2009 PM peak hour traffic volumes and peak hour-daily and daily-annual conversion factors. This analysis assumes no change in traffic flow over the past six years, which is reasonable given the historical traffic trends discussed in the next section. Citywide average collision rates were calculated based on the volume-weighted collision rates for both intersections and roadway segments.

TABLE 5 – ROADWAY SEGMENTS WITH ABOVE CITYWIDE AVERAGE COLLISION RATES

Location	Crashes	Fatalities	Injuries	PDOs[1]	ADT[2]	Collision Rate[3]
Andover Park W from Strander Boulevard to Baker Boulevard	64	0	15	50	11,563	6.80
42nd Avenue S from S 164th Street to S 160th Street	26	0	9	17	6,620	4.27
Andover Park E from Strander Boulevard to Minkler Boulevard	47	0	18	32	11,915	3.74
Macadam Road S from Southcenter Boulevard to S 152nd Street	16	0	2	14	3,210	3.00
Andover Park E from Strander Boulevard to Baker Boulevard	28	0	3	25	11,642	2.84
S Boeing Access Road from E Marginal Way S to I-5	90	0	20	72	28,409	2.51
Andover Park W from S 180th Street to Triland Drive	19	0	6	14	9,780	1.83
Interurban Avenue S from Southcenter Boulevard to 58th Avenue S	74	1	14	61	20,170	1.64

Notes: The citywide average roadway segment collision rate is 1.63 collisions per million vehicle miles of travel. The statewide urban average collision rate is 2.03 collisions per MVMT and the King County average collision rate is 2.17 per MVMT.

[1] PDO = property damage only

[2] ADT = average daily traffic (weekdays)

[3] Collision Rate = roadway segment collision rate per million vehicle miles of travel

Source: Tukwila Police Department, 2010.

TABLE 6 – INTERSECTIONS WITH ABOVE AVERAGE COLLISION RATES

ID	Location	Crashes	Fatalities	Injuries	PDOs[1]	ADT[2]	Collision Rate[3]
32	Tukwila Parkway & Andover Park E	44	0	14	32	19,640	1.06
55	S 144th Street & 42nd Avenue S	24	0	5	19	11,610	0.98
16	Strander Boulevard & Andover Park W	54	0	10	44	27,910	0.92
58	S 144th St & Macadam Road S	9	0	1	8	5,040	0.85
88	S Boeing Access Road & Martin Luther King Jr. Way S	77	0	23	56	45,520	0.80
34	Southcenter Boulevard & W Valley Highway	103	0	26	77	61,080	0.80
23	Baker Boulevard & Andover Park W	27	0	9	19	17,640	0.72
86	S Boeing Access Road & E Marginal Way S	55	0	7	48	37,980	0.69
31	Tukwila Parkway & Andover Park W	30	0	15	20	21,400	0.66
90	S 102nd Street & E Marginal Way S	26	0	8	18	18,650	0.66
17	Strander Blvd & Andover Park E	37	0	5	32	27,270	0.64
87	S Boeing Access Road & I-5 SB Off-ramps	43	0	15	29	32,790	0.62
67	Interurban Avenue S & Gateway Drive	30	0	10	21	23,720	0.60
65	Interurban Avenue S & 48th Avenue S	20	0	5	16	16,960	0.56
35	W Valley Highway & I-405 SB Ramps	37	0	10	28	31,580	0.55
70	S 124th Street & 42nd Avenue S	9	1	1	7	7,790	0.55
47	S 160th Street & 42nd Avenue S	9	0	2	7	8,060	0.53
57	S 144th Street & 53rd Avenue S	6	0	0	6	6,190	0.46
21	Klickitat Drive & Southcenter Parkway	33	0	3	30	35,020	0.45
75	S 130th Street & Macadam Road S	3	0	1	2	3,410	0.42

Notes: The citywide average intersection collision rate is 0.40 collisions per million entering vehicles (MEV).

[1] PDO = property damage only

[2] ADT = average daily traffic (weekdays)

[3] Collision Rate = intersection collision rate per million entering vehicles

Source: Tukwila Police Department, 2010.

The project team also reviewed collisions between vehicles and pedestrians and between vehicles and bicycles. **Tables 7** and **8** summarize the intersection and roadway segment locations where pedestrian and bicycle collisions occurred during the 2004-2009 study period. Count data of a typical weekday's total AM and PM peak hour pedestrian and bicycle crossings are included to give a general indication of the level of pedestrian and bicycle activity at each intersection. Note that the collisions did not necessarily occur during a peak hour. This data provides context to the number of collisions recorded in the past six years. Busier intersections are more likely to have collisions due to the increased number of potential auto/pedestrian/cyclist conflicts. Pedestrian and bicycle flow data were not available along the roadway segments.

TABLE 7 – INTERSECTION PEDESTRIAN AND BICYCLE COLLISION ANALYSIS (2004-2009)

ID	Location	2004-2009 Pedestrian/Cyclist Collisions	Total Daily AM & PM Peak Hour Pedestrian & Bicycle Crossings[1]
23	Baker Boulevard & Andover Park W	3	164
67	Interurban Avenue S & Gateway Drive	2	30
62	Interurban Avenue S & 52nd Avenue S	1	157
55	S 144th Street & 42nd Avenue S	1	136
16	Strander Boulevard & Andover Park W	1	80
92	S 96th Place & E Marginal Way S	1	69
93	S 124th Street & E Marginal Way S	1	51
3	S 180th Street & Andover Park E	1	22
35	W Valley Highway & I-405 SB Ramps	1	19
94	S 150th Street & 42nd Avenue S	1	17
90	S 102nd Street & E Marginal Way S	1	16
24	Baker Boulevard & Andover Park E	1	15
11	Minkler Boulevard & Andover Park E	1	13
21	Klickitat Drive & Southcenter Parkway	1	12
57	S 144th Street & 53rd Avenue S	1	10
31	Tukwila Parkway & Andover Park W	1	7
75	S 130th Street & Macadam Road S	1	7
34	Southcenter Boulevard & W Valley Highway	1	4
32	Tukwila Parkway & Andover Park E	1	3

[1] Pedestrian and bicycle counts were collected in Summer 2009. They represent the total pedestrian and bicycle crossings during the AM and PM peak hours on a typical weekday.

Source: Tukwila Police Department, 2010 (collision data) and Fehr & Peers, 2010 (pedestrian/bicycle crossings data).

TABLE 8 – ROADWAY SEGMENT PEDESTRIAN AND BICYCLE COLLISION ANALYSIS (2004-2009)

Location	Pedestrian/Cyclist Collisions
Andover Park W from Strander Boulevard to Baker Boulevard	2
Interurban Avenue S from SR 5 to 48th Avenue S	2
42nd Avenue S from S 164th Street to S 160th Street	2
Interurban Avenue S from Southcenter Boulevard to 58th Avenue S	1
Interurban Avenue S from 58th Avenue S to 57th Avenue S	1
E Marginal Way S from S 130th Street to S 128th Street	1
Macadam Road S from S 144th Street to S 138th Street	1
42nd Avenue S from S 144th Street to S 142nd Street	1

Source: Tukwila Police Department, 2010.

As shown in **Tables 7** and **8**, none of the traffic fatalities during the study period involved a pedestrian or cyclist. As would be expected, most of the pedestrian/cyclist collisions did result in injuries since pedestrians and cyclists are not as physically protected as motorists. For the most part, the intersection and roadway segments where pedestrian and bicycle collisions occurred over the last six years involved only a single event. However, three collisions involving pedestrians or cyclists occurred over the last six years at the Baker Boulevard/Andover Park West intersection and there were two collisions at each of the following intersections and segments:

- Intersection of Interurban Avenue S and Gateway Drive
- Andover Park West from Strander Boulevard to Baker Boulevard
- Interurban Avenue S from SR 5 to 48th Avenue S
- 42nd Avenue S from S 164th Street to S 160th Street

TRAFFIC VOLUMES

Figure 8 displays average daily traffic (ADT) volumes throughout Tukwila in 2009. Average daily traffic exceeds 30,000 vehicles along S Boeing Access Road, Martin Luther King Jr. Way, Tukwila Parkway, and S 180th Street. **Figure 9** displays daily traffic volume trends on key roads throughout the city from 1994 to 2009. Despite the occasional peak or valley, volumes have remained fairly flat over the previous fifteen years. This is in spite of substantial growth in Southcenter and increases in freeway traffic.

Employment within the Southcenter area grew by nearly 17 percent from 1990 to 2000, but then dropped by 12 percent between 2000 and 2008. Traffic levels within the Southcenter area have shown far less variation than the fluctuations in employment.

A cordon was used to analyze traffic volumes in the Southcenter area. This method involves creating an imaginary boundary line around the outer edges of a study area. Traffic volumes are counted on the roads that cross the cordon lines. The volume, or counts, is combined to obtain a total volume.

Figure 10 shows how traffic crossing a cordon into Southcenter has changed over the same period. In general, **Figure 10** shows a slight increase in traffic between 1994 and 2007, with peaks and valleys in traffic generally following broader economic trends. The substantial drop in traffic during 2008 and 2009 reflects the most recent economic recession. In contrast, traffic volumes on I-5 at the SR 518/SR 405 interchange grew by ten percent from 1994 to 2009.

Southcenter Mall Trip Generation

As Southcenter continues to develop (for example, the mall expansion), more land uses are present within the same area. In this circumstance, trip generation tends to grow at a diminishing rate due to a well known phenomenon called trip internalization. Trip internalization increases in areas with a more diverse set of land use since residents and visitors can go to a variety of destinations within the same area.

The following table compares peak hour trip generation estimates from the Institute of Transportation Engineers, the City of Tukwila travel model, and actual counts from 2009.

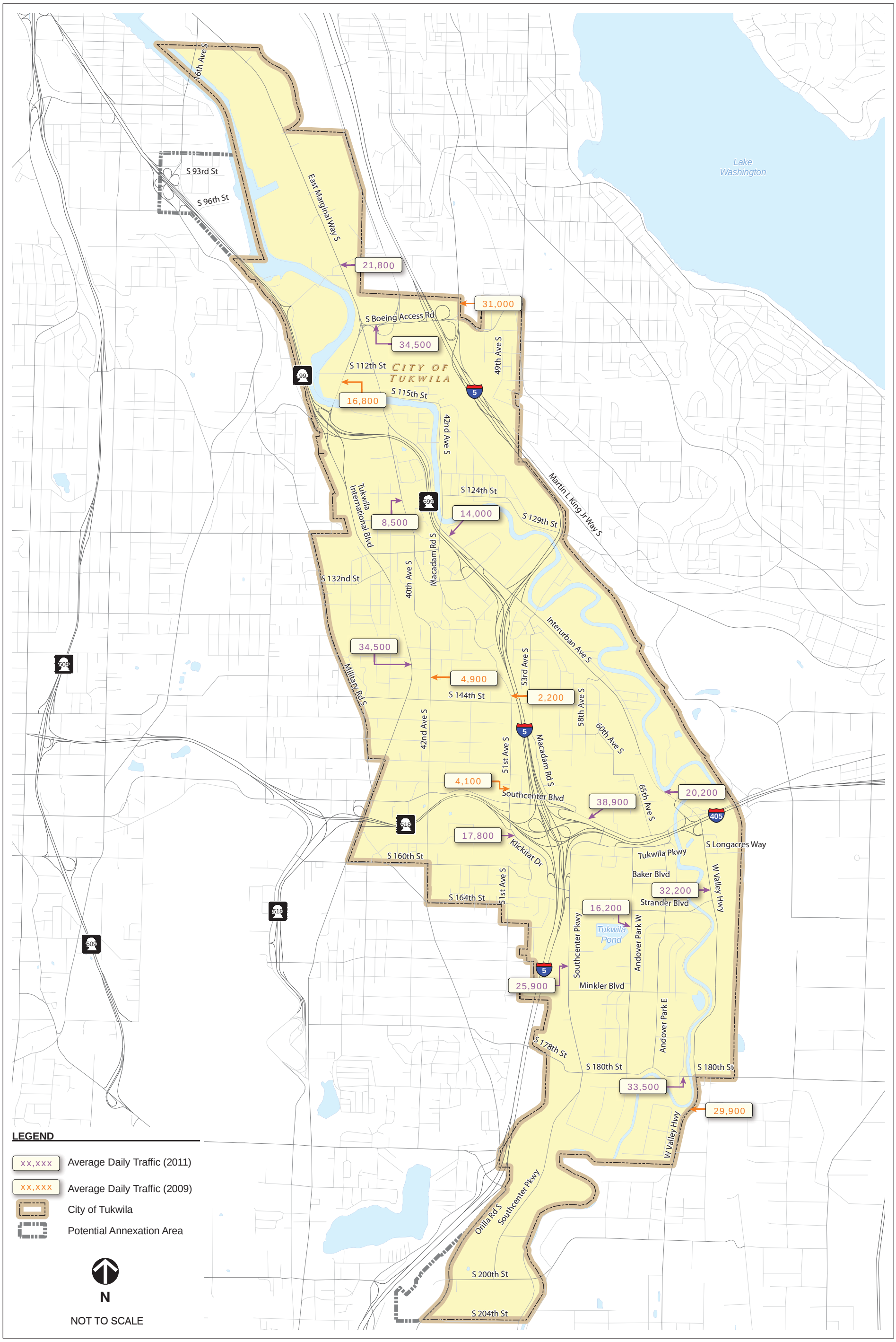
TABLE 9 – SOUTHCENTER MALL TRIP GENERATION

Peak Hour	Trips (Number of Vehicles Entering or Exiting Southcenter Mall)		
	ITE	Model	Counts
AM	834	1,612	622
PM	4,329	5,430	4,507
Saturday	5,507	N/A	5,074

Source: Institute of Transportation Engineers, Trip Generation, 8th Ed.

Note: Peak hour within 7-10 AM for the morning, 4-7 PM for the afternoon, and 12-3 PM for Saturday.

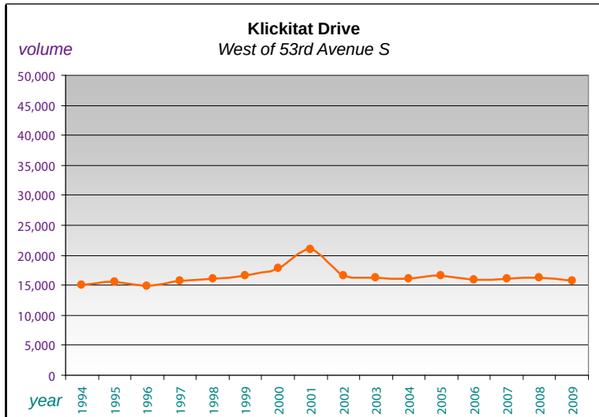
As is typical, the travel model tends to overestimate trip generation for large retail centers like Southcenter. Therefore, raw trip generation numbers from the travel model are post-processed to more accurately represent the specific situation.

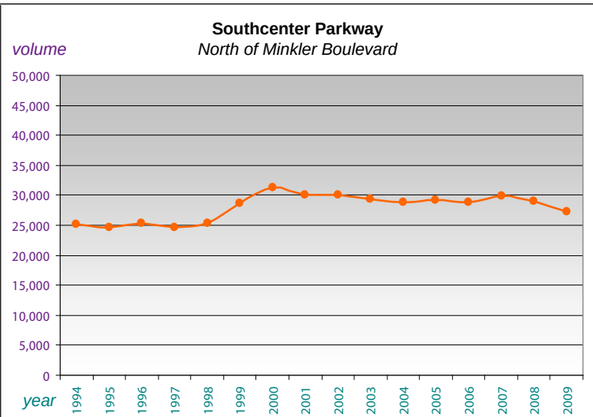


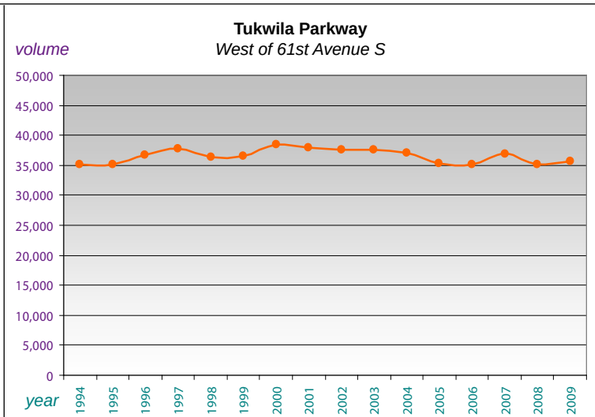
FEHR PEERS

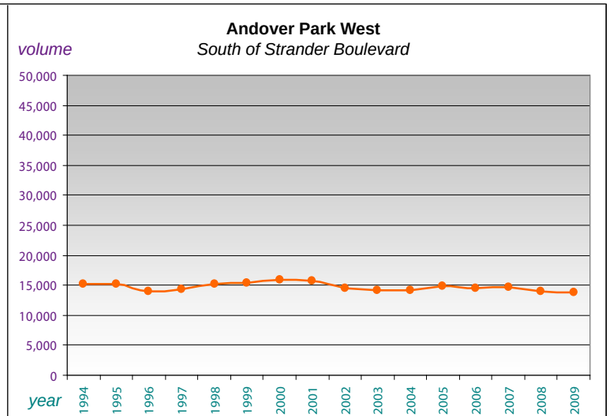
\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig08_2009_vols_12locs.mxd

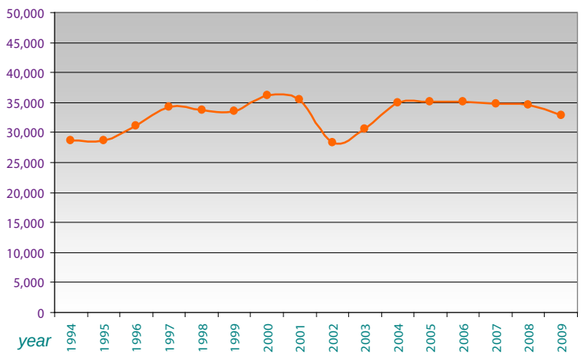
CITY OF TUKWILA -
EXISTING AVERAGE WEEKDAY TRAFFIC (AWDT) VOLUMES
FIGURE 8

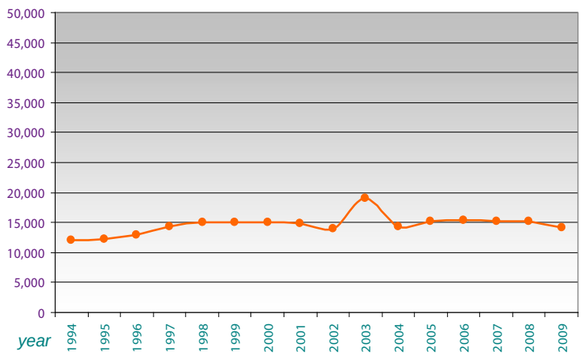


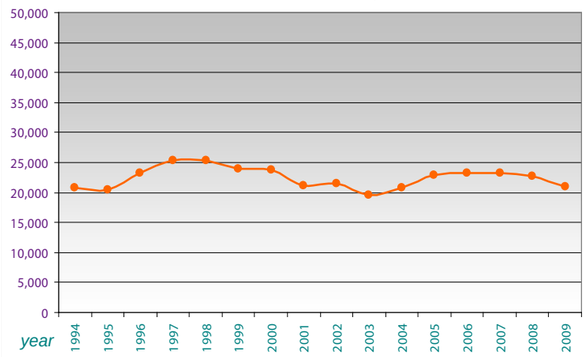


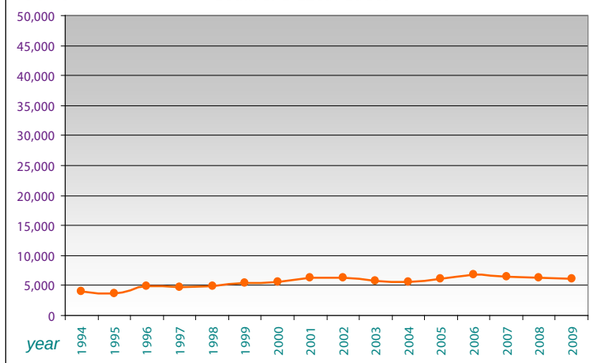


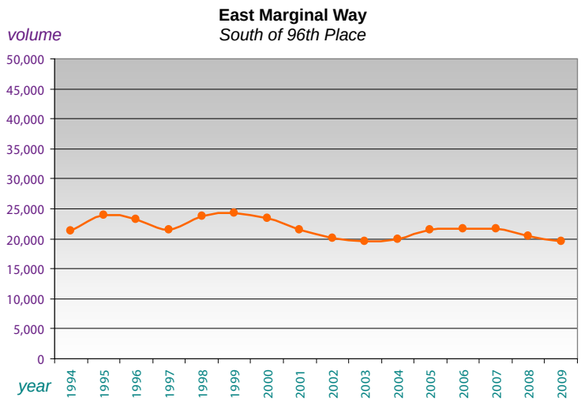


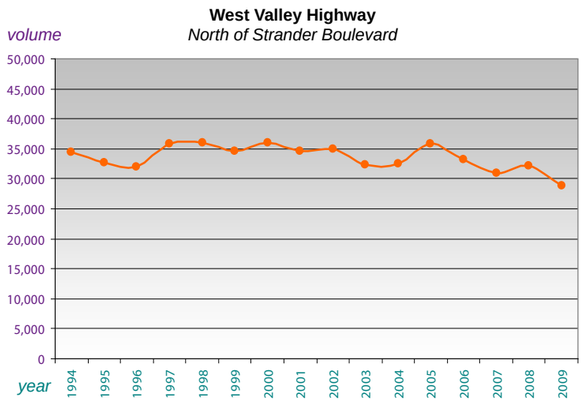


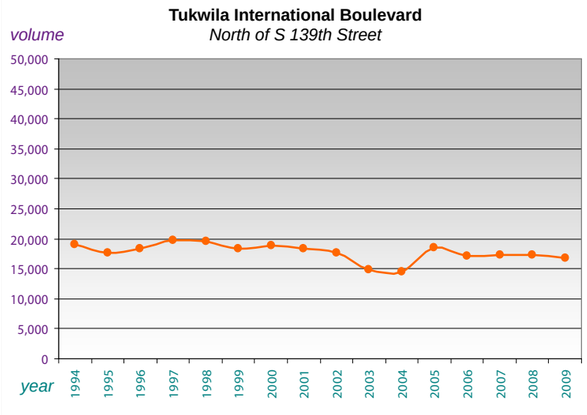


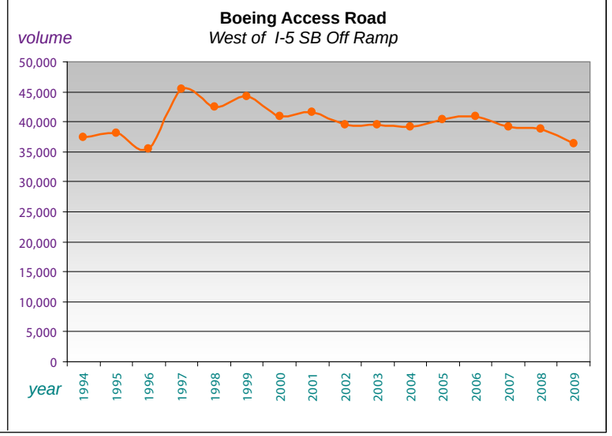












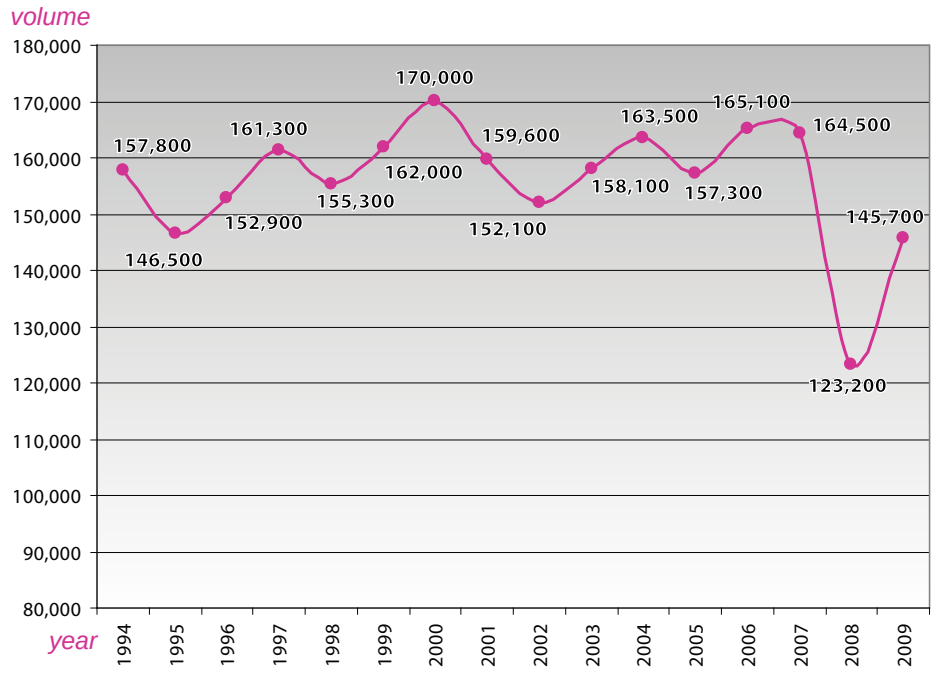
FEHR PEERS

\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\AI\fig09_voltrend_12locs_94_09.ai

CITY OF TUKWILA -
DAILY TRAFFIC VOLUME TRENDS - 1994-2009

FIGURE 9

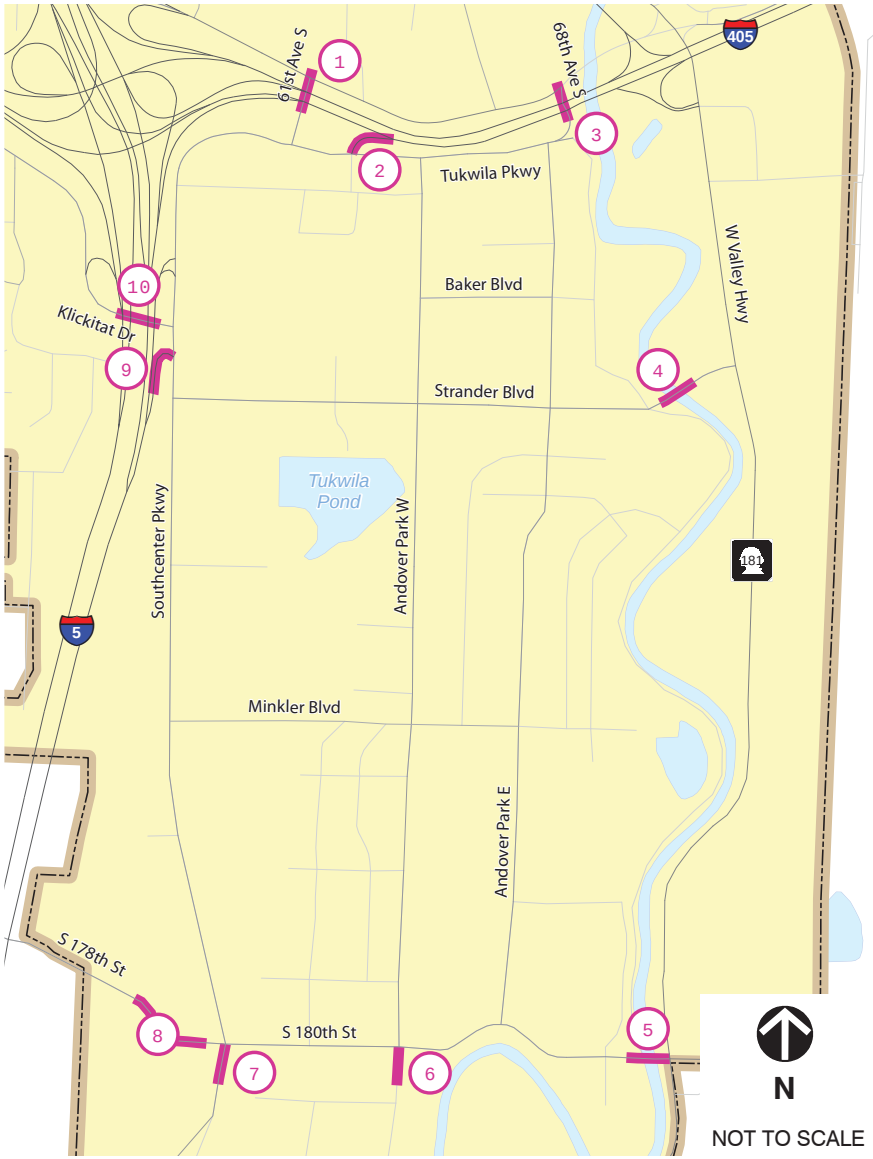
Southcenter Cordon Volume Chart



Southcenter: Cordon Locations *

1. 61st Avenue S at I-405
2. I-405 On Ramp from Tukwila Parkway
3. 68th Avenue S at I-405
4. Strander Boulevard at Green River
5. S 180th Street at Green River
6. Andover Park West south of S 180th Street
7. Southcenter Parkway south of S 180th Street
8. S 178th Street west of Southcenter Parkway
9. I-5 Northbound Off Ramp to Southcenter Parkway
10. Klickitat Drive at I-5

* Cordon counts are designed to calculate the total vehicle volumes entering and leaving an area by collecting data at all major access and egress locations.



FEHR & PEERS

CITY OF TUKWILA -
SOUTHCENTER CORDON VOLUMES - 1994-2009
FIGURE 10

TRANSPORTATION SYSTEM OPERATIONS ANALYSIS

This section presents the methodology and results of the transportation systems operations analysis completed on corridors and intersections throughout Tukwila.

Methodology

The operations of the transportation system in Tukwila were analyzed using several different methodologies, described below. The Transportation Research Board's *2010 Highway Capacity Manual* (HCM) defines the methodologies to calculate multimodal level of service (MMLOS) for auto, bicycle, transit, and pedestrian modes along roadway corridors. These methods were originally developed as part of National Cooperative Highway Research Program (NCHRP) Report 616, but were adopted into the 2010 HCM as this project was underway. The MMLOS methodologies were applied to a set of major arterial roadways in the City of Tukwila to calculate LOS for pedestrian, bicycle, and auto modes during the PM peak hour. Note that transit LOS was not calculated as part of this study since the City has no control over the transit service provided by King County Metro and Sound Transit.

Pedestrian and Bicycle Level of Service

The methodology for computing the Pedestrian and Bicycle LOS is a complex and lengthy process and **Table 10** summarizes the key data inputs for pedestrian and bicycle modes. A more detailed description of the Pedestrian and Bicycle LOS methodology is described in the memoranda in **Appendix A**. **Figure 11** shows the MMLOS analysis corridors.

Auto Segment Level of Service

Auto LOS is based on the average number of stops per mile and the presence of left turn lanes at signalized and unsignalized intersections along the roadway segment. Stops per mile are calculated using the volume to capacity (v/c) ratio and signal progression[4] of the through movement at the segment's downstream intersection. With the exception of the presence of left-turn lanes at unsignalized intersections along the segment, auto LOS is completely dependent on the characteristics of the intersection located at the downstream end of the roadway segment. Roadway characteristics such as lane width or presence of street trees are not included in the methodology.

Auto Intersection Level of Service

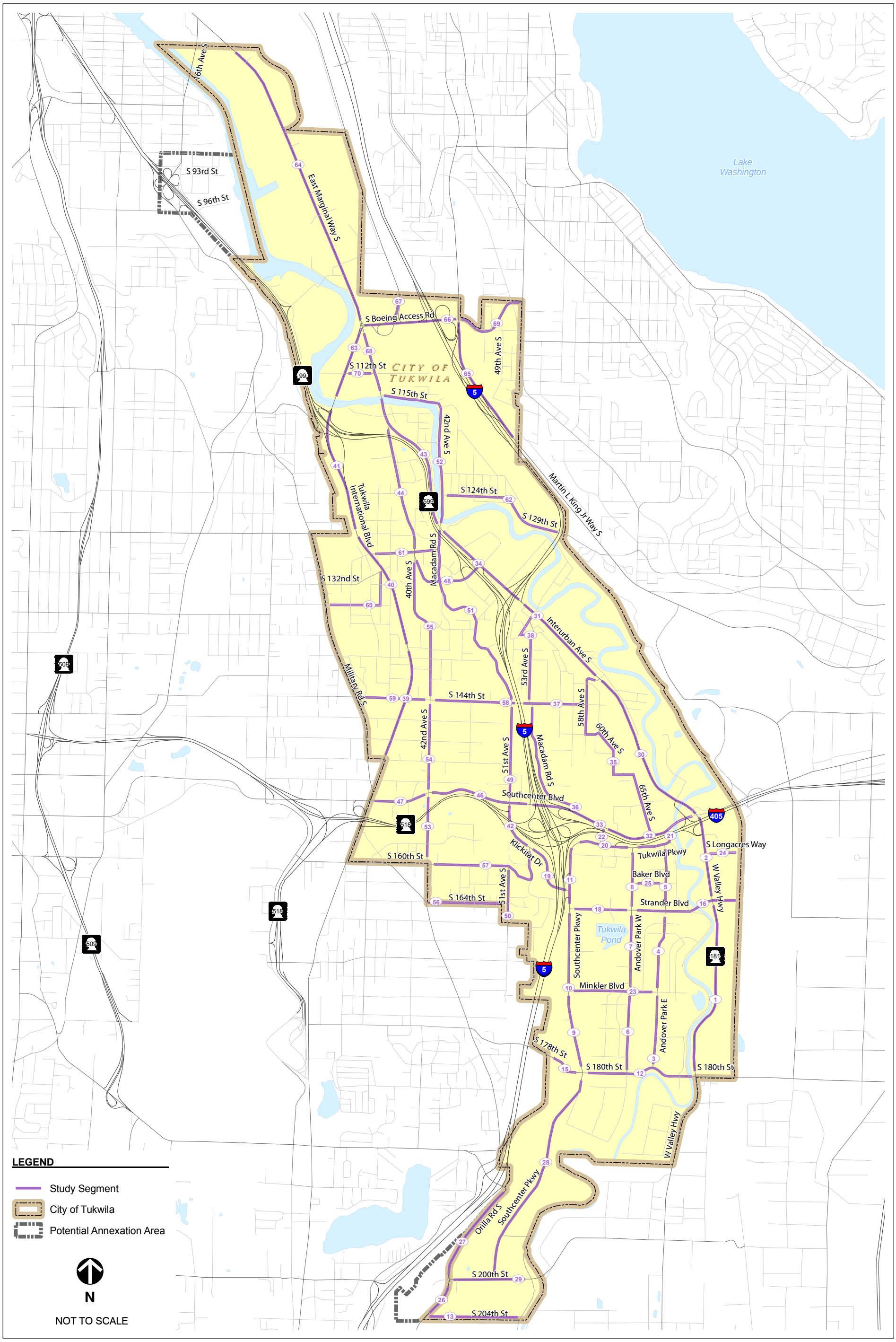
Corridor MMLOS techniques describe the traffic operations characteristics along a segment of roadway, but cannot identify operational deficiencies at intersections. Therefore, major intersections in Tukwila were analyzed using standard techniques from the 2000 HCM. Under the 2000 HCM, LOS at a signalized intersection is measured in terms of average delay per vehicle in seconds and is rated with letters A through F, where "F" indicates the most congestion. Average delay is also reported for four-way stop-controlled intersections. The delay of the worst movement is reported for two-way stop-controlled intersections. **Table 11** shows the correspondence between delay and LOS, as defined by 2000 HCM. **Figure 12** displays the study intersections analyzed using this methodology.

[4] Signal progression is a term from the highway capacity manual, which describes the quality of signal coordination on a one to five scale. Signal progression of one represents very poor progression where vehicles are stopped by most traffic signals, while five represents exceptional progression where vehicles can proceed along a corridor with few stops or delays.

TABLE 10 – INPUT DATA REQUIREMENTS – PEDESTRIAN AND BICYCLE LOS CALCULATIONS

Data Category	Input Data Element	Ped. Mode	Bicycle Mode
Traffic Characteristics	Mid-segment flow rate (motorized vehicles)	X	X
	Percent heavy vehicles		X
	Pedestrian flow rate	X	
	Percentage of on street parking occupied	X	X
Geometric Design	Downstream intersection width	X	
	Segment length	X	X
	Number of through lanes	X	X
	Width of outside through lane	X	X
	Width of bicycle lane	X	X
	Width of paved outside shoulder	X	X
	Median type and curb presence	X	X
	Number of access point approaches		X
	Presence of a sidewalk	X	
	Total walkway width	X	
	Effective width of fixed objects	X	
	Buffer width	X	
	Spacing of objects in buffer	X	
Other	Pavement condition rating		X
	Distance to nearest signal-controlled crossing	X	
	Legality of mid-segment pedestrian crossing	X	
	Prop. of sidewalk adjacent to window, building or fence	X	
Performance Measures	Motorized vehicle running score	X	X
	Pedestrian delay	X	
	Bicycle delay		X
	Pedestrian LOS score for intersection	X	
	Bicycle LOS score for intersection		X

Source: Highway Capacity Manual, 2010.

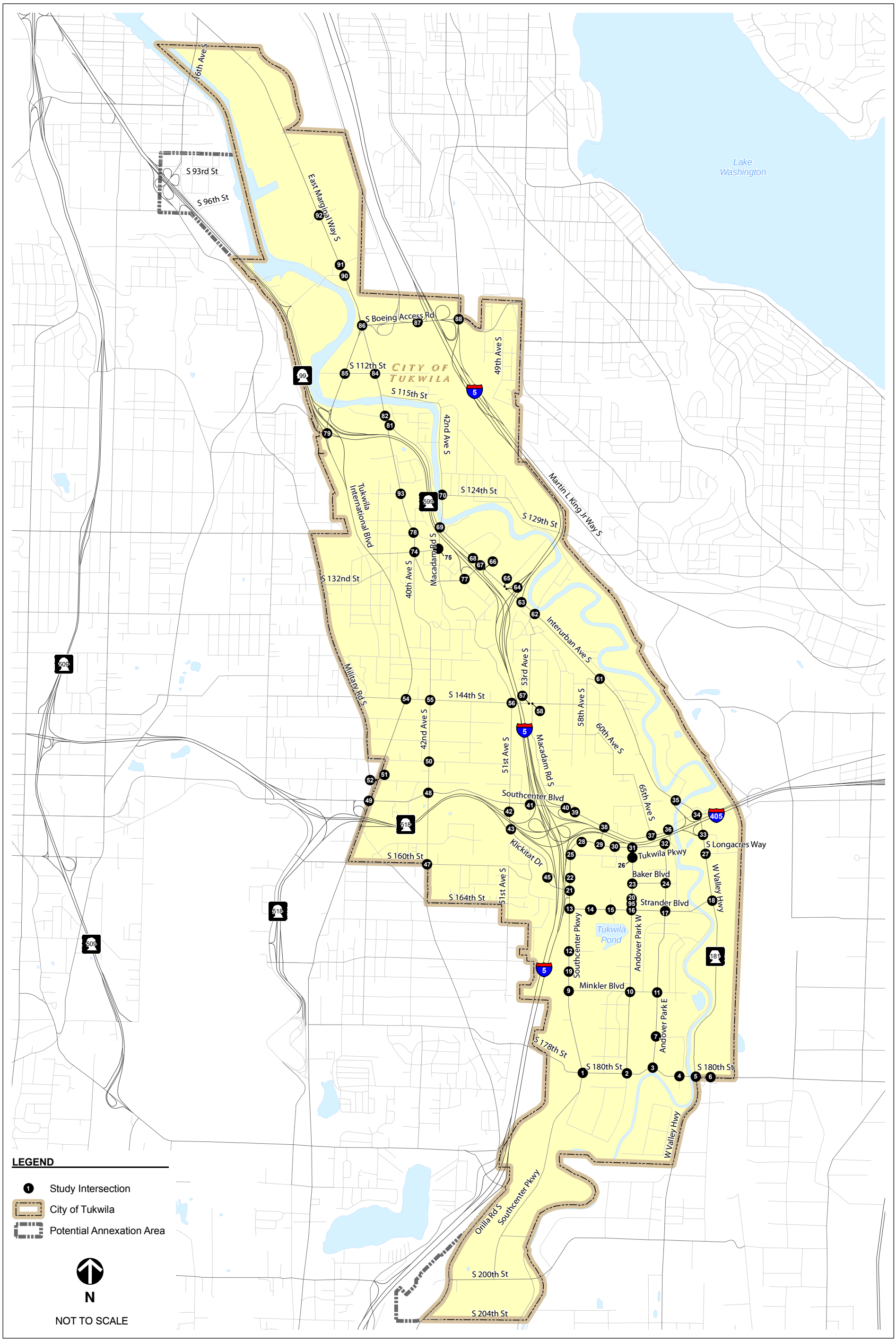


FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig11_studySegs.mxd

CITY OF TUKWILA - MMLOS STUDY SEGMENTS

FIGURE 11



LEGEND

- Study Intersection
- City of Tukwila
- Potential Annexation Area

N

NOT TO SCALE

FEHR & PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig12_studyInts.mxd

CITY OF TUKWILA - STUDY INTERSECTIONS (EXISTING CONDITIONS)

FIGURE 12

TABLE 11 – DEFINITION OF INTERSECTION LEVELS OF SERVICE

LOS	Delay per Vehicle in Seconds	
	Signalized	**Unsignalized**
A	≤10	≤10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	>80	>50

Highway Capacity Manual, 2000.

Southcenter Corridor Level of Service

The City of Tukwila's Comprehensive Plan sets the standards for concurrency. In the Southcenter area, corridor level of service is calculated as the average delay of given key intersections along each corridor. The 11 corridors, and corresponding intersections, are displayed in Figure 23 in the results section. For all areas outside Southcenter, the City calculates LOS at intersections, rather than corridors.

Bicycle Level of Service

Bicycle LOS is a weighted average of study segment LOS and intersection LOS. Bicycle segment LOS is based on vehicle volume, vehicle speed, number of lanes, percent heavy vehicles, parking conditions, lane and shoulder widths, pavement quality, and number of unsignalized conflicts[5]. Bicycle intersection LOS is based on vehicle volumes, bicycle crossing distance, and lane geometries[6]. Bicycle LOS is not influenced by grades or other factors such as weather that may make bicycling physically difficult or less appealing. Corridors with no bicycle facilities are not necessarily worthy of a poor rating if it is not warranted by other influential factors.

[5] Unsignalized conflicts are defined as unsignalized side street and driveway intersections.

[6] Lane geometry refers to the physical layout of the roadway such as number and width of lanes.

Pedestrian Level of Service

Pedestrian LOS is influenced by vehicle speed and volume, presence of on-street parking, length of traffic signal cycle, sidewalk width, buffer and barrier presence[7], shoulder or bike lane width, sidewalk and intersection geometry, and cross street speed and volume. Pedestrian LOS does not take adjacent land use into consideration. It is also not influenced by grade or other factors such as weather that may make walking less attractive. Similar to bicycle LOS, pedestrian LOS is based on a weighted average of the segment and intersection LOS.

Pedestrian LOS combines intersection and segment characteristics to provide one LOS score. In certain circumstances, this can lead to segments with poor or missing pedestrian facilities to receive a higher overall score than might otherwise be expected due to the influence of the intersection LOS score. An alternative method of using this methodology to examine pedestrian corridors was considered, but ultimately not used as it is not compliant with how the HCM 2010 MMLOS was developed and intended to be used. This method was to only report the segment LOS score. **Figure 13** details the results of examining pedestrian facilities on a segment-only basis, with further results detailed in **Appendix B**.

Limitations of the Methodology

The 2010 HCM MMLOS methodology represents a major change in how LOS is calculated for pedestrian and auto modes. The new methodology is a break from the capacity-based approach described in the 2000 HCM, which was only applicable to extremely crowded areas like airports, sports events, or busy sidewalks like those of New York or Chicago. While the "experience-based" pedestrian and bicycle LOS methodology described above is more appropriate for locations like Tukwila, a review of the methodology identifies several limitations:

1. Inability to consider urban form: Research[8] has indicated that urban form influences people's decision to walk or cycle, as opposed to driving a car. Namely, attractive walking and cycling environments that include street trees, public seating, and street-oriented attractive building facades, can all improve the quality of the walking or cycling experience. In developing the pedestrian and bicycle LOS methodology, the 2010 HCM did not include factors related to urban form and therefore the methodology cannot speak the appropriateness of different types of bicycle or pedestrian facilities in pedestrian oriented areas like Southcenter.

2. Lack of data on terrain: The 2010 HCM methodology is narrowly focused on the width of public right-of-way dedicated to pedestrian and bicycle travel and does not consider terrain factors like grades when assessing LOS. Tukwila has several areas with substantial grades that are inappropriate for bicycle travel and could be difficult to traverse on foot. In these areas, the 2010 HCM MMLOS analysis may indicate that pedestrian or bicycle enhancements may be desirable, but considering the terrain, sidewalks or bicycle lanes may be unreasonable.

[7] A buffer is an area (typically landscaped) between the edge of the sidewalk and the edge of the roadway. A barrier is a design feature that physically separates the pedestrians from the traffic stream. A barrier can be a railing, a low wall, or a row of closely spaced trees.

[8] See: Krizek, K., et. al., *Explaining Changes in Walking and Bicycling Behavior: Challenges for Transportation Research*, Environment and Planning B: Planning and Design 36 (4), pp. 725-740, 2009. *Does the Built Environment Influence Physical Activity?* Transportation Research Board Special Report 282, 2005.

3. Certain amenities are not considered: The 2010 HCM methodology does not consider pedestrian and bicycle enhancements like lighting, seating, or bicycle racks. In some circumstances, the pedestrian and bicycle environment could be substantially enhanced through the inclusion of these amenities, however the 2010 HCM methodology cannot evaluate their benefit.

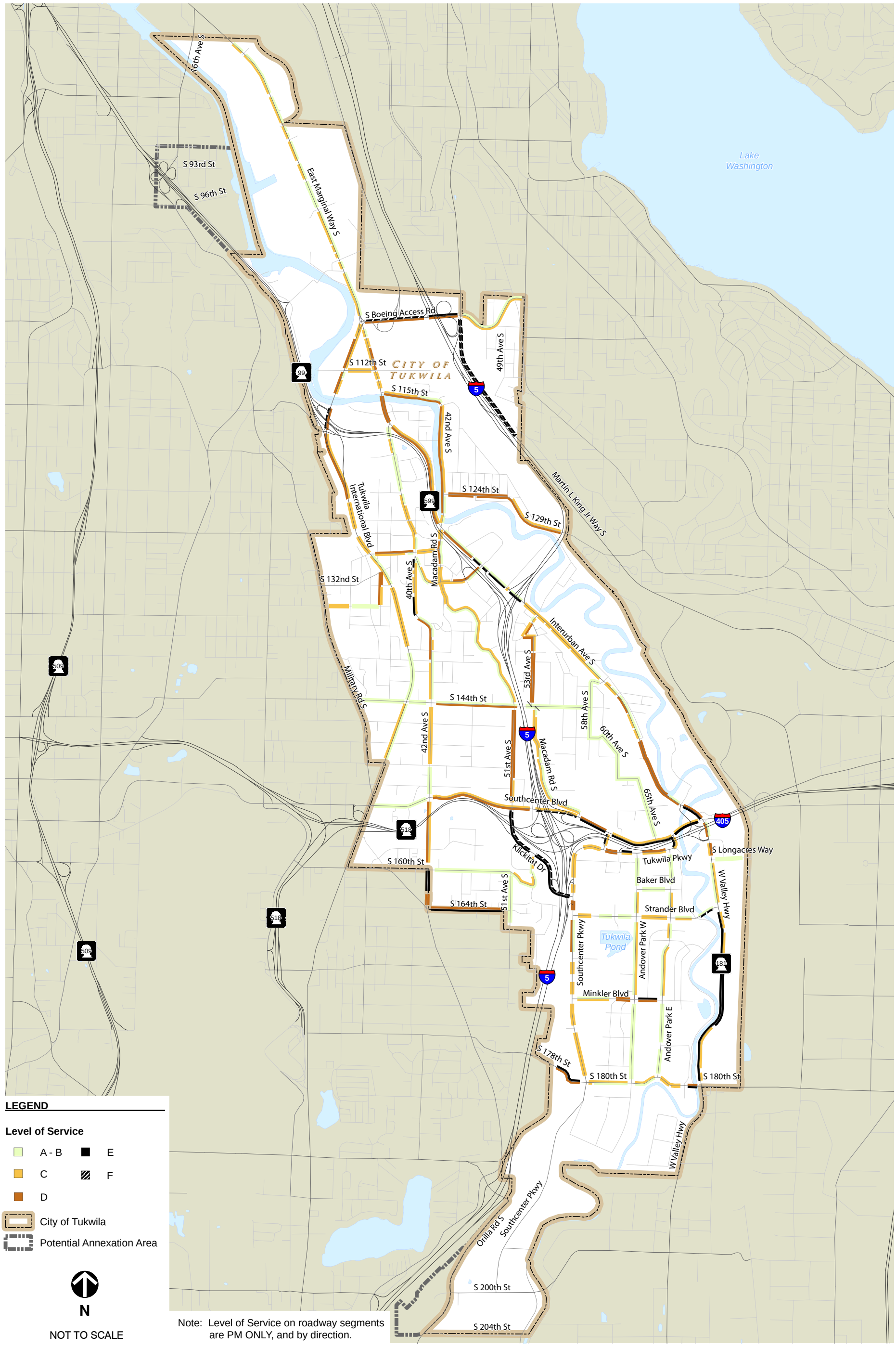
Given these limitations, the City should establish policy guidance related to how the results of the MMLOS analysis should be interpreted. Specifically, MMLOS results could be used in conjunction with complete street design guidelines which specify minimum requirements for the roadways, bicycle facilities, and sidewalks in different areas of the City. These design guidelines should be sensitive to neighborhood characteristics like current and planned urban form, traffic volumes for all modes, roadway functional classification (including modal priority), and available right-of-way. As part of this transportation assessment, the MMLOS results were used to prioritize the projects recommended in the *Walk and Roll* plan and to identify several new bicycle and pedestrian improvements (see Chapter 3).

Results

Multiple figures are used to summarize transportation system operations throughout Tukwila. **Figure 14** summarizes the six subareas of the city that are used to display results.

Figures 15 through **20** display the results by zone. Each zone has three figures associated with it: one displaying automobile LOS (both MMLOS corridor[9] and intersection), one displaying bicycle LOS, and one displaying pedestrian LOS. **Figure 21** highlights those study segments with an auto, bicycle, or pedestrian level of service of E or F. Note that on **Figure 21**, the directions used to identify pedestrian segments refer to the sidewalk adjacent to the given direction's traffic flow.

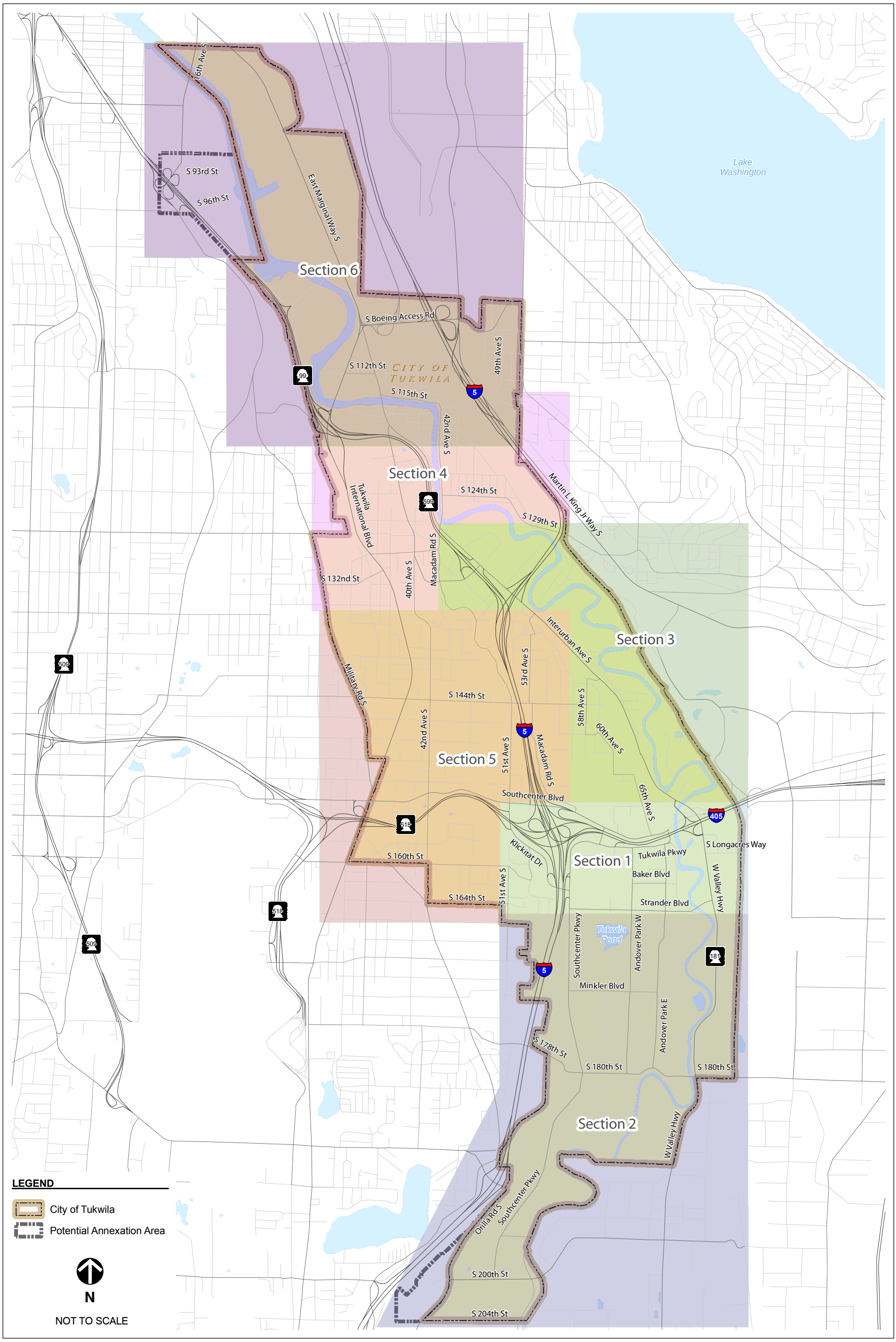
[9] Only the MMLOS corridor results are included in Figures 15 through 21. The Southcenter auto corridor level of service calculated using the methodology required by the Comprehensive Plan is presented later.



FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig14_pedLOS2.mxd

CITY OF TUKWILA -
PEDESTRIAN SEGMENT-ONLY LEVEL OF SERVICE
FIGURE 13

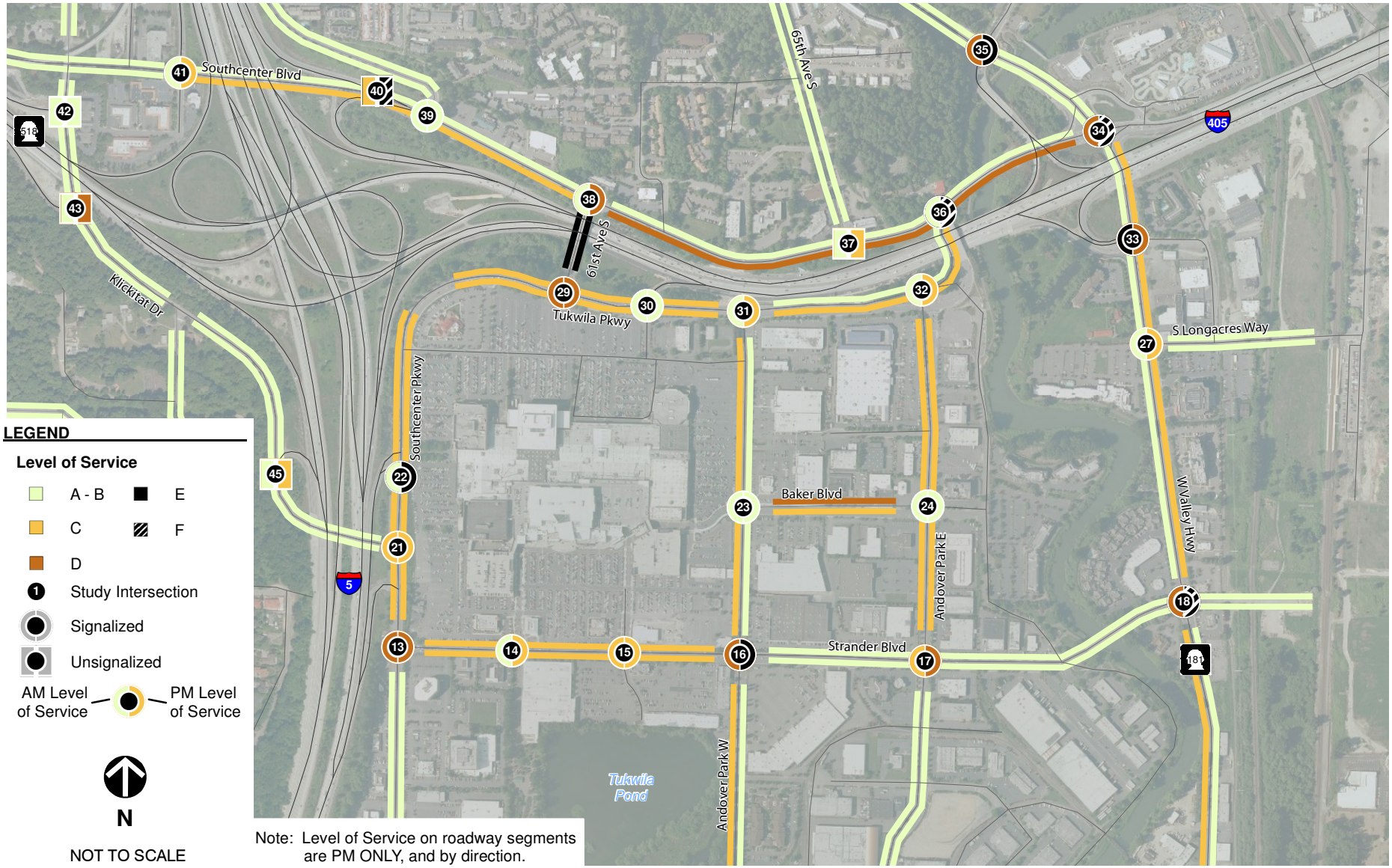


FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig13_keyMap_noS.mxd

CITY OF TUKWILA - KEY MAP (SECTIONS)

FIGURE 14

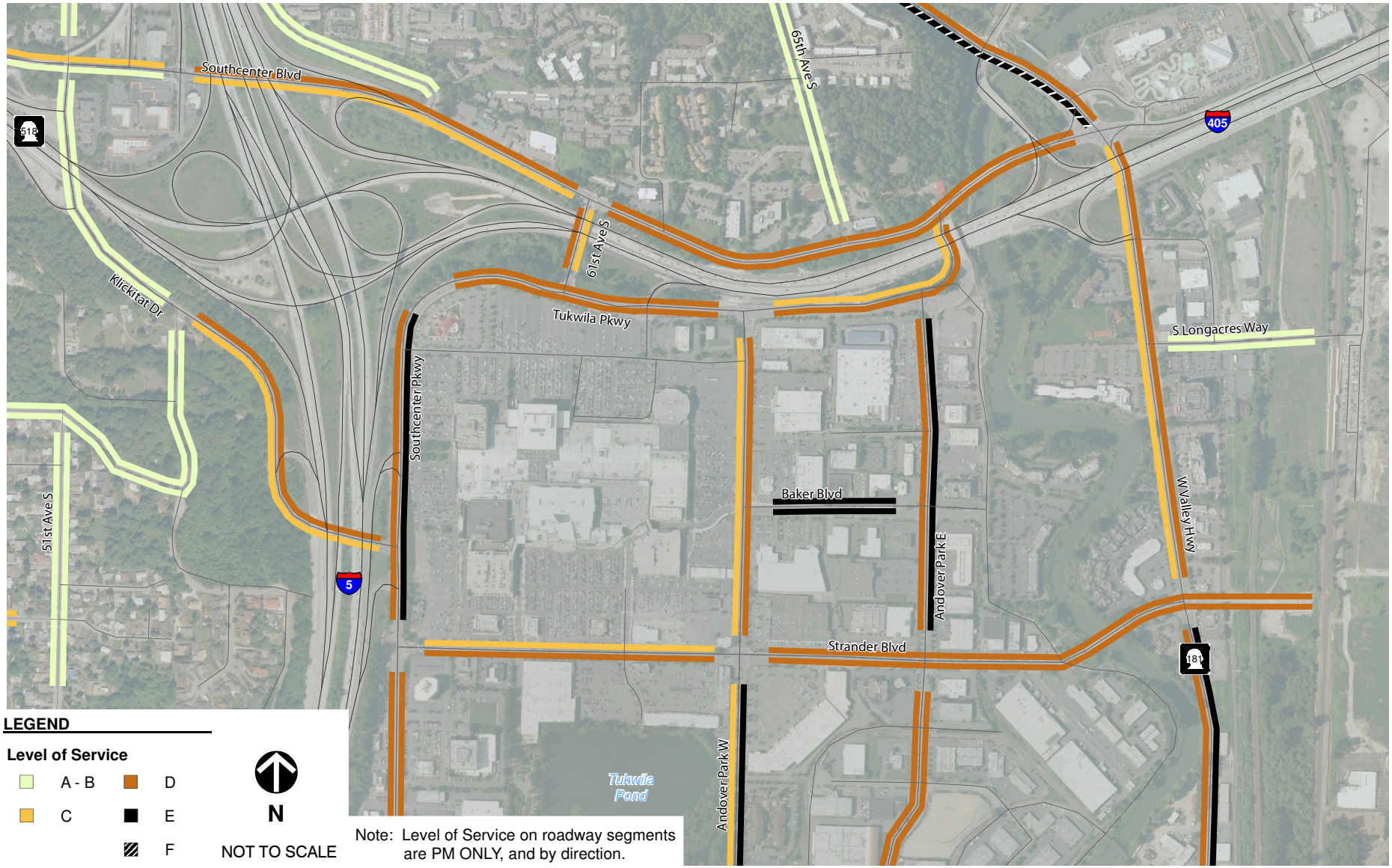


CITY OF TUKWILA - 2010 INTERSECTION AND ROADWAY SEGMENT LEVEL OF SERVICE (SECTION 1)

FIGURE 15A

FEHR & PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig15A_los_sec1_INT_hash_Switch.mxd

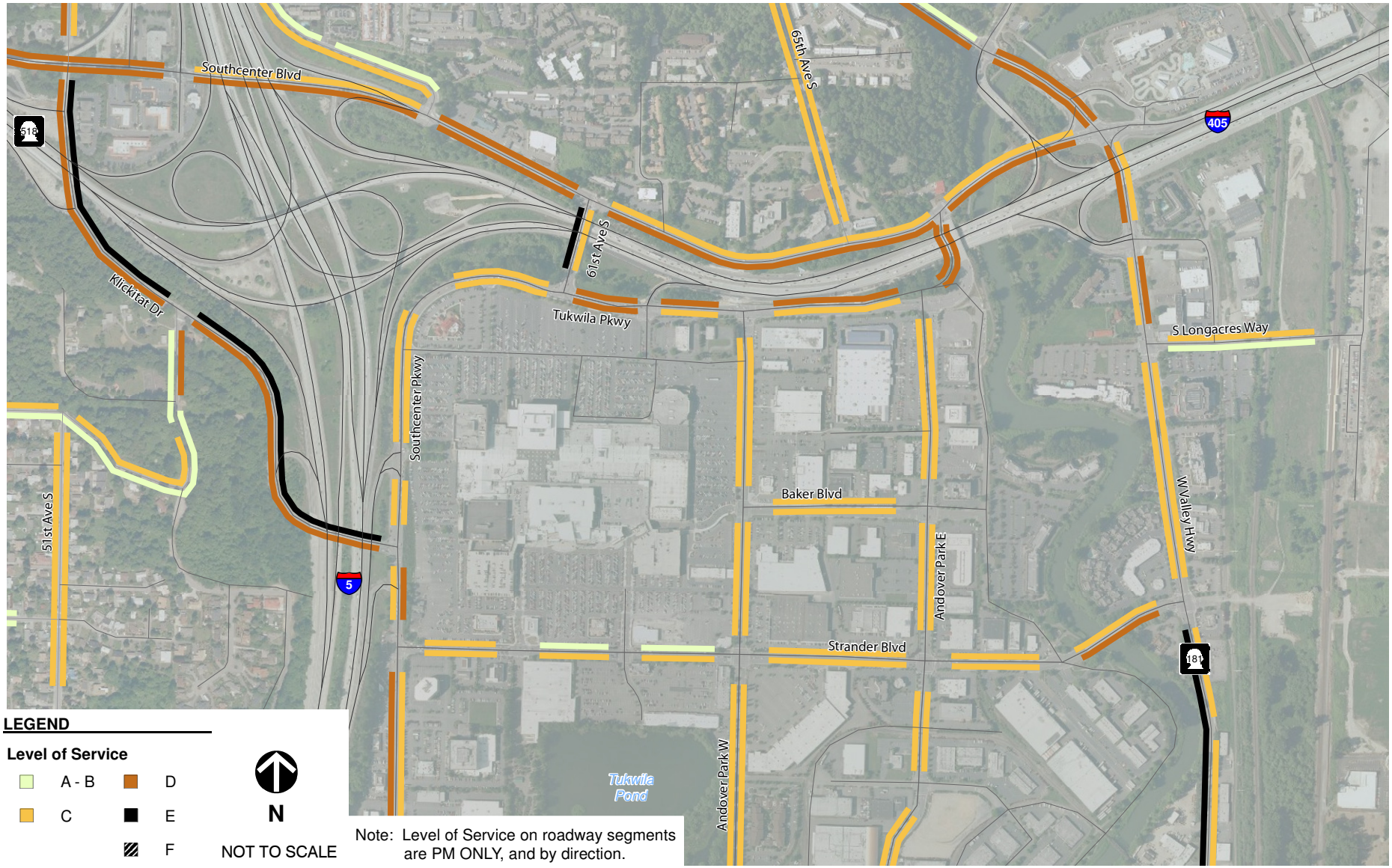


CITY OF TUKWILA - 2010 BICYCLE LEVEL OF SERVICE (SECTION 1)

FIGURE 15B

FEHR & PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig15B_los_zone1_BIKE_hash.mxd

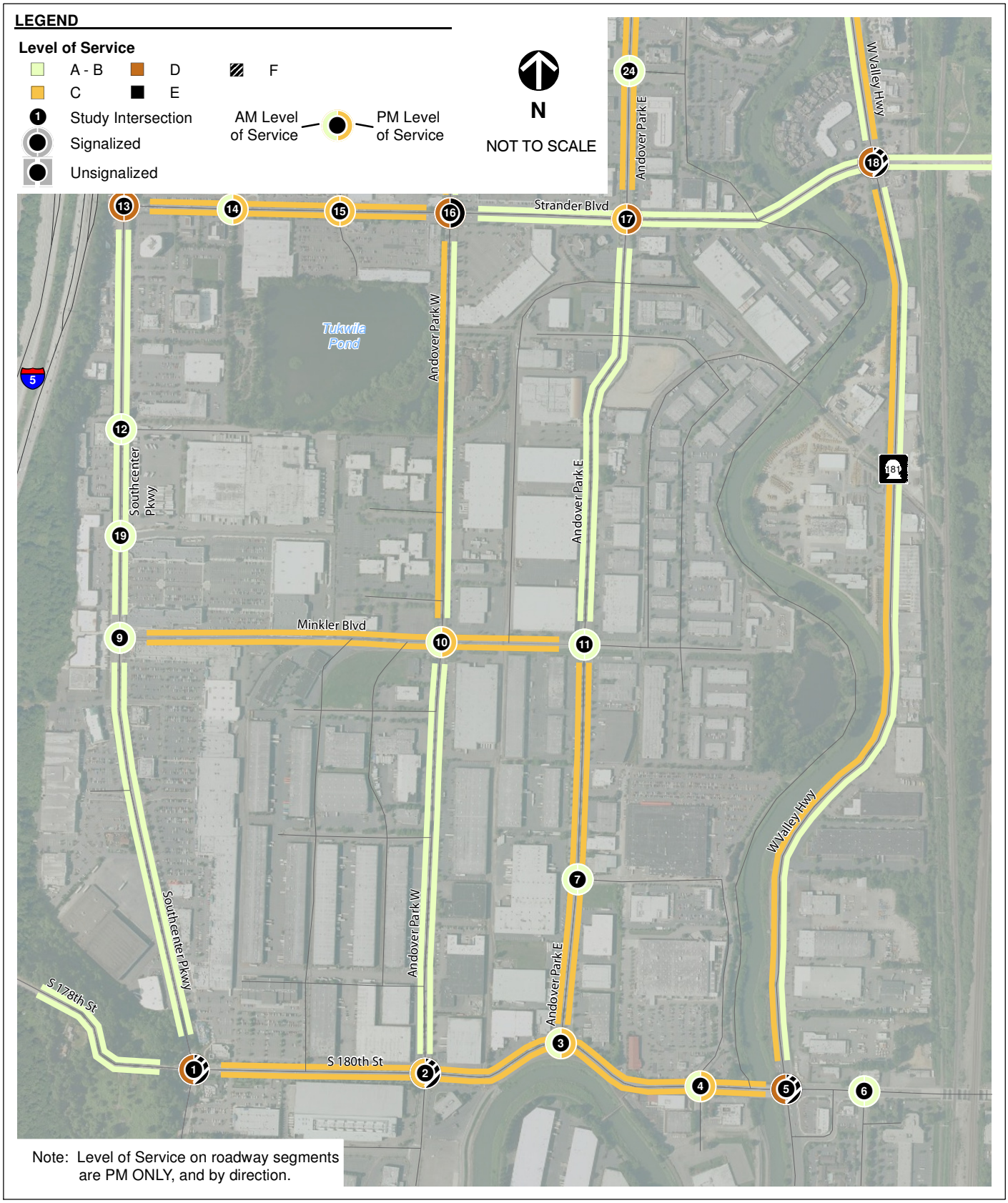


CITY OF TUKWILA - 2010 PEDESTRIAN LEVEL OF SERVICE (SECTION 1)

FIGURE 15C

FEHR & PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig15C_los_zone1_PED_hash.mxd

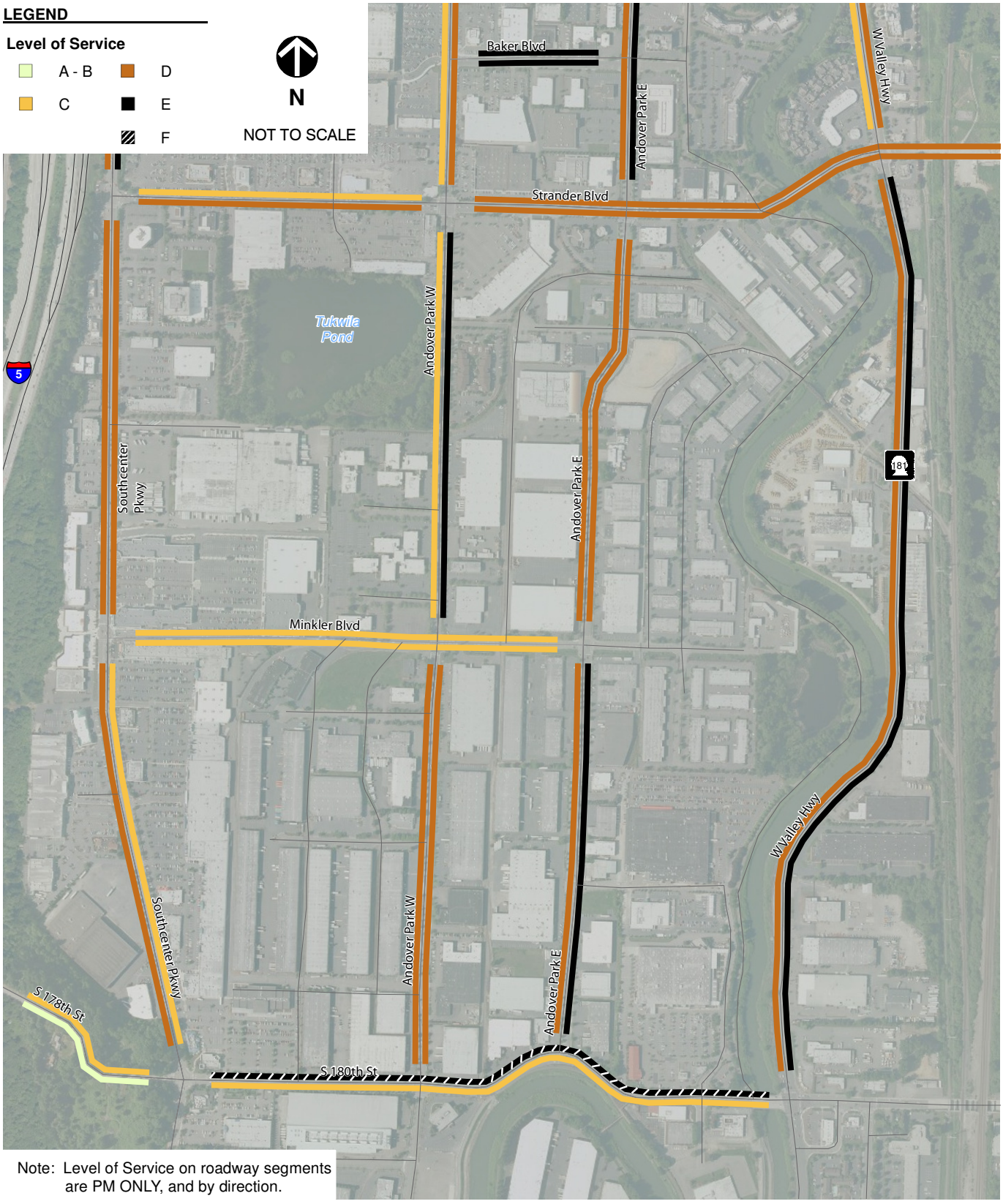


CITY OF TUKWILA - 2010 INTERSECTION AND ROADWAY SEGMENT LEVEL OF SERVICE (SECTION 2)

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig16A_los_sec2_INT_hash.mxd

FIGURE 16A



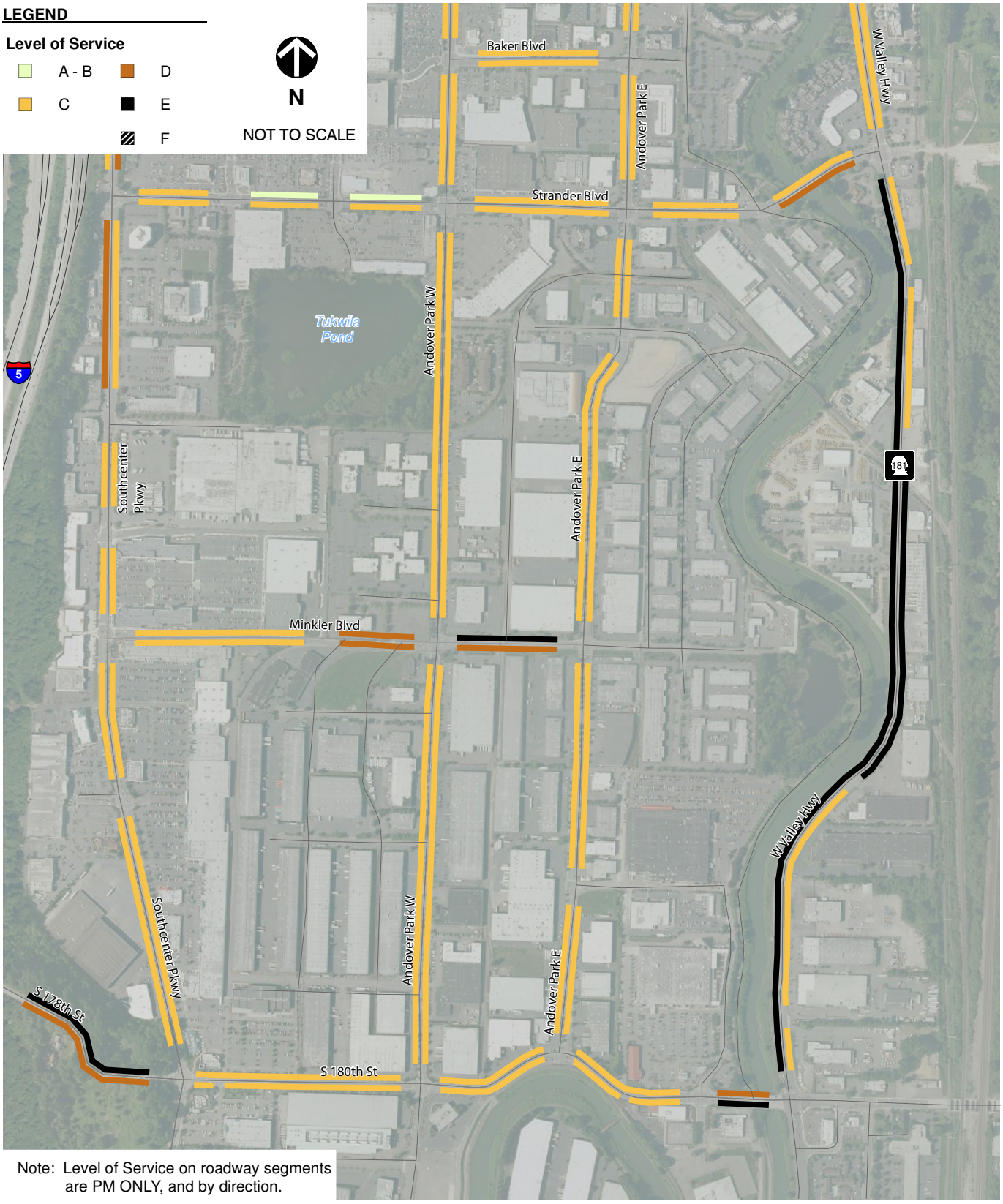
Note: Level of Service on roadway segments are PM ONLY, and by direction.

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig16B_los_zone2_BIKE_hash.mxd

CITY OF TUKWILA -
2010 BICYCLE LEVEL OF SERVICE
(SECTION 2)

FIGURE 16B



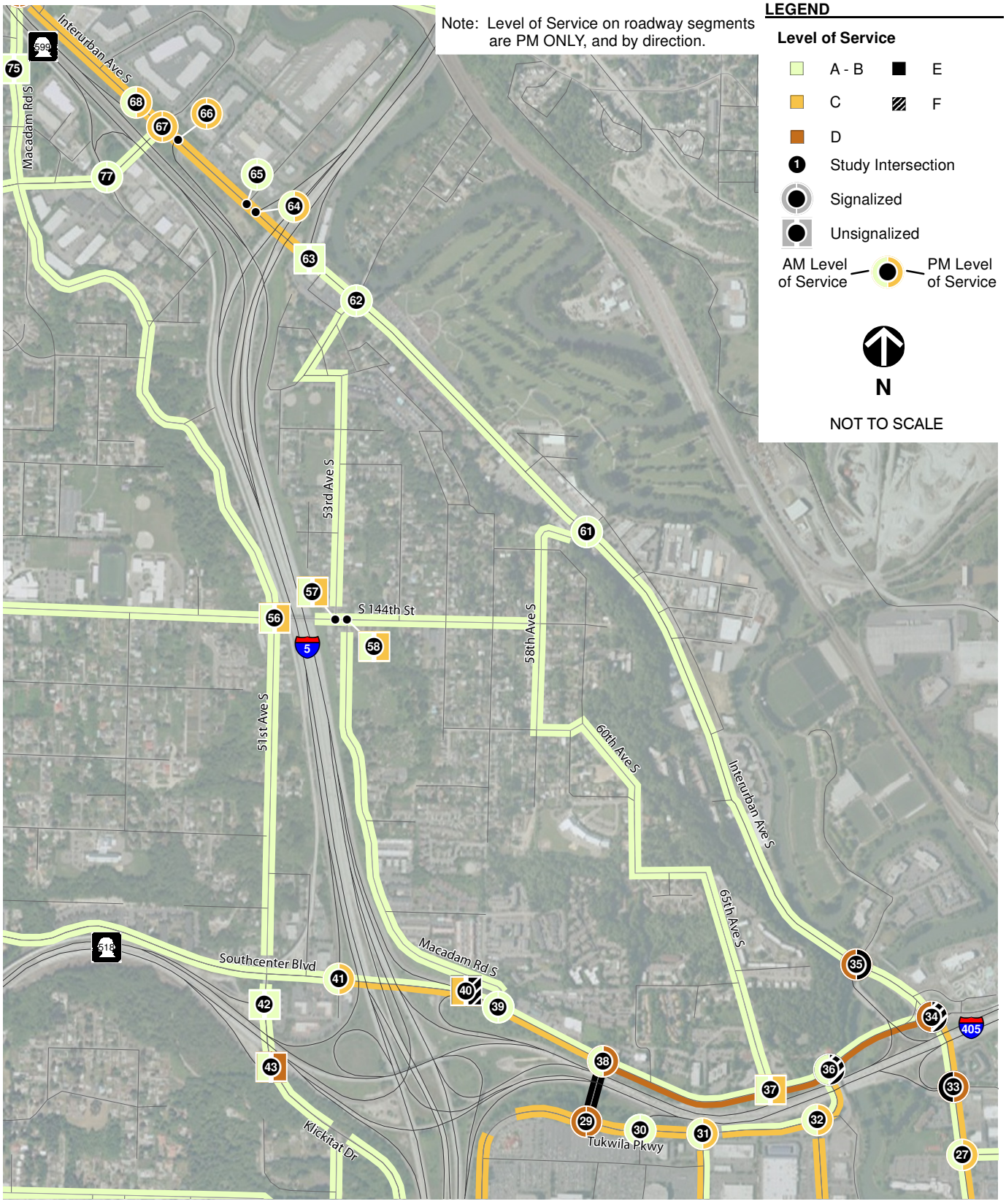
Note: Level of Service on roadway segments are PM ONLY, and by direction.

CITY OF TUKWILA - 2010 PEDESTRIAN LEVEL OF SERVICE (SECTION 2)

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig16C_los_zone2_PED_hash.mxd

FIGURE 16C

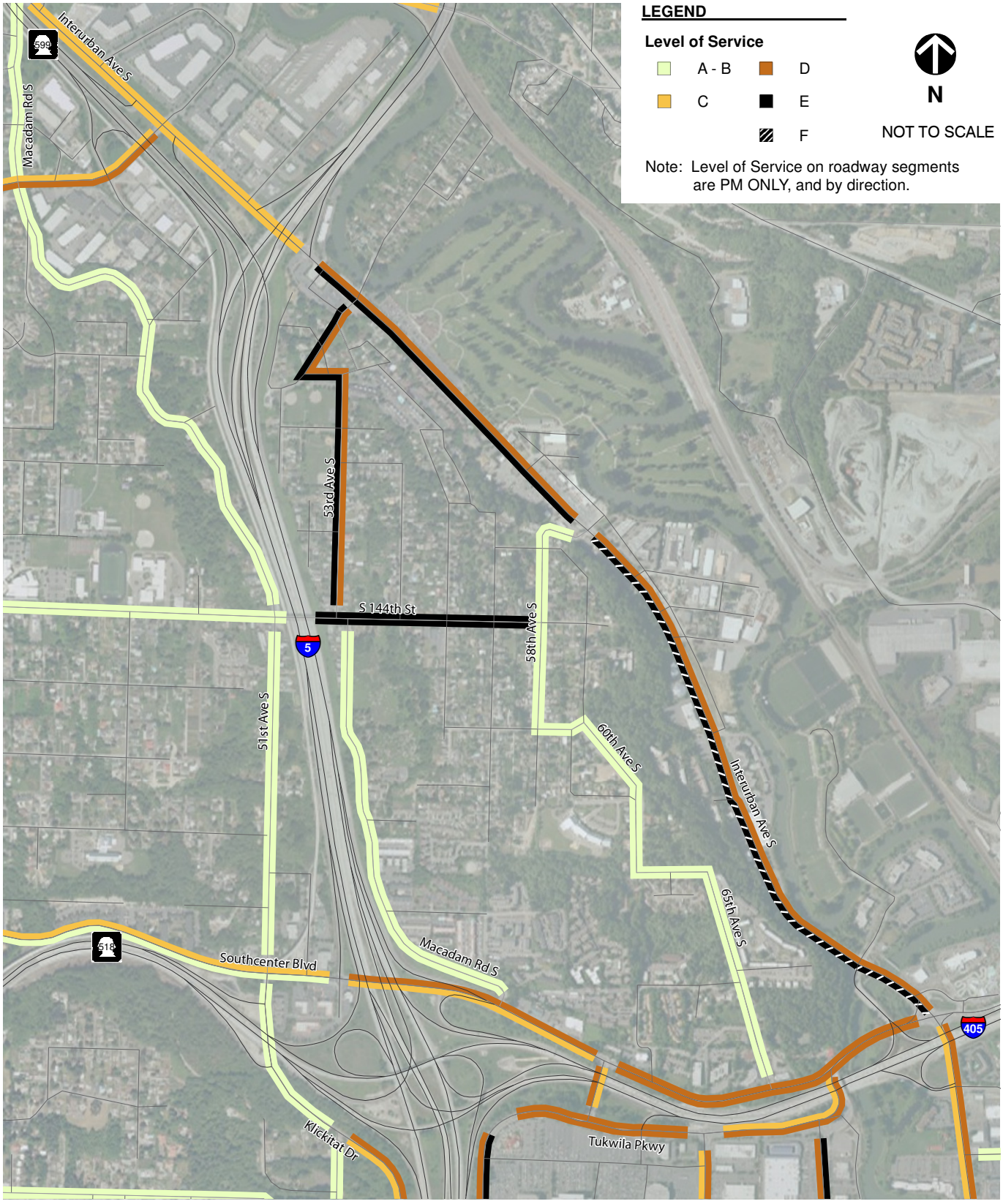


CITY OF TUKWILA - 2010 INTERSECTION AND ROADWAY SEGMENT LEVEL OF SERVICE (SECTION 3)

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig17A_los_sec3_INT_hash.mxd

FIGURE 17A

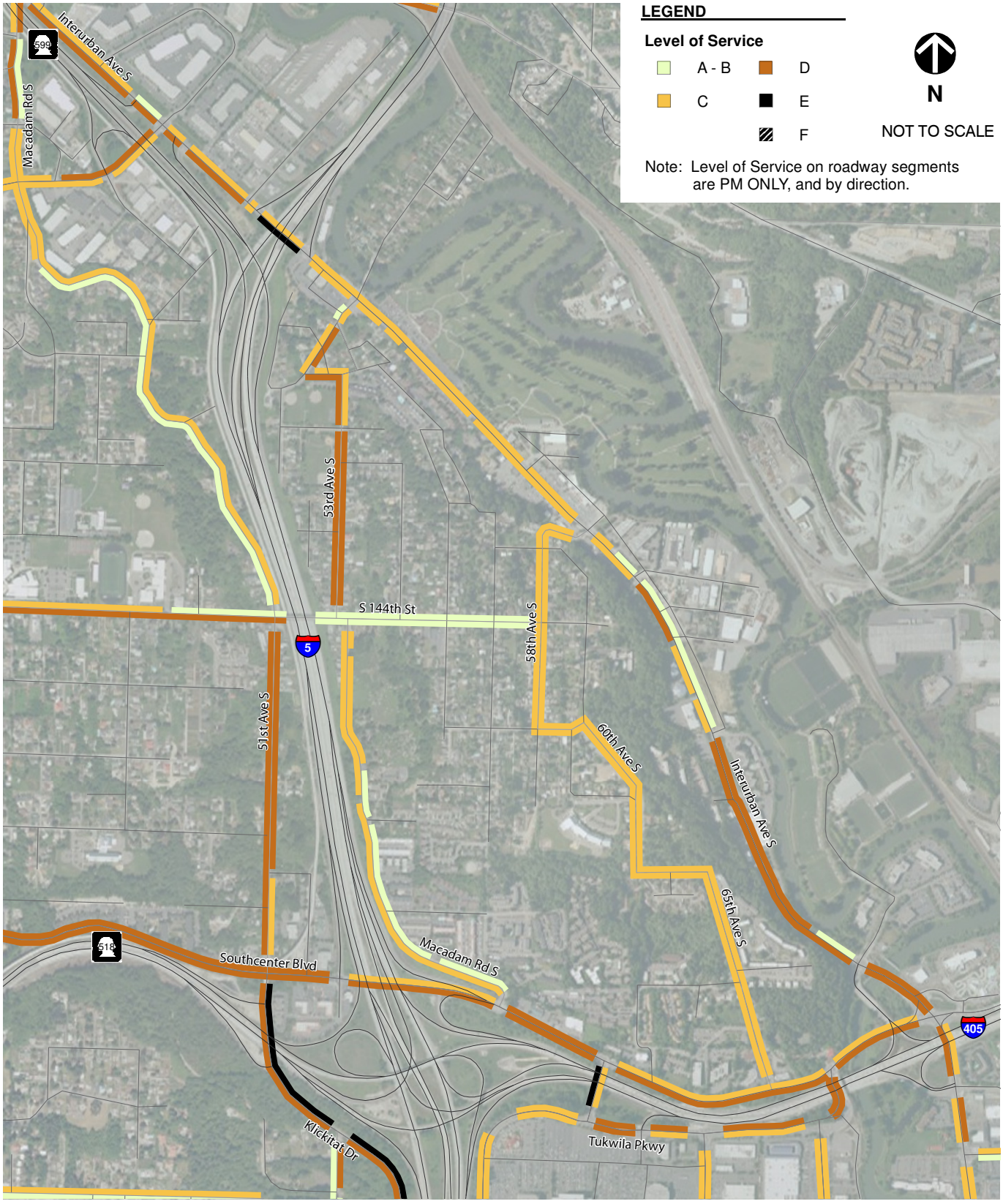


CITY OF TUKWILA - 2010 BICYCLE LEVEL OF SERVICE (SECTION 3)

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig17B_los_zone3_BIKE_hash.mxd

FIGURE 17B

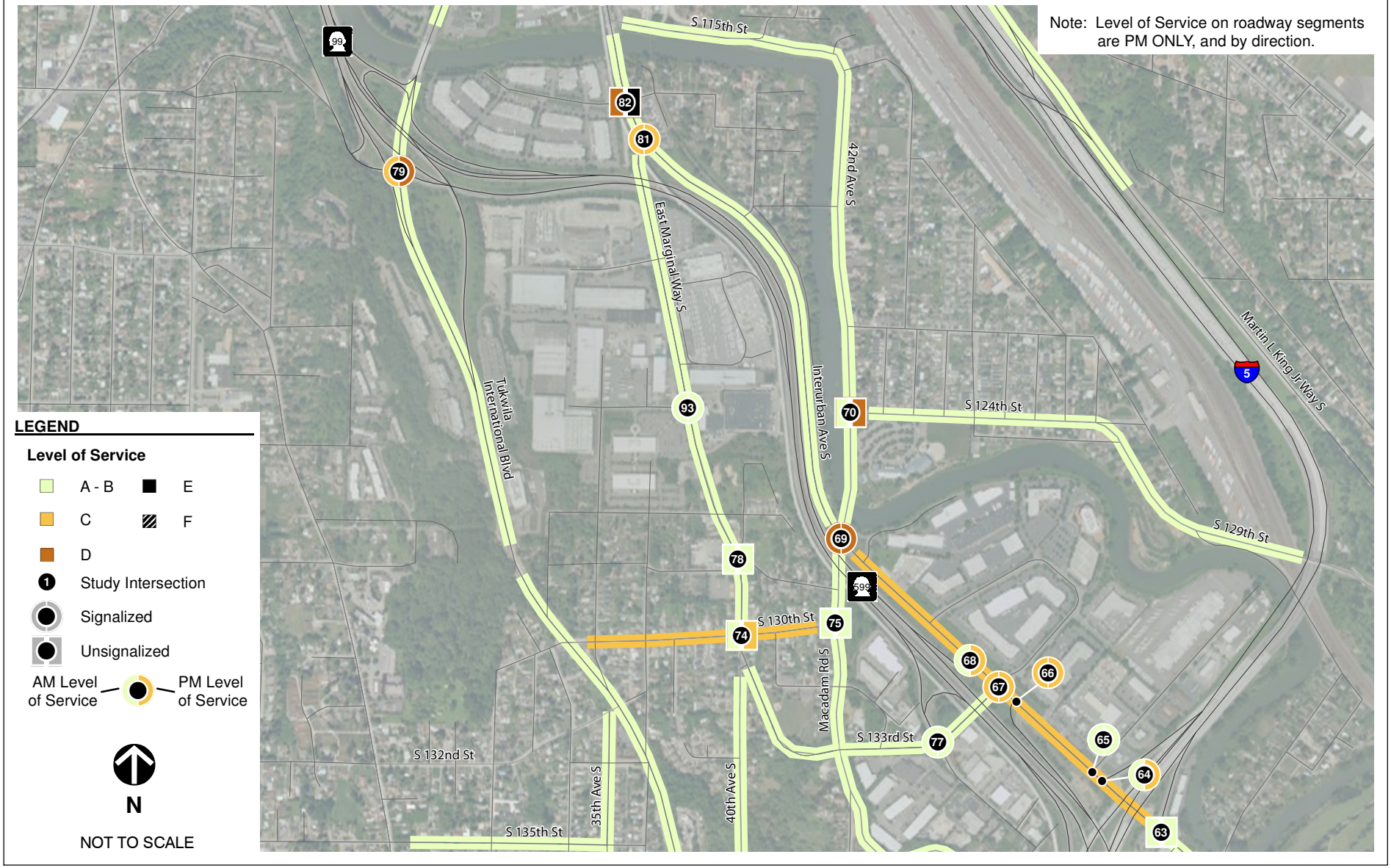


FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig17C_los_zone3_PED_hash.mxd

CITY OF TUKWILA -
2010 PEDESTRIAN LEVEL OF SERVICE
(SECTION 3)

FIGURE 17C

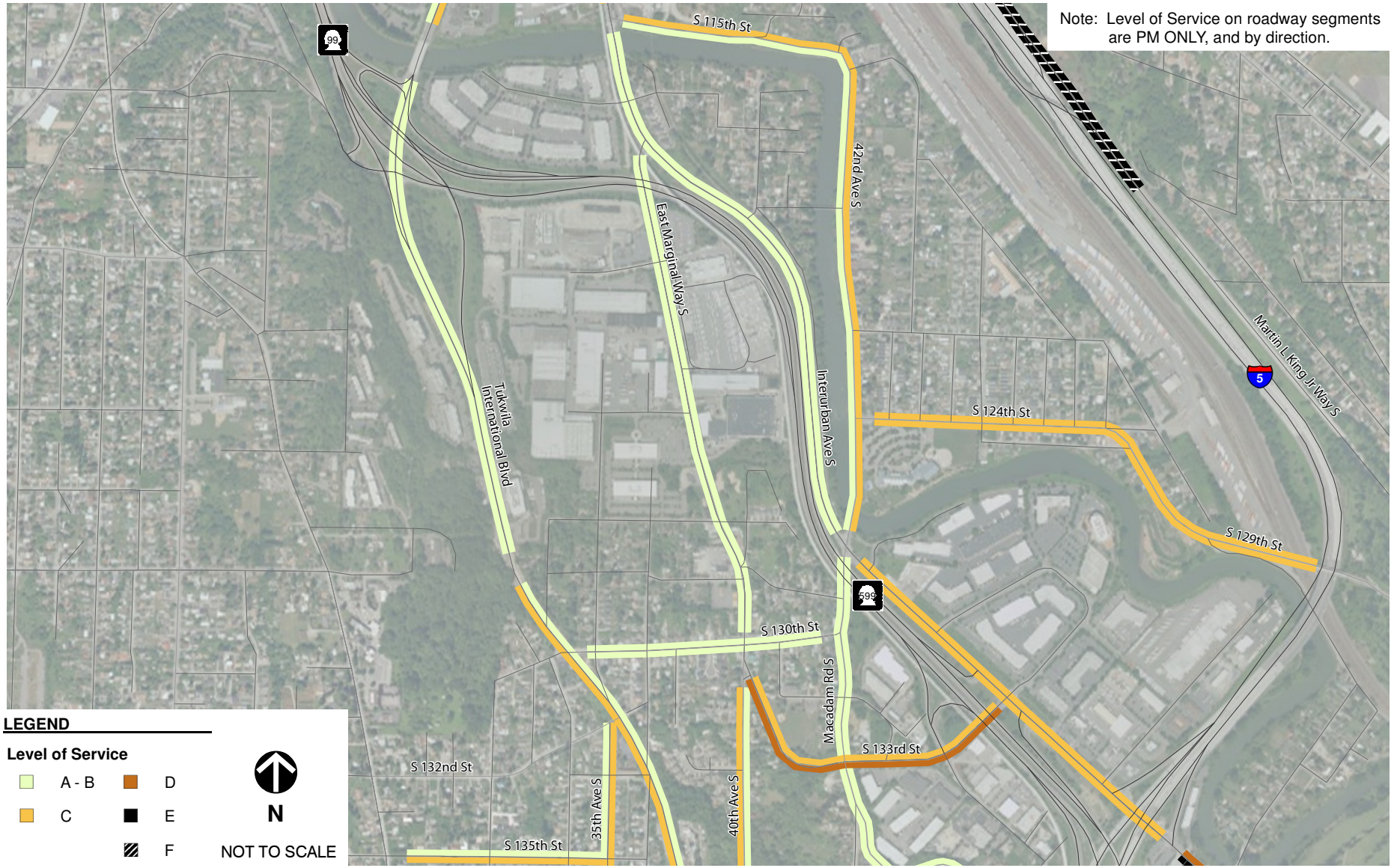


CITY OF TUKWILA - 2010 INTERSECTION AND ROADWAY SEGMENT LEVEL OF SERVICE (SECTION 4)

FIGURE 18A

FEHR & PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig18A_los_sec4_INT_hash.mxd

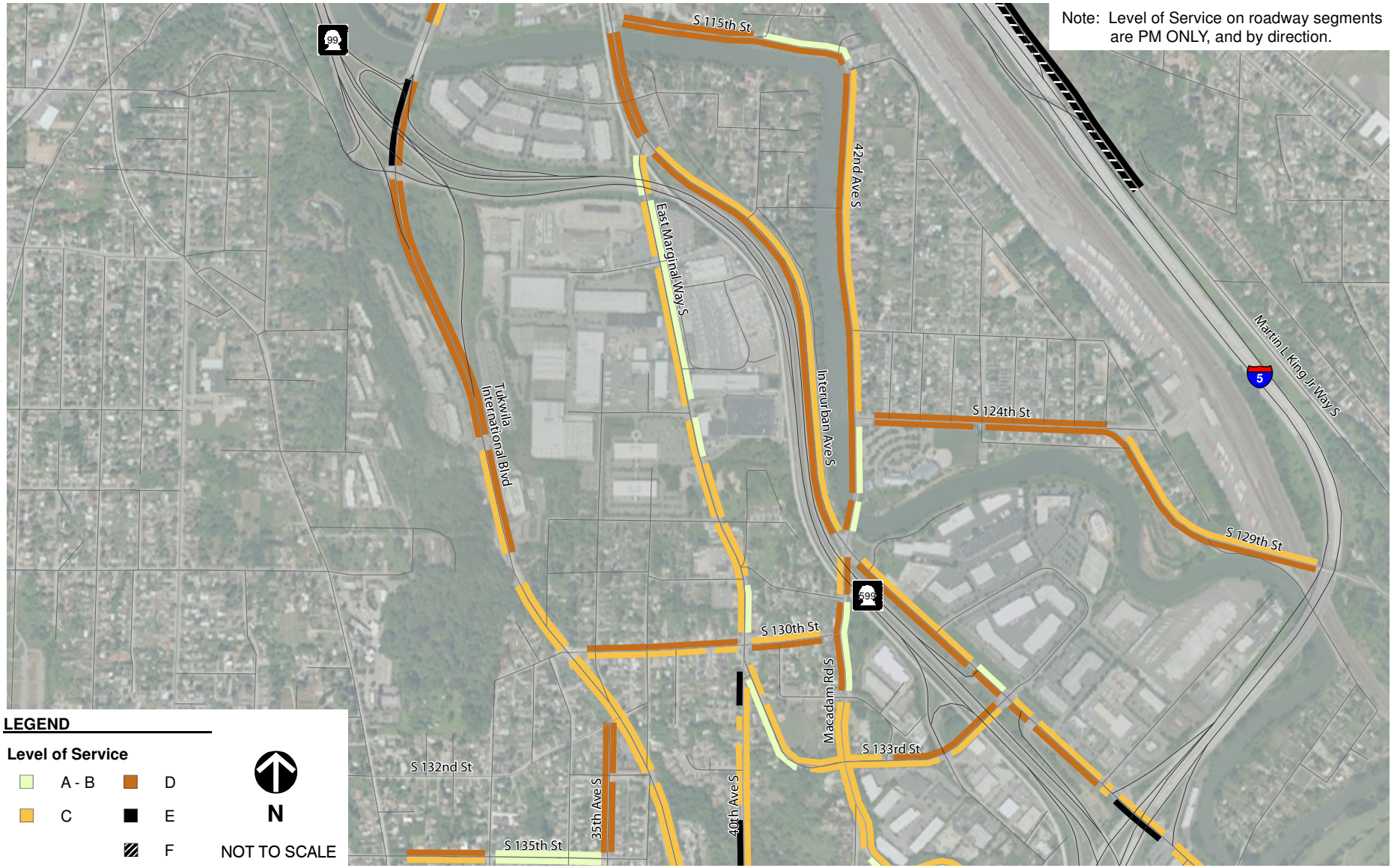


FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig18B_los_zone4_BIKE_hash.mxd

CITY OF TUKWILA - 2010 BICYCLE LEVEL OF SERVICE (SECTION 4)

FIGURE 18B

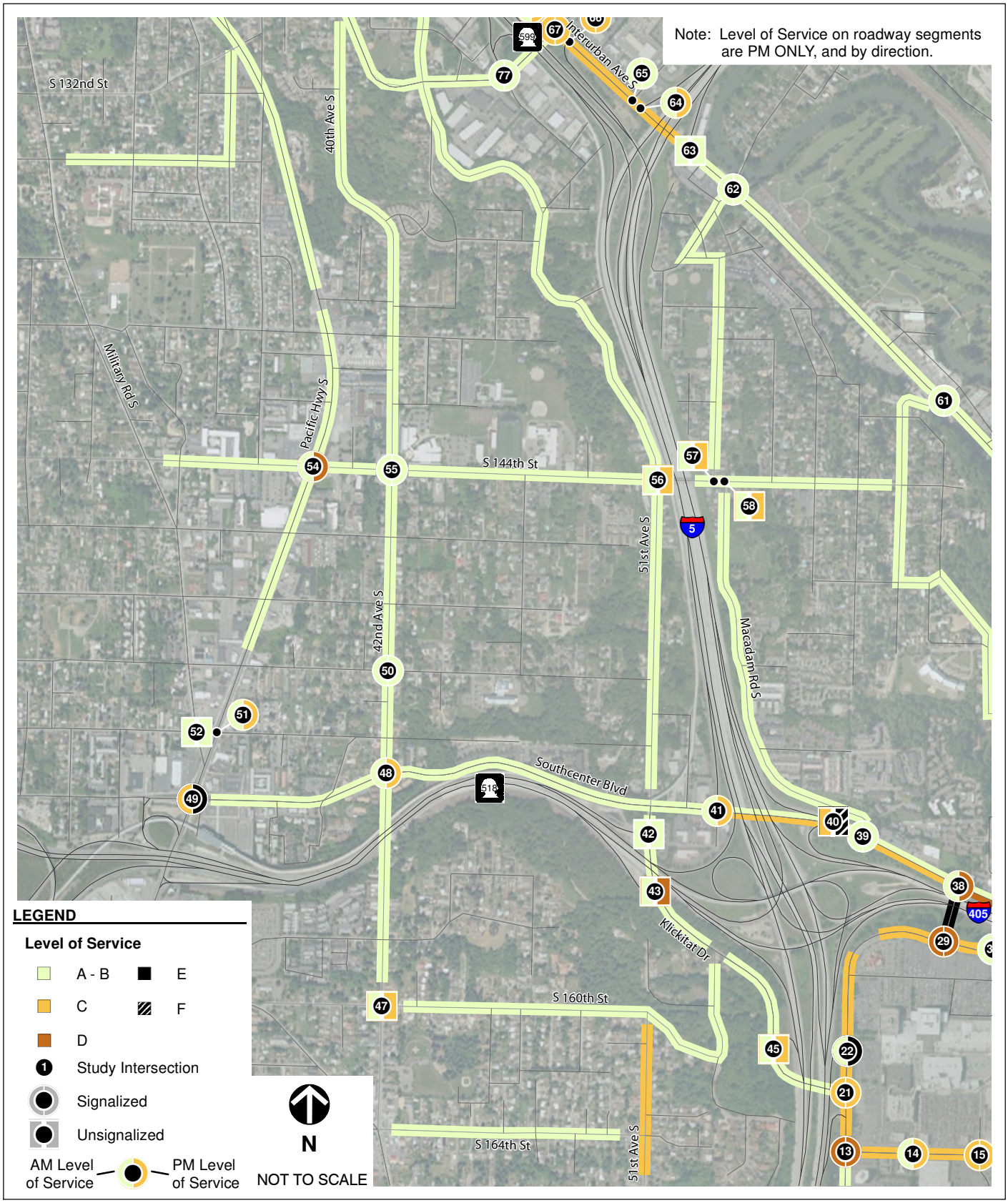


FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig18C_los_zone4_PED_hash.mxd

CITY OF TUKWILA - 2010 PEDESTRIAN LEVEL OF SERVICE (SECTION 4)

FIGURE 18C

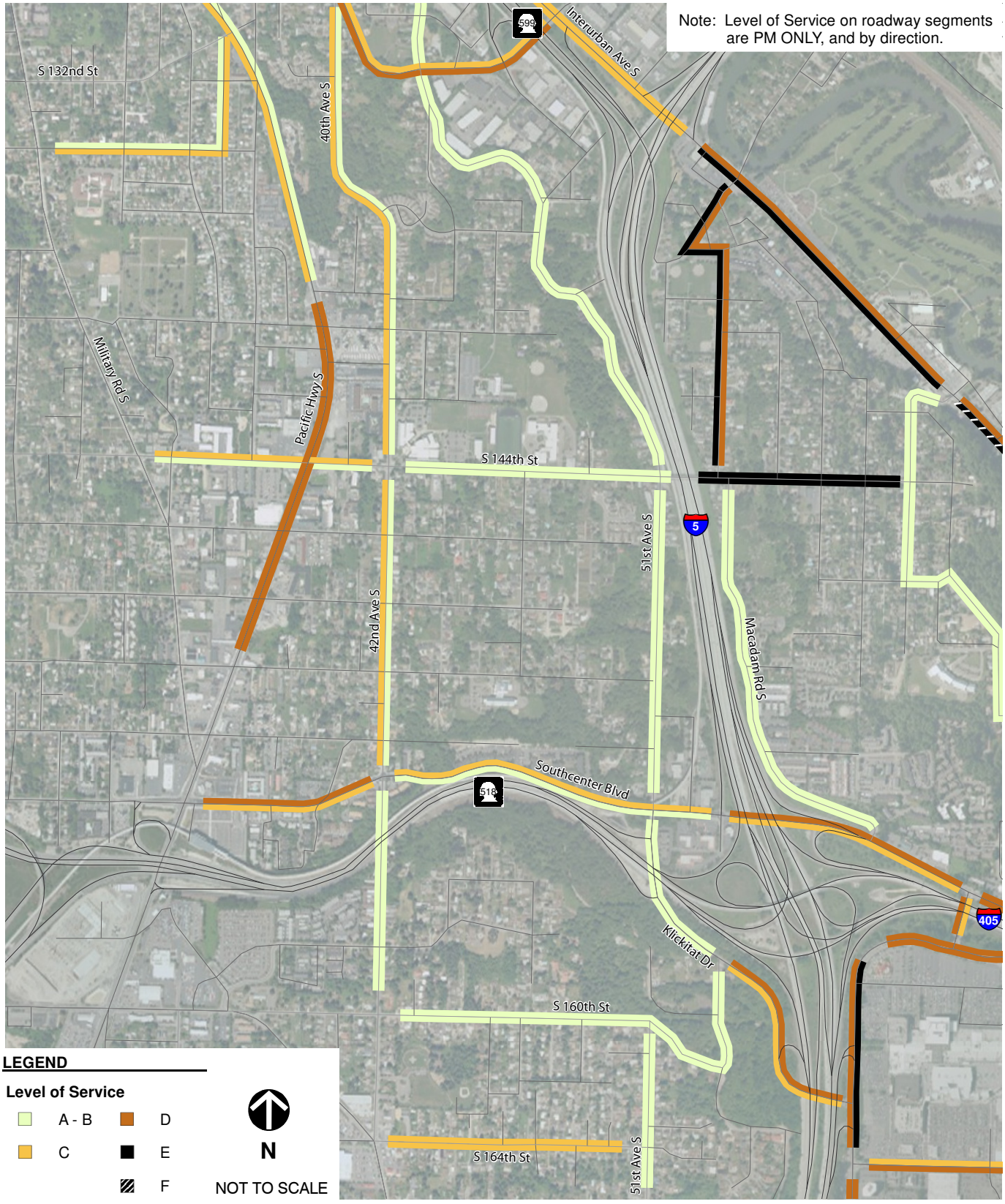


CITY OF TUKWILA - 2010 INTERSECTION AND ROADWAY SEGMENT LEVEL OF SERVICE (SECTION 5)

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig19A_los_sec5_INT_hash.mxd

FIGURE 19A

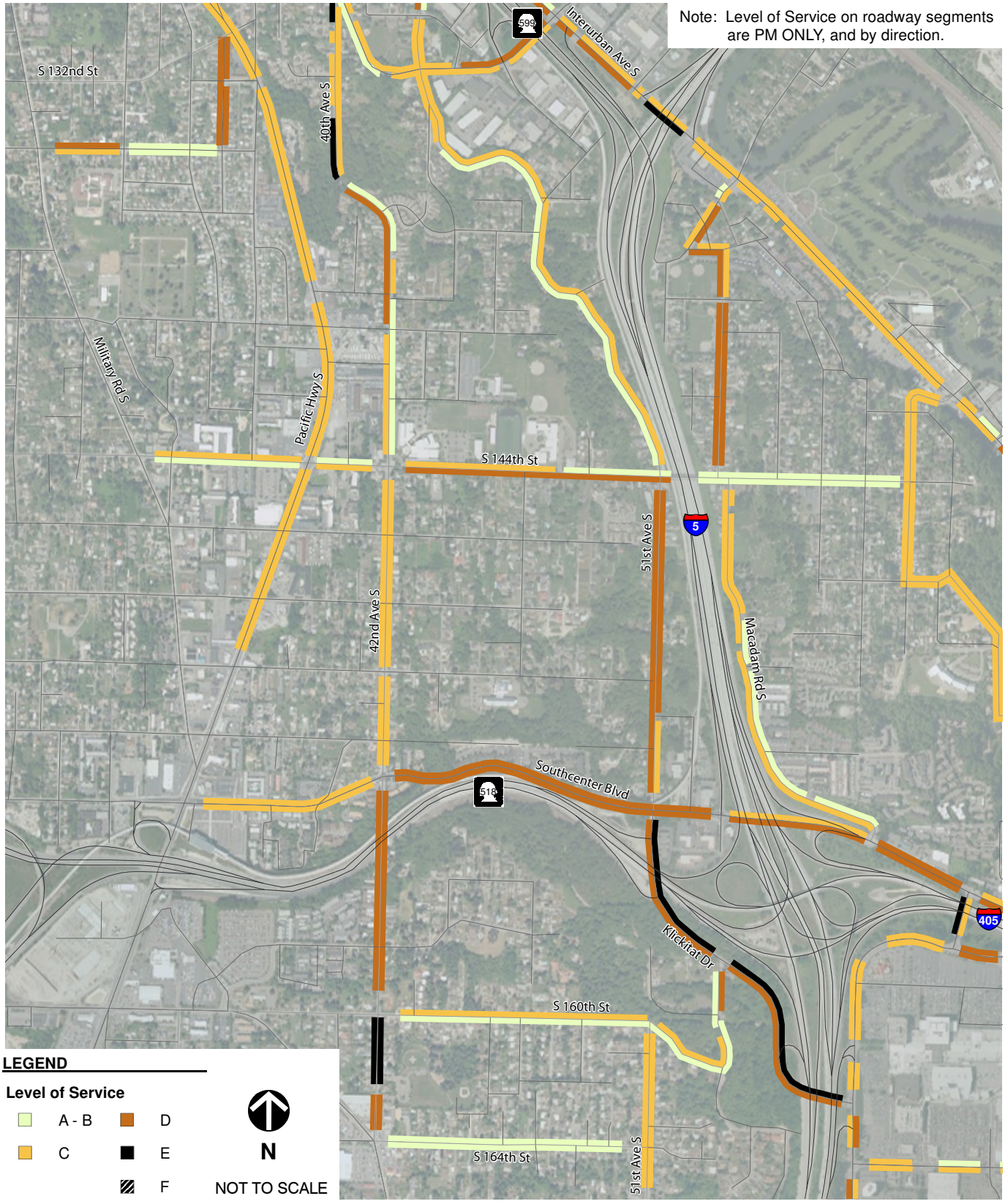


FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig19B_los_zone5_BIKE_hash.mxd

CITY OF TUKWILA -
2010 BICYCLE LEVEL OF SERVICE
(SECTION 5)

FIGURE 19B

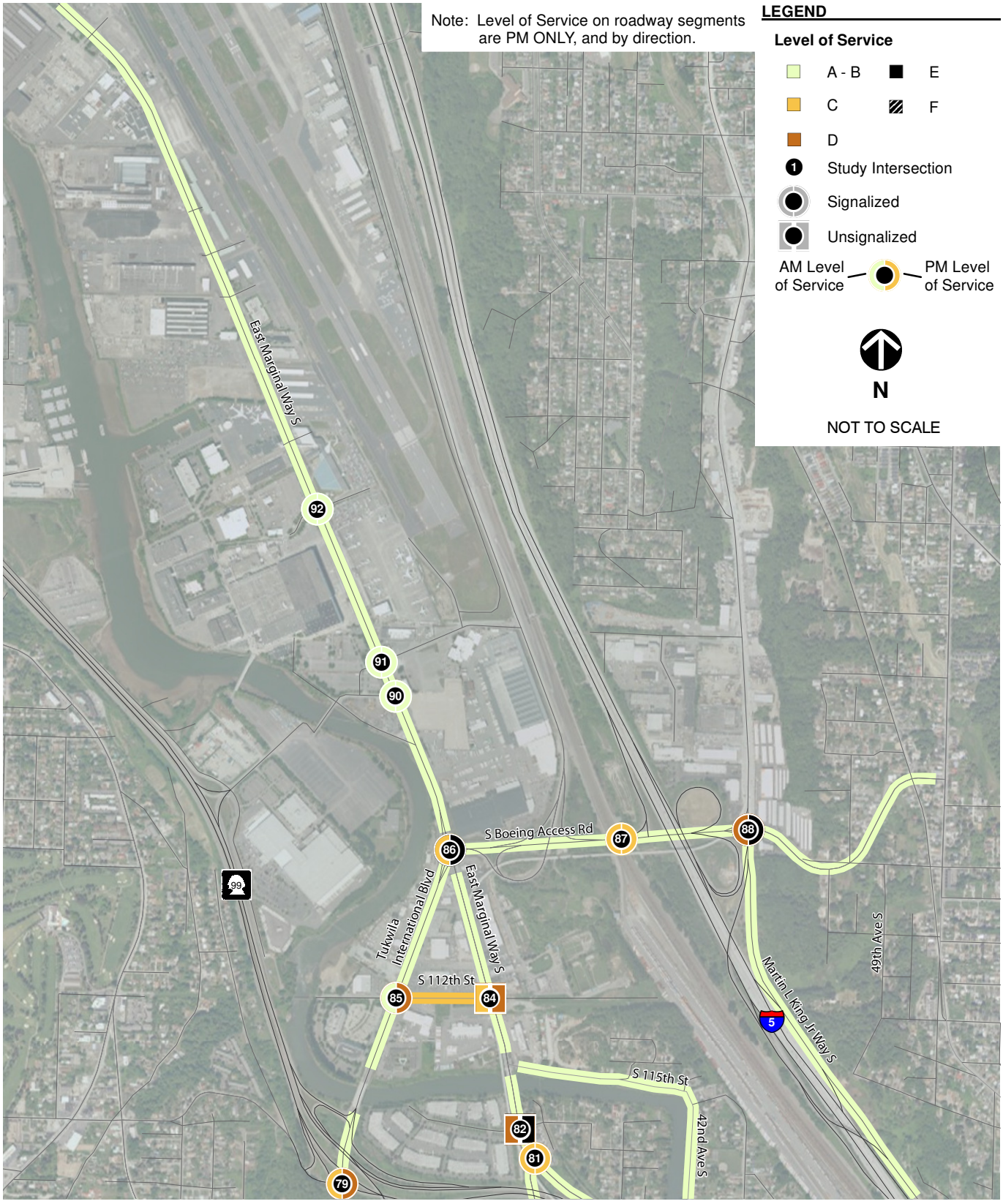


CITY OF TUKWILA - 2010 PEDESTRIAN LEVEL OF SERVICE (SECTION 5)

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig19C_los_zone5_PED_hash.mxd

FIGURE 19C

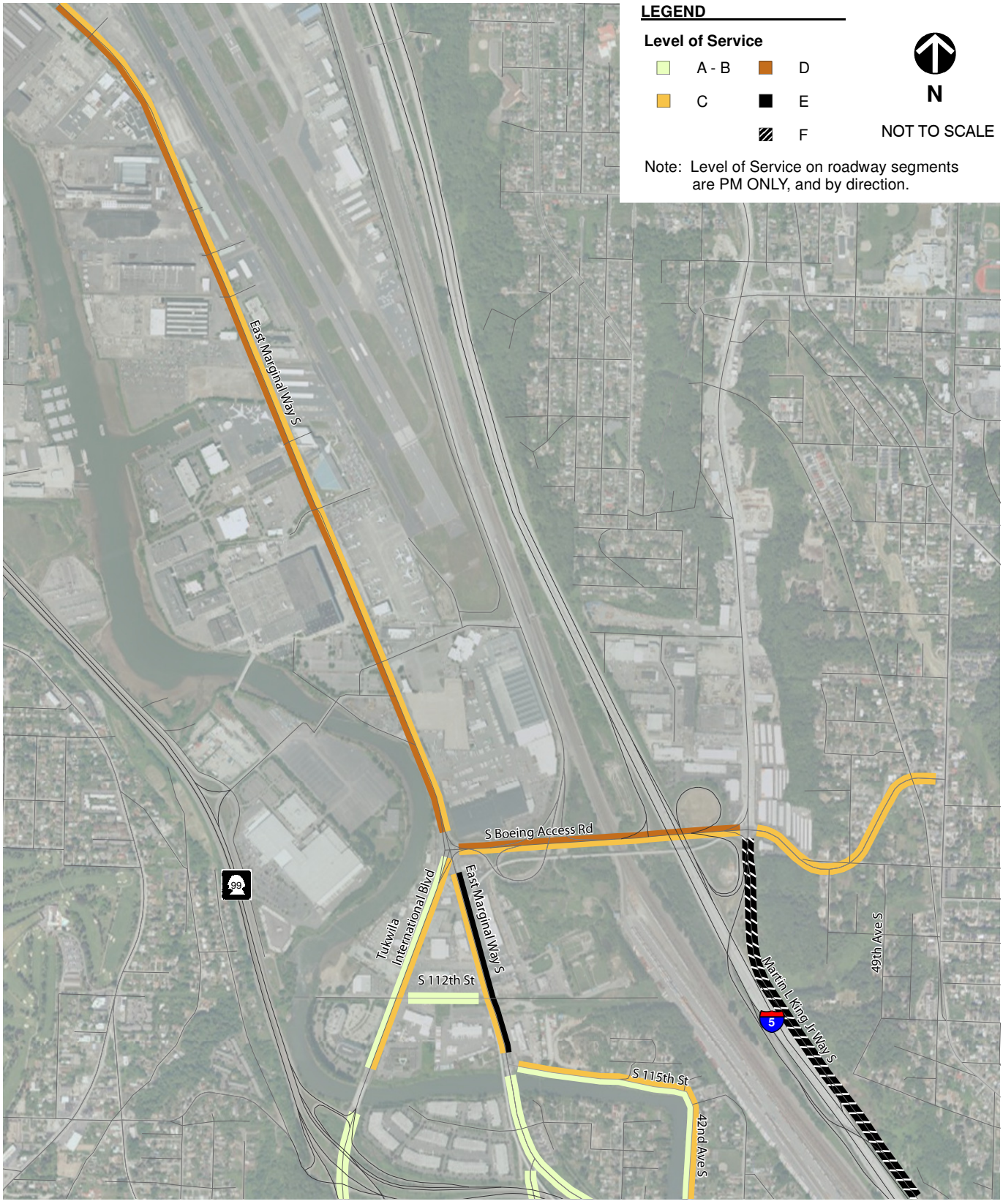


CITY OF TUKWILA - 2010 INTERSECTION AND ROADWAY SEGMENT LEVEL OF SERVICE (SECTION 6)

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig20A_los_sec6_INT_hash.mxd

FIGURE 20A

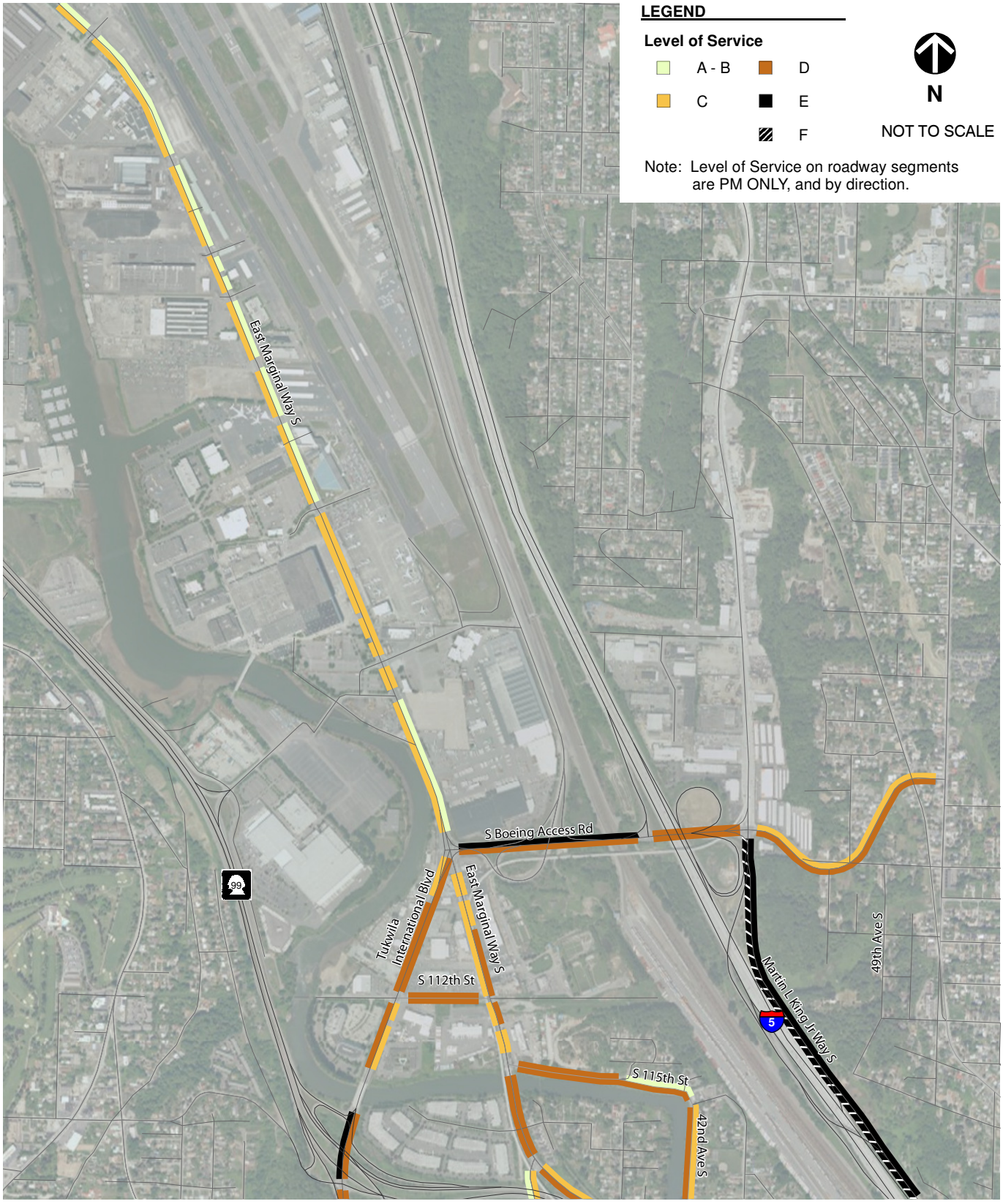


CITY OF TUKWILA - 2010 BICYCLE LEVEL OF SERVICE (SECTION 6)

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig20B_los_zone6_BIKE_hash.mxd

FIGURE 20B



CITY OF TUKWILA -
2010 PEDESTRIAN LEVEL OF SERVICE
(SECTION 6)

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig20C_los_zone6_PED_hash.mxd

FIGURE 20C

Lake Washington

East Marginal Way S

16th Ave S

S 93rd St

S 96th St

Westbound Pedestrian (part)

Northbound Bicycle

S Boeing Access Rd

66

S 112th St

CITY OF TUKWILA

S 115th St

65

49th Ave S

Northbound and Southbound Bicycle and Pedestrian

42nd Ave S

Southbound Pedestrian (part)

Tukwila International Blvd

41

S 124th St

S 129th St

Martin L King Jr Way S

Macadam Rd S

34

S 132nd St

40th Ave S

Southbound Bicycle

Southbound Pedestrian (part)

55

Southbound Bicycle

31

Interurban Ave S

38

53rd Ave S

Military Rd S

S 144th St

37

Southbound Bicycle

Eastbound and Westbound Bicycle

58th Ave S

30

51st Ave

Northbound Automobile; Southbound Pedestrian and Automobile

Eastbound Pedestrian

Southcenter Blvd

33

65th Ave S

Eastbound Pedestrian

22

32

Klickitat Dr

S 160th St

Tukwila Pkwy

Eastbound and Westbound Bicycle

Westbound Pedestrian

19

11

Baker Blvd

25

5

Strander Blvd

Northbound Bicycle

S 164th St

Northbound Bicycle

Southcenter Pkwy

Tukwila Pond

Andover Park W

7

Northbound Bicycle

181

Northbound Bicycle; Northbound (part) and Southbound Pedestrian

Minkler Blvd

23

Westbound Pedestrian (part)

1

Northbound Bicycle

Andover Park E

W Valley Hwy

S 178th St

15

S 180th St

3

12

S 180th St

Westbound Pedestrian

Westbound Bicycle
Eastbound Pedestrian (part)

W Valley

Orilla Rd S

Southcenter Pkwy

S 200th St

S 204th St

LEGEND

- Study Segment
- City of Tukwila
- Potential Annexation Area

Note: Directions used to identify pedestrian segments refer to the sidewalk adjacent to the given direction's traffic flow.

N

NOT TO SCALE

FEHR & PEERS

CITY OF TUKWILA -
STUDY SEGMENTS WITH A BICYCLE, PEDESTRIAN OR AUTOMOBILE LEVEL OF SERVICE OF 'E' OR 'F'

FIGURE 21

Multimodal Segment Level of Service

No roadway segments operate at LOS F for automobiles.

However, four corridors operate at LOS F for bicycles:

- S 180th Street from W Valley Highway to Southcenter Parkway in the westbound direction
- Interurban Avenue S from 58th Avenue S to Southcenter Boulevard in the southbound direction
- Martin Luther King Jr. Way between the east and north city limits in both directions
- Baker Boulevard between Andover Park East and Andover Park West in both directions

One corridor operates at LOS F for pedestrians:

- Martin Luther King Jr. Way from the north city limit to the east city limit in the southbound direction

Intersection Level of Service

The LOS results for the weekday morning and afternoon peak hours are shown in **Table 12.** For this study, the peak hour is defined by the highest traffic volumes for one hour during a given peak period as follows: For weekdays - 7 to 10 AM for the morning; 11 AM to 2 PM for midday; 4 to 7 PM for the afternoon peak period and for the weekend - 12 to 3 PM on Saturday.

In the AM peak period, all but two of the signalized intersections operate at LOS C or better and no signalized intersections operate at LOS F. The two intersections operating at LOS E are:

- Intersection 34, Southcenter Boulevard and W Valley Highway
- Intersection 69, 42nd Avenue S and Interurban Avenue S

In the morning, the only unsignalized intersection that falls below LOS D is S 133rd Street at the SR 599 ramps which operates at LOS F.

During the PM peak hour, nearly 90 percent of signalized intersections operate at LOS D or better. Two intersections operate at LOS F and four operate at LOS E. These intersections include:

- Intersection 5, S 180th Street and W Valley Highway (LOS F)
- Intersection 34, Southcenter Boulevard and W Valley Highway (LOS F)
- Intersection 10, Minkler Boulevard and Andover Park West (LOS E)
- Intersection 13, Strander Boulevard and Southcenter Parkway (LOS E)
- Intersection 15, Strander Boulevard and 61st Place S (LOS E)
- Intersection 16, Strander Boulevard and Andover Park West (LOS E)

There are five unsignalized intersections that operate at LOS F and two that operate at LOS E during the PM peak hour:

- Intersection 55, S 144th Street and 42nd Avenue S (LOS F)

- Intersection 77, S 133rd Street and SR 599 Ramps (LOS F)
- Intersection 28, Tukwila Parkway and the Northwest Mall Driveway (LOS F)
- Intersection 26, Andover Park West and Northeast Mall Driveway (LOS F)
- Intersection 20, Andover Park West and the Tire Center Driveway (LOS F)
- Intersection 82, S 116th Street and E Marginal Way (LOS E)
- Intersection 25, Southcenter Parkway and Northwest Mall Driveway (LOS E)

TABLE 12 – 2010 AM AND PM PEAK INTERSECTION LEVEL OF SERVICE

ID	Location	AM Peak		PM Peak	
		Delay (seconds)	LOS	Delay (seconds)	LOS
Signalized					
1	S 180th Street / Southcenter Parkway	9.1	A	53.5	D
2	S 180th Street / Andover Park W	18.4	B	43.3	D
3	S 180th Street / Andover Park E	5.7	A	21.4	C
4	S 180th Street / Sperry Drive	9.3	A	31.0	C
5	S 180th Street / W Valley Highway	33.0	C	121.6	F
6	S 180th Street / 72nd Avenue S	6.2	A	12.7	B
7	Saxon Drive / Andover Park E	5.6	A	8.5	A
9	Minkler Boulevard / Southcenter Parkway	3.7	A	13.5	B
10	Minkler Boulevard / Andover Park W	20.3	C	62.3	E
11	Minkler Boulevard / Andover Park E	15.5	B	18.6	B
12	S 168th Street / Southcenter Parkway	1.9	A	5.6	A
13	Strander Boulevard / Southcenter Parkway	12	B	56.5	E
14	Strander Boulevard / Southcenter Mall SW Driveway	2.5	A	54.9	D
15	Strander Boulevard / 61st Place S	7.1	A	65.6	E
16	Strander Boulevard / Andover Park W	11	B	56	E
17	Strander Boulevard / Andover Park E	16.8	B	39.4	D
18	Strander Boulevard / W Valley Parkway	15.7	B	38.5	D
19	Wig Boulevard / Southcenter Boulevard	1.0	A	7	A
21	Klickitat Drive / Southcenter Parkway	10	A	36.1	D
22	I-5 Exit 153 Off-ramp / Southcenter Parkway	7.5	A	34.1	C
23	Baker Boulevard / Andover Park W	3.4	A	16	B
24	Baker Boulevard / Andover Park E	6.7	A	15.7	B
27	Longacres Way / W Valley Highway	12.5	B	14	B
29	Tukwila Parkway / 61st Avenue S	14.9	B	27.0	C
30	Tukwila Parkway / I-405 NB On-ramp	2.1	A	14.2	B
31	Tukwila Parkway / Andover Park W	5.8	A	23.9	C
32	Tukwila Parkway / Andover Park E	8.9	A	24.3	C

TABLE 12 – 2010 AM AND PM PEAK INTERSECTION LEVEL OF SERVICE

ID	Location	AM Peak		PM Peak	
		Delay (seconds)	LOS	Delay (seconds)	LOS
33	I-405 NB Ramps / W Valley Highway	26.6	C	21.7	C
34	Southcenter Boulevard / W Valley Highway	62.5	E	176.6	F
35	I-405 SB Ramps / W Valley Highway	26.7	C	40.9	D
36	Southcenter Boulevard / 68th Avenue S	15.3	B	47.2	D
38	Southcenter Boulevard / 61st Avenue S	10.9	B	42.6	D
39	Southcenter Boulevard / Macadam Rd. S	9.7	A	8.6	A
41	Southcenter Boulevard / I-5 SB Off-ramp	14.3	B	20.7	C
48	Southcenter Boulevard / 42nd Avenue S	16.5	B	21.2	C
49	Southcenter Boulevard / Tukwila International Boulevard	23.3	C	39.2	D
50	S 150th Street / 42nd Avenue S	8.6	A	6.4	A
51	S 152nd Street / Tukwila International Boulevard	16.3	B	23	C
54	S 144th Street / Tukwila International Boulevard	17.1	B	29.1	C
61	58th Avenue S / Tukwila International Boulevard	8.2	A	9.1	A
62	52nd Avenue S / Interurban Avenue S	10.9	B	10.1	B
64	I-5 SB Off-ramp / Interurban Avenue S	14.3	B	16.8	B
65	48th Avenue S / Interurban Avenue S	9.3	A	11.8	B
66	SR-599 Off-ramp / Interurban Avenue S	24.7	C	24.3	C
67	Gateway Drive / Interurban Avenue S	26.9	C	34.4	C
68	SR-599 NB On-ramp / Interurban Avenue S	4.9	A	17.4	B
69	42nd Avenue S / Interurban Avenue S	64.6	E	40.1	D
79	S 116th Way / Tukwila International Boulevard	21	C	31.2	C
81	E Marginal Way / Interurban Avenue S	26	C	30.2	C
85	S 112th Street / Tukwila International Boulevard	10.2	B	23.8	C
86	Boeing Access Road / E Marginal Way	22.2	C	44.6	D
87	Boeing Access Road / I-5 SB Off-ramp	30.9	C	21	C
88	Boeing Access Road / Martin Luther King Way	34	C	48.4	D
90	S 102nd Street / E Marginal Way	3.5	A	7	A
91	S Norfolk Street / E Marginal Way	6.2	A	6.8	A
92	S 96th Pl. / E Marginal Way	5.1	A	15.4	B
93	S 124th Street / E Marginal Way	6.6	A	21.4	C
Unsignalized					
37	Southcenter Boulevard / 65th Ave S	15.7	C	27.7	D
40	Southcenter Boulevard / I-405 SB Off-ramp	7.1	A	28.8	D
42	SR 518 WB On-ramp / Klickitat Drive	7	A	10.4	B
43	SR 518 EB Off-ramp / Klickitat Drive	13.3	B	24.1	C
45	I-5 SB On-ramp / Klickitat Drive	8.1	A	15.6	C

TABLE 12 – 2010 AM AND PM PEAK INTERSECTION LEVEL OF SERVICE

ID	Location	AM Peak		PM Peak	
		Delay (seconds)	LOS	Delay (seconds)	LOS
47	S. 160th Street / 42nd Avenue S	10.8	B	19.1	C
52	Military Road S / 152nd Street S	8.0	A	9.6	A
55	S 144th Street / 42nd Avenue S	9.2	A	53.6	F
56	S 144th Street / Macadam Road S	9.2	A	14.1	B
57	S 144th Street / 53rd Avenue S	10.3	B	12.1	B
58	S 144th Street / Macadam Road S	10.9	B	12.3	B
63	I-5 NB On-ramp / Interurban Avenue S	13	B	12.0	B
70	S 124th Street / 42nd Avenue S	13.4	B	24.1	C
74	S 130th Street / East Marginal Way	13.5	B	15.8	C
75	S 130th Street / Macadam Rd S	9.8	A	10.4	B
77	S 133rd Street / SR 599 Ramps	>150	F	>150	F
78	128th Street S / E Marginal Way	14.1	B	13.6	B
82	S 116th Street / E Marginal Way	28.9	D	41.9	E
84	S 112th Street / E Marginal Way	19.6	C	21.7	C
20	Andover Park W / Tire Center Driveway	6	A	93.5	F
25	Southcenter Parkway / Northwest Mall Driveway	6.4	A	35.3	E
26	Andover Park W / Northeast Mall Driveway	6.4	A	21.1	C
28	Tukwila Parkway / Northwest Mall Driveway	6	A	>150	F
95	Andover Park W / Southeast Mall Driveway	4.3	A	52.9	F

Fehr & Peers, 2010.

Intersections within Southcenter were analyzed in the midday of both weekdays and Saturday. The LOS results are shown in **Table 13** and **Figure 22**. Midday LOS is good in most locations with all but two intersections operating at LOS D or better. The intersection of Tukwila Parkway and the Northwest Mall Driveway operates at LOS F.

On Saturday, all signalized intersections operate at LOS D or better, but two unsignalized intersections operate at LOS F:

- Southcenter Parkway and the Northwest Mall Driveway
- Tukwila Parkway and the Northwest Mall Driveway

TABLE 13 – 2010 MIDDAY AND SATURDAY INTERSECTION LEVEL OF SERVICE

ID	Location	Midday		Saturday	
		Delay (seconds)	LOS	Delay (seconds)	LOS
Signalized					
1	S 180th Street / Southcenter Parkway	27.9	C	21.0	C
9	Minkler Boulevard / Southcenter Parkway	21.0	C	22.3	C
12	S 168th Street / Southcenter Parkway	8.8	A	5.6	A
13	Strander Boulevard / Southcenter Parkway	33.7	C	52.0	D
14	Strander Boulevard / Southcenter Mall SW Driveway	12.6	B	30.7	C
15	Strander Boulevard / 61st Place S	20.7	C	30.6	C
16	Strander Boulevard / Andover Park W	35.7	D	45.5	D
19	Wig Boulevard / Southcenter Boulevard	9.0	A	9.6	A
21	Klickitat Drive / Southcenter Parkway	22.5	C	37.3	D
22	I-5 Exit 153 Off-ramp / Southcenter Parkway	24.0	C	41.8	D
23	Baker Boulevard / Andover Park W	15.1	B	15.6	B
29	Tukwila Parkway / 61st Avenue S	32.5	C	32.0	C
30	Tukwila Parkway / I-405 NB On-ramp	11.1	B	20.2	C
31	Tukwila Parkway / Andover Park W	16.1	B	19.0	B
38	Southcenter Boulevard / 61st Avenue S	48.0	D	49.0	D
Unsignalized					
20	Andover Park W / Tire Center Driveway	14.6	B	24.8	C
25	Southcenter Parkway / Northwest Mall Driveway	47.7	E	88.0	F
26	Andover Park W / Northeast Mall Driveway	32.5	D	25.2	D
28	Tukwila Parkway / Northwest Mall Driveway	120.8	F	>150	F
95	Andover Park W / Southeast Mall Driveway	21.9	C	39.5	E

Fehr & Peers, 2010.

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig22_los_zone1_MID_SAT2_arc10.mxd

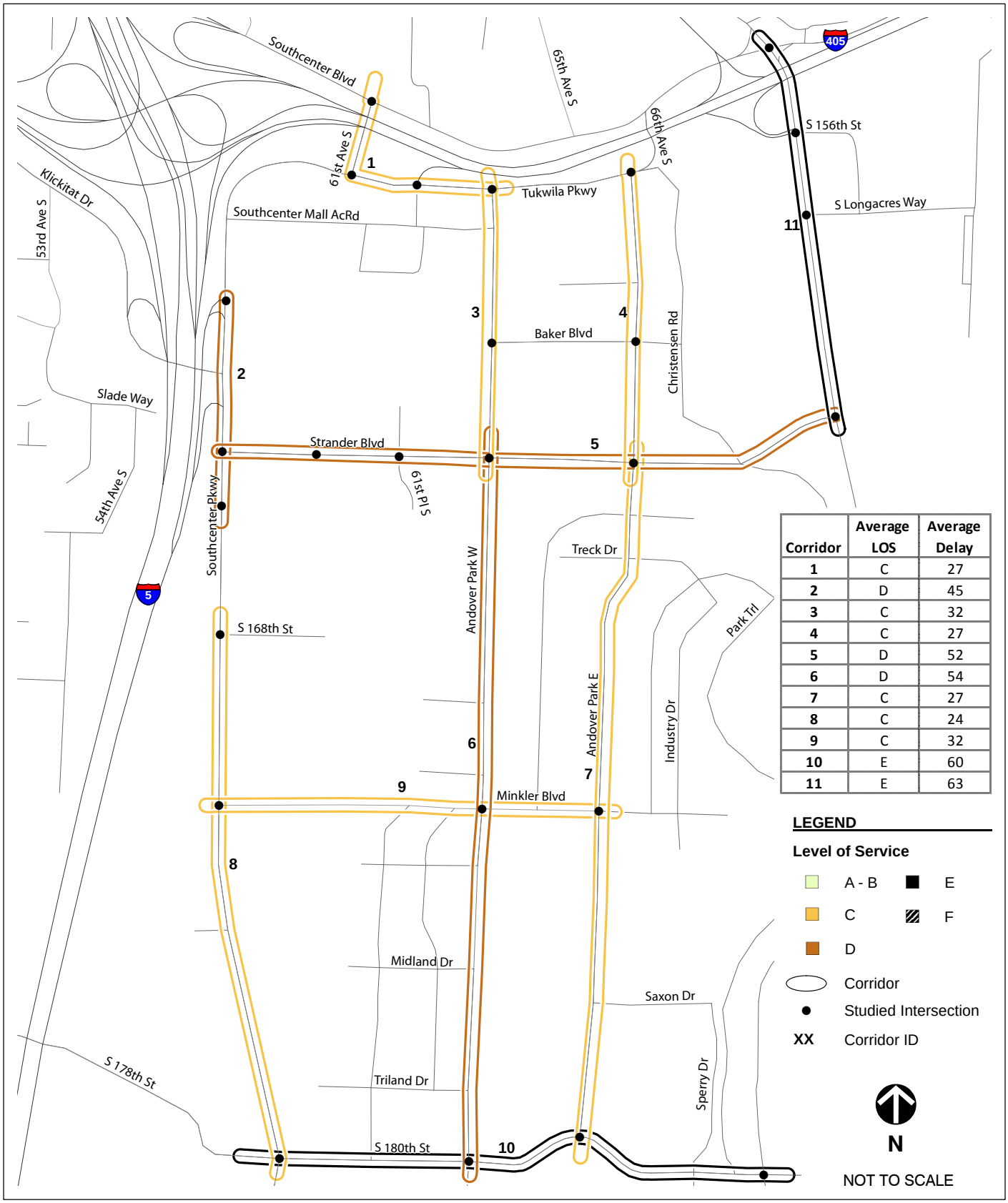
CITY OF TUKWILA -
2010 MIDDAY AND SATURDAY
INTERSECTION LEVEL OF SERVICE
FOR SOUTHCENTER AREA

FIGURE 22

Southcenter Corridor Level of Service

Figure 23 displays the corridor level of service for the Southcenter area using the methodology established in the 2005 Comprehensive Plan Update. Calculations for the corridor level are shown in **Table 14**. All eleven Southcenter corridors operate at LOS E or better, meeting concurrency standards. Nine corridors operate at LOS D or better; the two corridors operating at LOS E are:

- S 180th from Southcenter Parkway to W Valley Highway (Corridor #10)
- W Valley Highway from Southcenter Boulevard to Strander Boulevard (Corridor #11)



Corridor	Average LOS	Average Delay
1	C	27
2	D	45
3	C	32
4	C	27
5	D	52
6	D	54
7	C	27
8	C	24
9	C	32
10	E	60
11	E	63

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig23_LOS_Corridors_2010.mxd

CITY OF TUKWILA - 2010 SOUTHCENTER CORRIDOR LEVEL OF SERVICE

FIGURE 23

TABLE 14 – 2010 SOUTHCENTER CORRIDOR LEVEL OF SERVICE

Corridor ID	Location	Intersection ID	Control Delay	Average Delay	Average LOS
1	61st Avenue S Bridge/Tukwila Parkway from Southcenter Boulevard to Andover Park W	29	27.0	26.9	C
		30	14.2		
		31	23.9		
		38	42.6		
2	Southcenter Parkway/Strander Boulevard from Nordstrom Entrance to 61st Place S[1]	13	56.5	45.3	D
		22	34.1		
3	Andover Park W from Tukwila Parkway to Strander Boulevard	16	56.0	32.0	C
		23	16.0		
		31	23.9		
4	Andover Park E from Tukwila Parkway to Strander Boulevard	17	39.4	26.5	C
		24	15.7		
		32	24.3		
5	Strander Boulevard from Southcenter Parkway to W Valley Highway	13	56.5	51.8	D
		14	54.9		
		15	65.6		
		16	56.0		
		17	39.4		
		18	38.5		
6	Andover Park W from Strander Boulevard to S 180th Street	2	43.3	53.9	D
		10	62.3		
		16	56.0		
7	Andover Park E from Strander Boulevard to S 180th Street	3	21.4	26.5	C
		11	18.6		
		17	39.4		
8	Southcenter Parkway from S 168th Street to S 180th Street	1	53.5	24.2	C
		9	13.5		
		12	5.6		
9	Minkler Boulevard from Southcenter Parkway to Andover Park E	9	13.5	31.5	C
		10	62.3		
		11	18.6		
10	S 180th Street from Southcenter Parkway to W Valley Highway	1	53.5	60.0	E
		2	43.3		
		3	21.4		
		5	121.6		
11	W Valley Highway from Southcenter Boulevard to Strander Boulevard	18	38.5	62.7	E
		27	14.0		
		33	21.7		
		34	176.6		

[1] This corridor also contains a new traffic signal at the Double Tree Hotel entrance. When counts were taken, this signal was not in operation.

Fehr & Peers, 2010.

This page intentionally left blank.

CHAPTER 3. 2030 FORECAST ASSUMPTIONS AND METHODOLOGY

The previous chapter summarized existing transportation conditions (2010) focused on vehicle, pedestrian, and bicycle modes. The following three chapters of this document describe the operations of the transportation system under 2030 conditions. Future traffic operation conditions were analyzed using the quantitative methods described in the existing conditions document. Using the results of the 2030 operation analyses, recommendations to improve the transportation system in the City were developed.

This chapter describes the assumed changes in land use patterns and the transportation network changes that are expected between now and 2030. The process to update the travel model is also described.

The next chapter describes the projected traffic LOS results for the study intersections across the City. Analysis periods include the AM and PM peak hours, as well as weekday midday, and Saturday peak hours in the Southcenter area. The purpose of the Chapter 4 analysis is to identify traffic deficiencies that would occur between now and 2030, without additional roadway improvements. Pedestrian and bicycle LOS analysis was not prepared in 2030 since, unlike auto LOS, pedestrian and bicycle LOS are not based on their demands. Therefore, if no physical changes are anticipated between now and 2030, the pedestrian and bicycle LOS will approximately be the same as the existing conditions.

The last chapter provides a list of recommended projects designed to improve pedestrian, bicycle, and auto LOS. The recommended projects are prioritized based on the LOS improvement needs, funding availability, potential for grant funding opportunities, and the City's land use goals.

LAND USE ASSUMPTIONS

Land use forecasts for 2030 are provided by the Puget Sound Regional Council (PSRC) and are based on regional population and employment growth forecasts. **Table 15** summarizes the citywide forecasts for total households and employment and compares the 2030 forecasts to the 2010 land use estimates that were used to calibrate the travel model. **Figures 24** and **25** summarize the growth in households and employment in each Traffic Analysis Zone (TAZ) within the City.

TABLE 15 – 2010 AND 2030 LAND USE SUMMARY FOR CITY OF TUKWILA

	2010	2030	Percent Growth
Total Households	7,440	12,300	65%
Employment (workers)	47,540	75,210	58%

Source: City of Tukwila, 2011.

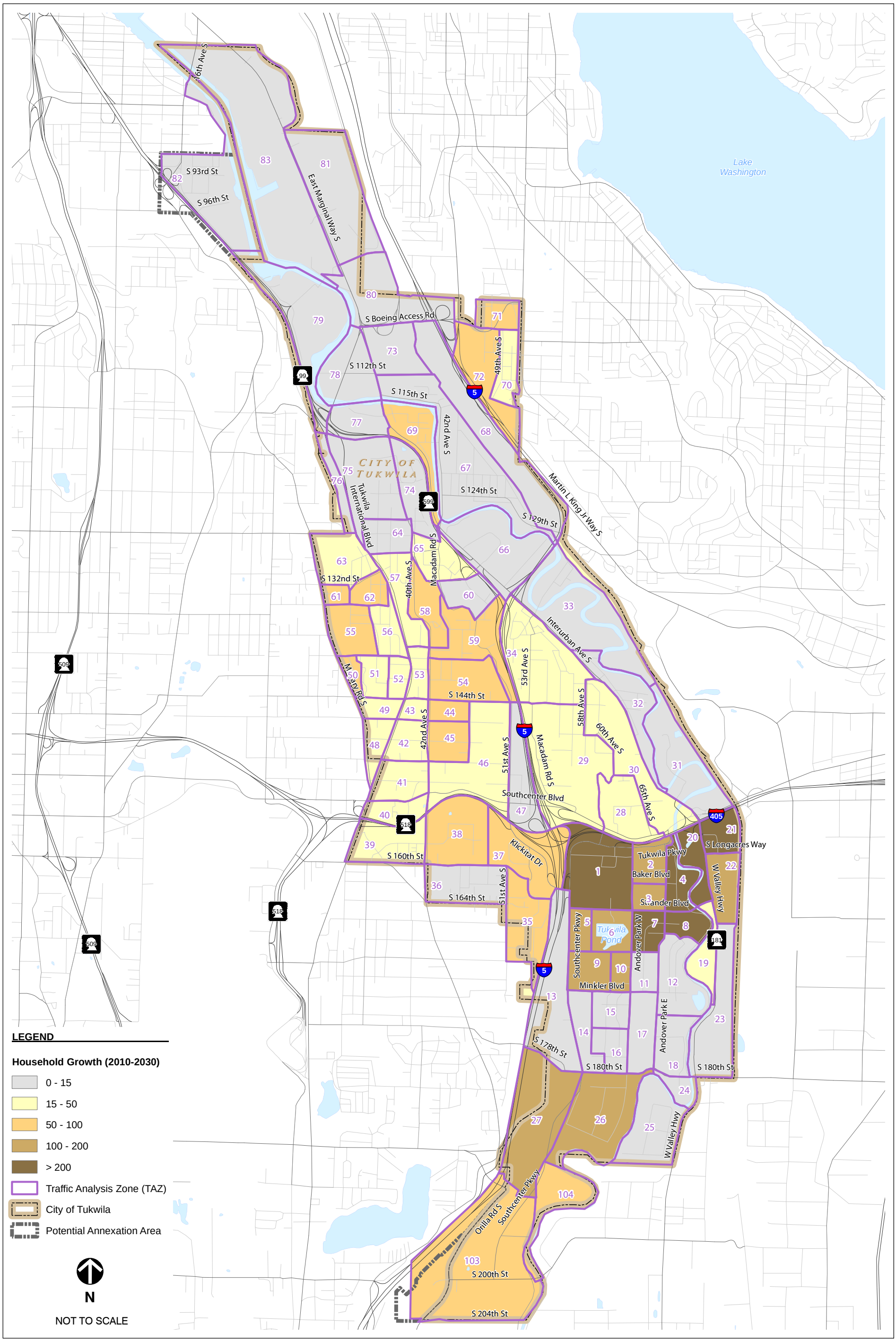
As described in the existing conditions document, the Tukwila travel demand forecasting model has a finer land use zone system (TAZs) than the PSRC travel model. This additional level of detail allows the travel demand forecasting model to produce more accurate results; however, an additional step is required to develop the fine-grained land use forecasts.

As shown in the table above, households and employment in Tukwila are expected to grow by 65 and 58 percent, respectively, over the next 20 years. This estimate is based on the PSRC growth forecasts for the regional model TAZs within the City. In order to accommodate the City's higher resolution TAZ system, Tukwila staff allocated the PSRC growth to each TAZ in the city based on the availability of vacant and redevelopable lands. As shown in **Figures 24** and **25**, substantial development is expected in

the Tukwila South area, between S 180th and S 200th Streets. In that area, approximately 400 new households and 13,000 new jobs are expected to be added by 2030. Other major growth areas include:

- Southcenter – 1,400 new households and 4,200 new jobs
- North West Valley Highway Corridor – 1,400 new households and 300 new jobs
- Boeing Field Area – 1,800 new jobs

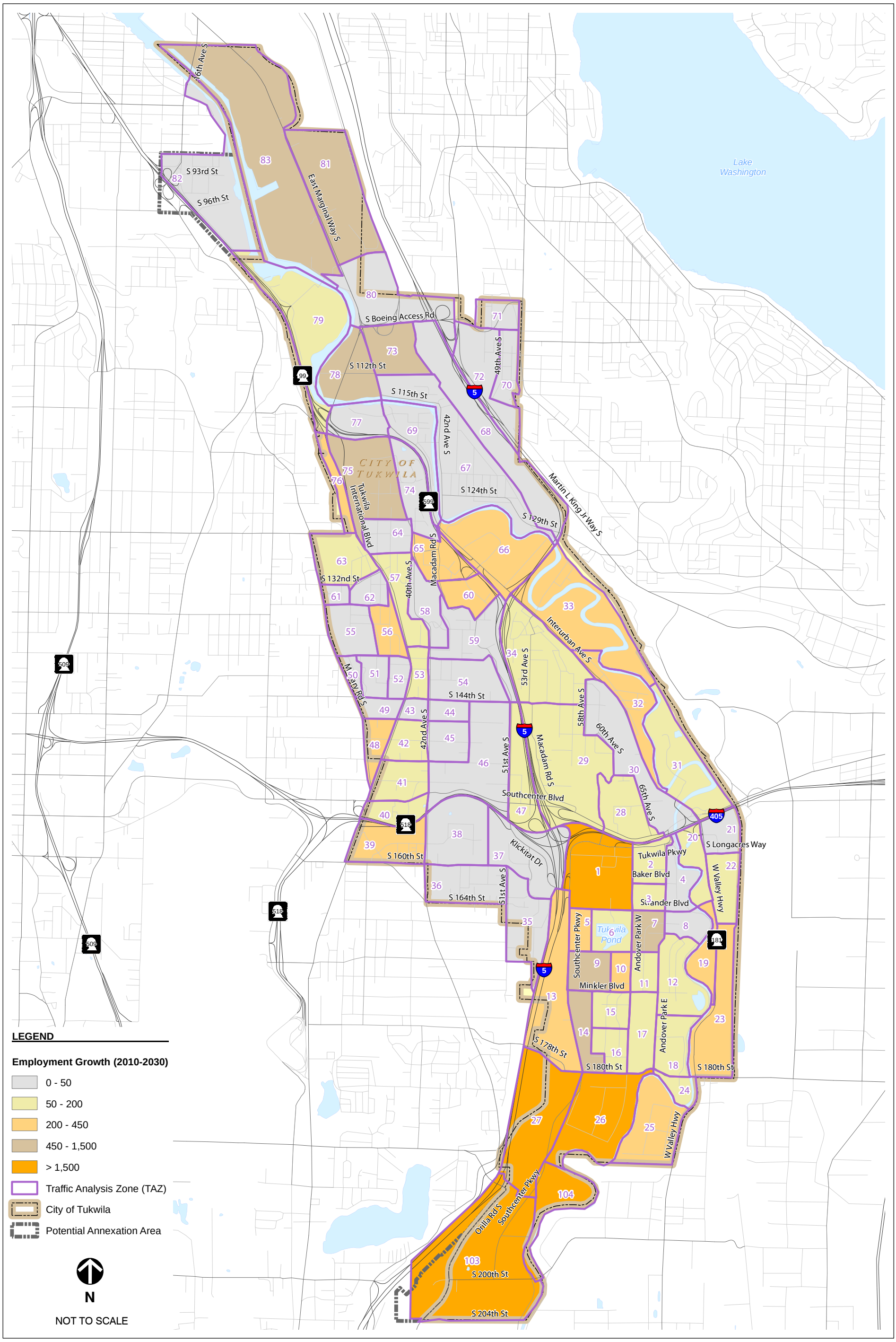
Growth in the areas outside of city limits are based on the data from the PSRC 2030 land use forecasts.



FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig24_hhGrowth.mxd

CITY OF TUKWILA -
2010 - 2030 HOUSEHOLD GROWTH
FIGURE 24



FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig25_empGrowth2.mxd

CITY OF TUKWILA -
2010 - 2030 EMPLOYMENT GROWTH
FIGURE 25

TRANSPORTATION NETWORK ASSUMPTIONS

Based on information from the Tukwila Public Works department, the following roadway projects were included in the 2030 transportation network.

- The extension of Strander Boulevard from W Valley Highway to Oakesdale Avenue in Renton
- Signalization of the S 144th Street / 42nd Avenue S intersection
- Signalization of the 133rd S Street / SR 599 Ramp intersection
- Reconfiguration of the Klickitat Drive / Southcenter Parkway intersection and realignment of Southcenter Parkway from the I-5 northbound off-ramp to Strander Boulevard
- Widening of Southcenter Parkway from S 180th Street to S 200th Street
- Restriping of Baker Boulevard to include a three-lane cross-section with bicycle lanes

In addition to roadway improvements, the 2030 model incorporates significant changes to transit both in Tukwila and in the region as a whole. Under 2030 conditions, it is assumed that Link Light Rail will extend from the University District in Seattle to S 200th Street in SeaTac.

2030 MODEL REVIEW

In the existing conditions section, the Tukwila travel model's performance was evaluated and validated by comparing traffic counts to the travel model's estimate of traffic flow across screenlines. These same screenlines were also used to evaluate the performance of the 2030 model by verifying whether the level of growth in traffic across the screenlines is consistent with growth in land use and historical growth in traffic.

As shown in **Table 16** and **Table 17**, growth in traffic across the screenlines is fairly modest despite a substantial amount of new development in Tukwila South and moderate development in the Southcenter area. Most of the growth in traffic is focused on the Southcenter Area, including north/south corridors of Southcenter Parkway, Andover Park East and Andover Park West, which reflects the development pattern described above. Historic trends have shown low levels of traffic growth over the last ten years despite significant expansions of retail development in the Southcenter area. However, the Tukwila South development is an order of magnitude larger than other recent developments in Tukwila. Therefore, the traffic growth projected in the Southcenter area would mostly contributed by the Tukwila South development. **Figures 26** and **27** shows the screenline map and **Figure 28** shows the location of the study intersections.

TABLE 16 – PM PEAK HOUR TRAFFIC GROWTH AT SOUTHCENTER SCREENLINES

Screenline ID	Screenline Location	2010 Traffic Counts		2030 Model Volumes		Percent Total Growth		Percent Annual Growth	
		NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
1	East-West, North of Strander Boulevard	3,771	3,871	5,082	5,515	34.7%	42.4%	1.5%	1.8%
2	East-West, North of Minkler Boulevard	3,492	3,550	4,398	4,075	25.9%	14.8%	1.2%	0.7%
3	East-West, North of S 180th Street	2,743	3,244	3,639	4,027	32.7%	24.1%	1.4%	1.1%
4	North-South, West of Andover Park W	3,001	3,257	3,411	4,043	13.7%	24.1%	0.6%	1.1%
5	North-South, West of Andover Park E	2,768	2,924	3,018	3,556	9.0%	21.6%	0.4%	1.0%
6	North-South, West of W Valley Highway	2,700	2,251	3,139	2,921	16.2%	30.0%	0.8%	1.3%
Total		18,475	19,097	22,686	24,138	22.8%	26.4%	1.0%	1.2%
		IN	OUT	IN	OUT	IN	OUT	IN	OUT
7	Southcenter Mall Cordon[1]	2,573	2,089	2,820	2,480	9.6%	18.2%	0.5%	0.9%

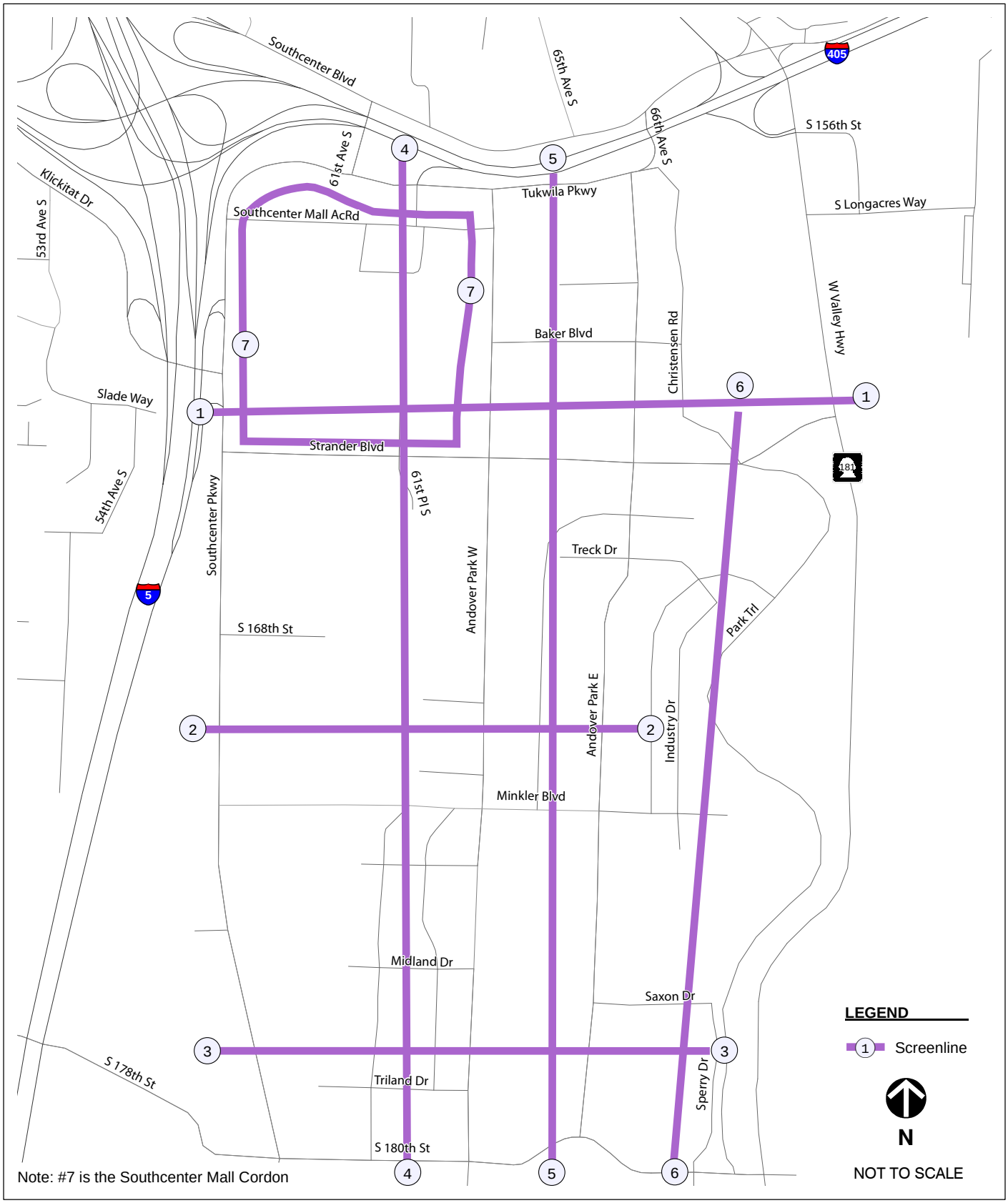
[1] See the definition of a cordon on page

Source: City of Tukwila travel model and counts, Fehr & Peers 2011.

TABLE 17 – PM PEAK HOUR TRAFFIC GROWTH PROJECTED AT CITYWIDE SCREENLINES

Screenline ID	Screenline Location	2010 Traffic Counts		2030 Model Volumes		Percent Total Growth		Percent Annual Growth	
		NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB	NB/EB	SB/WB
8	North-South, East of Southcenter	9,777	8,621	11,156	10,082	12.4%	14.5%	0.7%	0.8%
9	North-South, West of SR-99	1,520	1,323	1,564	1,377	2.8%	3.9%	0.1%	0.2%
10	East-West, North End of City	7,437	11,895	8,413	13,086	11.6%	9.1%	0.6%	0.5%
11	East-West, North of SR-599 / I-5 Junction	8,858	12,661	9,982	14,200	11.3%	10.8%	0.6%	0.6%
12	North-South, West of I-5	4,708	4,333	4,963	5,175	5.1%	16.3%	0.3%	0.9%
Total		32,300	38,833	36,078	43,920	10.5%	11.6%	0.6%	0.6%

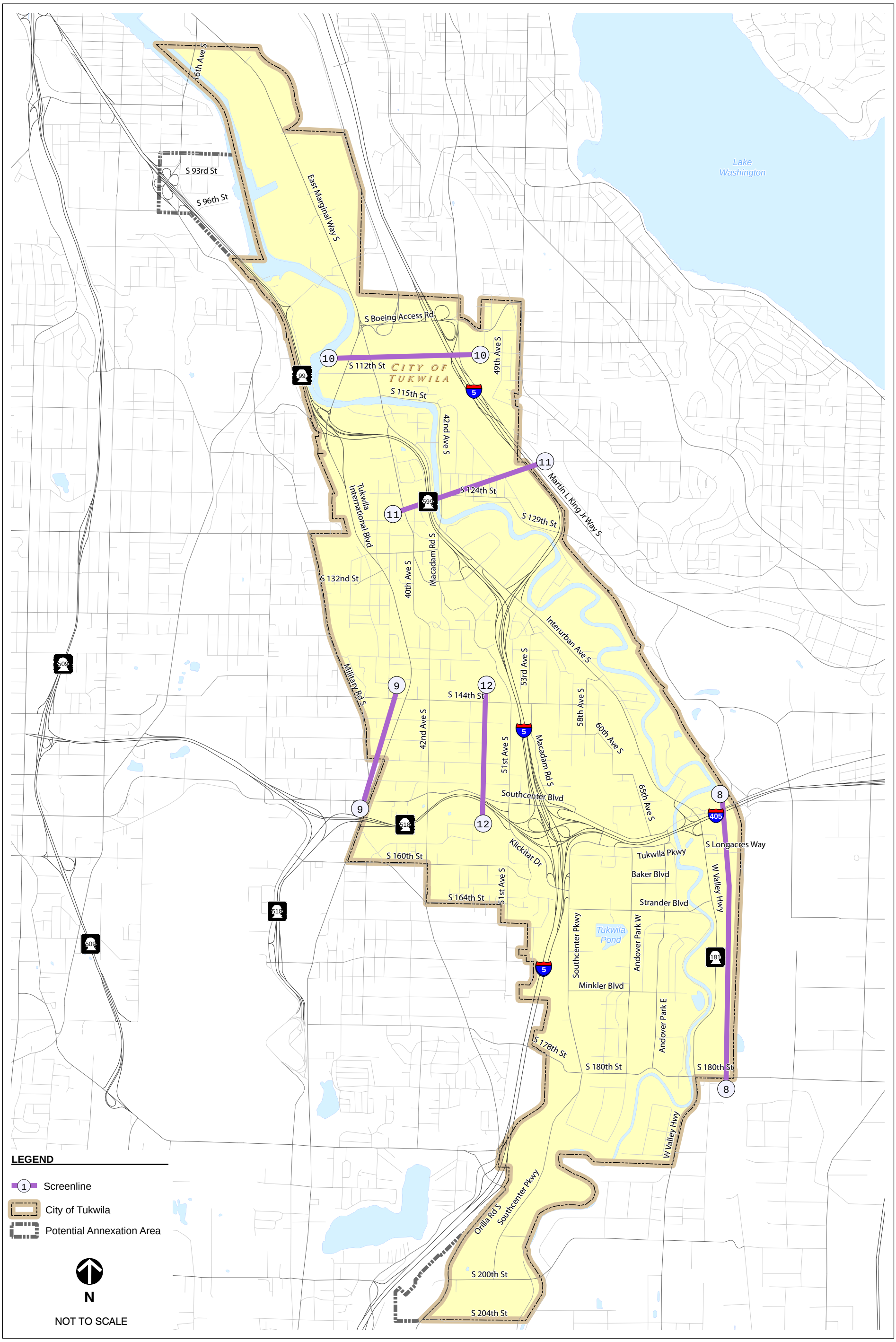
Source: City of Tukwila travel model and counts, Fehr & Peers 2011.



FEHR PEERS

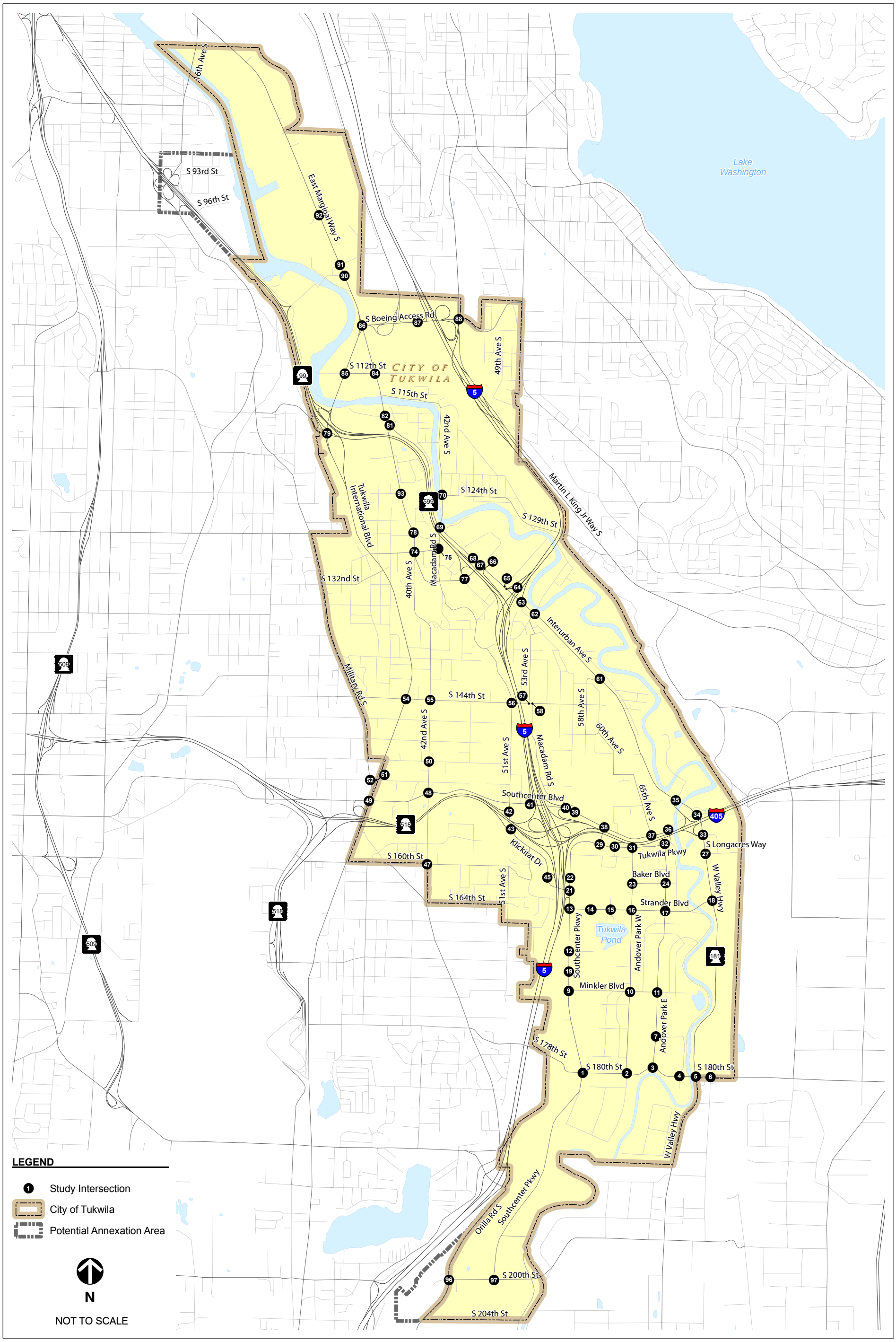
\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\fig04_screenline.mxd

CITY OF TUKWILA -
SCREENLINE MAP FOR SOUTHCENTER AREA
FIGURE 26



FEHR PEERS

CITY OF TUKWILA -
SCREENLINE MAP FOR AREAS OUTSIDE SOUTHCENTER AREA
FIGURE 27



FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig28_studyInts.mxd

CITY OF TUKWILA -
STUDY INTERSECTIONS FOR 2030 CONDITIONS
FIGURE 28

This page intentionally left blank.

CHAPTER 4. 2030 INTERSECTION LEVELS OF SERVICE

The intersection levels of service (LOS) for 2030 were calculated with the same method used to obtain existing LOS using Synchro and SimTraffic. Volumes were generated by the 2030 Tukwila travel demand model. To reduce model error, a technique known as the "difference method" was used to develop the 2030 traffic forecasts. The difference method adds the travel model's estimated growth in traffic between 2010 and 2030 conditions to the 2010 traffic counts taken at each location. This technique eliminates much of the model error by using existing traffic counts as the basis of the forecast rather than direct model output.

The analysis assumed that all signal timings for intersections in Tukwila would be optimized during the next 20 years; however, cycle lengths were not adjusted. Synchro was used to optimize the signal timings.

The 2030 intersection LOS was computed for AM and PM peak hour conditions across the entire City. Midday and Saturday peak periods were analyzed only for signalized intersections in the Southcenter area. LOS results are shown in **Figures 29, 30, and 31**. Summaries of intersection LOS can be found in **Tables 18 and 19**. The following section contains a more detailed discussion of each intersection operating at LOS F for any of the peak periods.

Corridor LOS was also calculated for designated corridors in the Southcenter area. These results are shown in **Figure 32.**

TABLE 18 – 2030 AM AND PM PEAK INTERSECTION LEVEL OF SERVICE

ID	Location	AM Peak		PM Peak	
		Delay (seconds)	LOS	Delay (seconds)	LOS
Signalized					
1	S. 180th Street / Southcenter Parkway	21.4	C	131.5	F
2	S. 180th Street / Andover Park W	33.6	C	94.7	F
3	S. 180th Street / Andover Park E	8.8	A	30.4	C
4	S. 180th Street / Sperry Drive	11.0	B	26.9	C
5	S. 180th Street / West Valley Highway	48.6	D	>150	F
6	S. 180th Street / 72nd Avenue S.	6.4	A	15.6	B
7	Saxon Drive / Andover Park E	6.6	A	9.6	A
9	Minkler Boulevard / Southcenter Parkway	3.1	A	17.3	B
10	Minkler Boulevard / Andover Park W.	13.1	B	30.7	C
11	Minkler Boulevard / Andover Park E.	10.6	B	17.0	B
12	S. 168th Street / Southcenter Parkway	14.6	B	26.3	C
13	Strander Boulevard / Southcenter Parkway	17.9	B	46.3	D
14	Strander Boulevard / Southcenter Mall SW Driveway	3.1	A	22.4	C
15	Strander Boulevard / 61st Place S.	22.6	C	25.9	C
16	Strander Boulevard / Andover Park W.	29.2	C	54.9	D
17	Strander Boulevard / Andover Park E	30.0	C	40.5	D
18	Strander Boulevard / W Valley Highway	46.1	D	>150	F

TABLE 18 – 2030 AM AND PM PEAK INTERSECTION LEVEL OF SERVICE

ID	Location	AM Peak		PM Peak	
		Delay (seconds)	LOS	Delay (seconds)	LOS
19	Wig Boulevard / Southcenter Parkway	3.7	A	11.5	B
21	Klickitat Drive / Southcenter Parkway	16.2	B	28.9	C
22	I-5 Exit 153 Off-ramp / Southcenter Parkway	14.2	B	61.5	E
23	Baker Boulevard / Andover Park W	5.0	A	15.1	B
24	Baker Boulevard / Andover Park E	5.6	A	11.7	B
27	Longacres Way / W Valley Highway	10.8	B	18.8	B
29	Tukwila Parkway / 61st Avenue S	18.9	B	35.3	D
30	Tukwila Parkway / I-405 NB On-ramp	5.6	A	16.4	B
31	Tukwila Parkway / Andover Park W	11.7	B	17.6	B
32	Tukwila Parkway / Andover Park E	23.6	C	23.9	C
33	I-405 NB Ramps / W Valley Highway	59.9	E	48.2	D
34	Southcenter Boulevard / W Valley Highway	42.3	D	111.6	F
35	I-405 SB Ramps/Fort Dent Way / Interurban Avenue S	38.9	D	57.0	E
36	Southcenter Boulevard / 66th Avenue S	18.3	B	120.9	F
38	Southcenter Boulevard / 61st Avenue S	18.5	B	71.1	E
39	Southcenter Boulevard / Macadam Rd. S	7.4	A	11.8	B
41	Southcenter Boulevard / I-5 SB Off-ramp	16.3	B	29.5	C
48	Southcenter Boulevard / 42nd Avenue S	16.9	B	29.0	C
49	Southcenter Boulevard / Tukwila International Boulevard	23.9	C	58.9	E
50	S 150th Street / 42nd Avenue S	7.0	A	6.4	A
51	S 152nd Street / Tukwila International Boulevard	17.1	B	29.1	C
54	S 144th Street / Tukwila International Boulevard	18.5	B	35.5	D
55	S 144th Street / 42nd Avenue S	7.1	A	11.4	B
61	58th Avenue S / Tukwila International Boulevard	8.9	A	8.9	A
62	52nd Avenue S / Interurban Avenue S	10.1	B	12.3	B
64	I-5 SB Off-ramp / Interurban Avenue S	17.7	B	32.9	C
65	48th Avenue S / Interurban Avenue S	11.7	B	13.7	B
66	SR-599 Off-ramp / Interurban Avenue S	23.1	C	21.2	C
67	Gateway Drive / Interurban Avenue S	26.3	C	29.5	C
68	SR-599 NB On-ramp / Interurban Avenue S	7.9	A	23.7	C
69	42nd Avenue S / Interurban Avenue S	35.4	D	36.7	D
77	S 133rd Street / SR 599 Ramps	8.2	A	7.8	A
79	S 116th Way / Tukwila International Boulevard	24.5	C	38.4	D
81	E Marginal Way / Interurban Avenue S	28.3	C	27.4	C
85	S 112th Street / Tukwila International Boulevard	12.1	B	37.1	D
86	Boeing Access Road / E Marginal Way	26.8	C	63.4	E

TABLE 18 – 2030 AM AND PM PEAK INTERSECTION LEVEL OF SERVICE

ID	Location	AM Peak		PM Peak	
		Delay (seconds)	LOS	Delay (seconds)	LOS
87	Boeing Access Road / I-5 SB Off-ramp	32.5	C	20.7	C
88	Boeing Access Road / Martin Luther King Way	40.0	D	61.4	E
90	S 102nd Street / E Marginal Way	2.9	A	5.6	A
91	S Norfolk Street / E Marginal Way	5.8	A	6.7	A
92	S 96th Pl. / E Marginal Way	4.5	A	12.8	B
93	S 124th Street / E Marginal Way	6.3	A	18.2	B
96	S 200th Street / Orillia Road S	22.0	C	18.1	B
97	S 200th Street / Southcenter Parkway	61.7	E	48.9	D
Unsignalized					
37	Southcenter Boulevard / 65th Ave S	12.0	B	17.5	C
40	Southcenter Boulevard / I-405 SB Off-ramp	22.7	C	>150	F
42	SR 518 WB On-ramp / Klickitat Drive	7.1	A	11.3	B
43	SR 518 EB Off-ramp / Klickitat Drive	13.7	B	26.2	D
45	I-5 SB On-ramp / Klickitat Drive	8.2	A	17.5	C
47	S 160th Street / 42nd Avenue S	11.1	B	24.3	C
52	Military Road S / 152nd Street S	7.9	A	10.0	A
56	S 144th Street / Macadam Road S / 51st Ave S	8.6	A	17.6	C
57	S 144th Street / 53rd Avenue S	10.2	B	19.9	C
58	S 144th Street / Macadam Road S	10.5	B	16.3	C
63	I-5 NB On-ramp / Interurban Avenue S	12.8	B	13.5	B
70	S 124th Street / 42nd Avenue S	12.7	B	26.1	D
74	S 130th Street / E Marginal Way	16.0	C	29.3	D
75	S 130th Street / Macadam Rd S	9.8	A	11.2	B
78	128th Street S / E Marginal Way	14.9	B	12.4	B
82	S 116th Street / E Marginal Way	27.8	D	36.6	E
84	S 112th Street / E Marginal Way	21.1	C	29.8	D

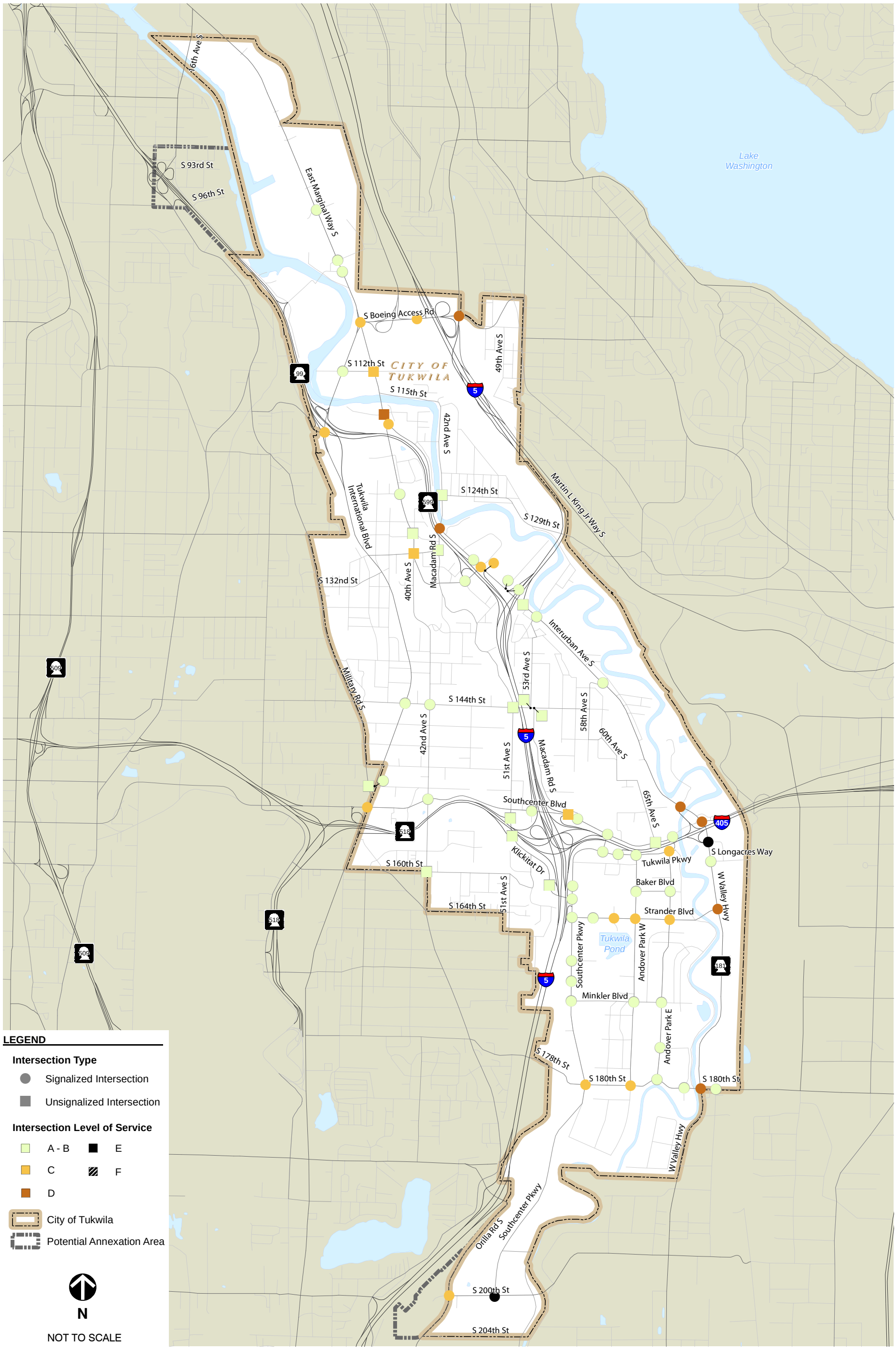
Fehr & Peers, 2010.

Table 18 provided level of service for 2030 weekday AM and PM peak hours. Due to the density of retail and commercial land uses in the Southcenter area, 2030 Midday and Saturday peak hour analysis was also calculated for signalized intersections in this area. Results from this analysis are provided as Table 19.

TABLE 19 – 2030 MIDDAY AND SATURDAY INTERSECTION LEVEL OF SERVICE

ID	Location	Mid-day		Saturday	
		Delay (seconds)	LOS	Delay (seconds)	LOS
Signalized					
1	S 180th Street / Southcenter Parkway	103.8	F	144.5	F
9	Minkler Boulevard / Southcenter Parkway	62.0	E	110.5	F
12	S 168th Street / Southcenter Parkway	13.8	B	6.1	A
13	Strander Boulevard / Southcenter Parkway	28.7	C	72.1	E
14	Strander Boulevard / Southcenter Mall SW Driveway	11.3	B	39.2	D
15	Strander Boulevard / 61st Place S	25.0	C	34.9	C
16	Strander Boulevard / Andover Park W	49.5	D	76.9	E
19	Wig Boulevard / Southcenter Parkway	14.8	B	7.0	A
21	Klickitat Drive / Southcenter Parkway	24.8	C	61.1	E
22	I-5 Exit 153 Off-ramp / Southcenter Parkway	23.6	C	122.8	F
23	Baker Boulevard / Andover Park W	21.0	C	26.0	C
29	Tukwila Parkway / 61st Avenue S	37.5	D	53.6	D
30	Tukwila Parkway / I-405 NB On-ramp	15.8	B	47.0	D
31	Tukwila Parkway / Andover Park W	16.3	B	23.1	C
38	Southcenter Boulevard / 61st Avenue S	57.5	E	>150	F

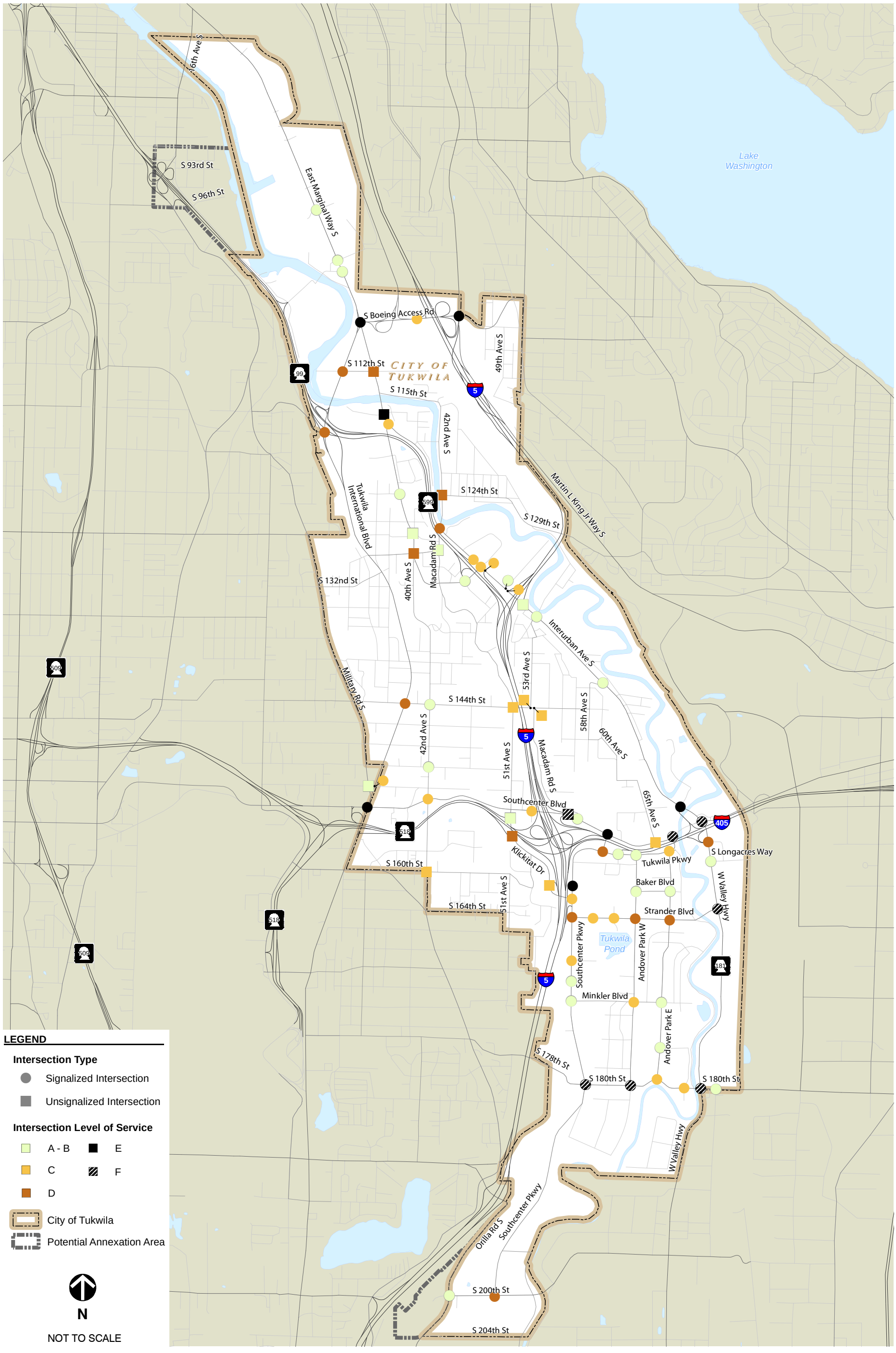
Fehr & Peers, 2010.



FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig29_studyInts_AM_LOS_2030.mxd

CITY OF TUKWILA -
2030 AM PEAK HOUR INTERSECTION LEVEL OF SERVICE
FIGURE 29



FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig30_studyInts_PM_LOS_2030.mxd

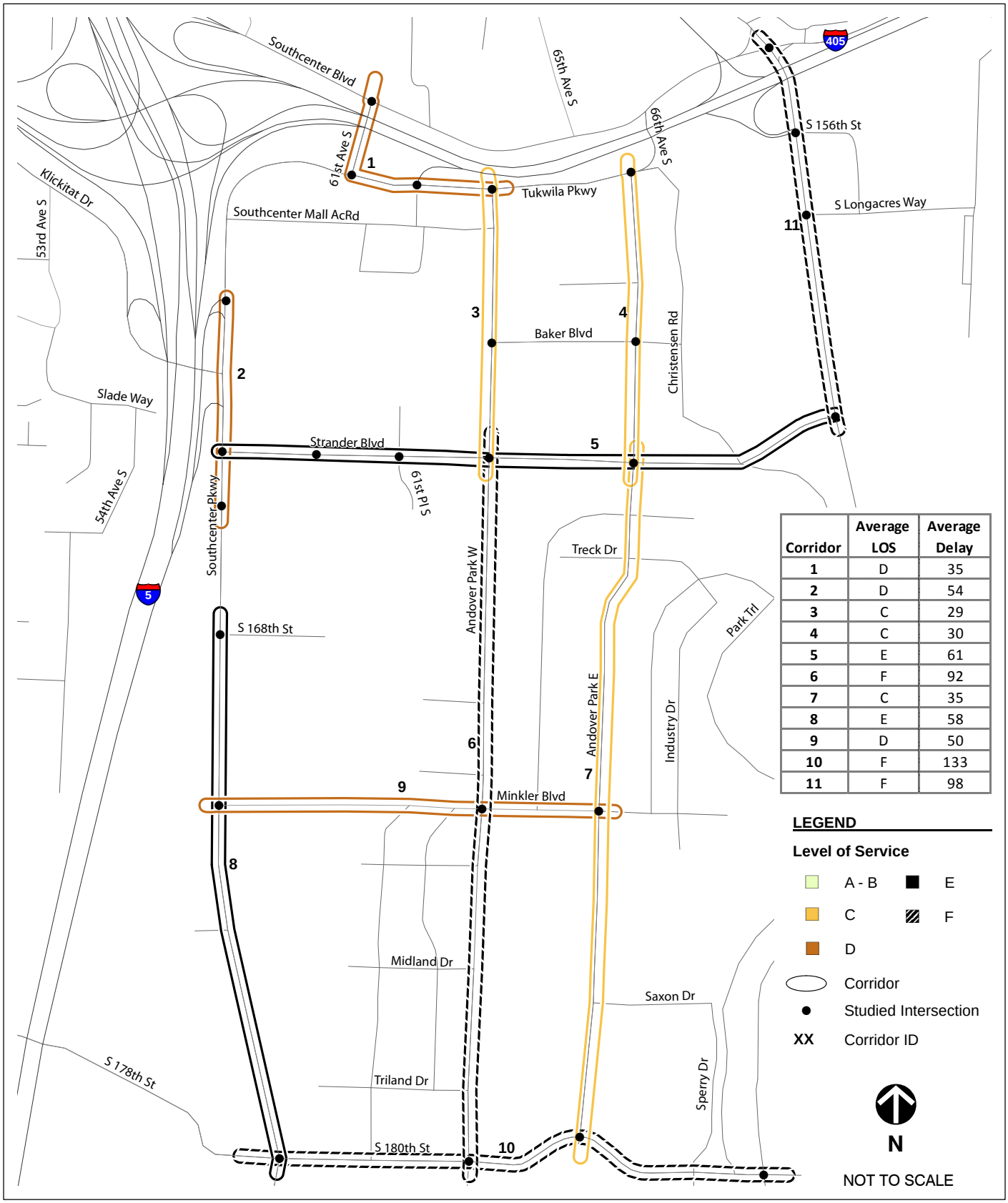
CITY OF TUKWILA -
2030 PM PEAK HOUR INTERSECTION LEVEL OF SERVICE
FIGURE 30

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig31_los_zone1_MID_SAT_2030.mxd

CITY OF TUKWILA -
2030 MIDDAY AND SATURDAY
INTERSECTION LEVEL OF SERVICE
FOR SOUTHCENTER AREA

FIGURE 31



Corridor	Average LOS	Average Delay
1	D	35
2	D	54
3	C	29
4	C	30
5	E	61
6	F	92
7	C	35
8	E	58
9	D	50
10	F	133
11	F	98

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig32_LOS_Corridors_2030.mxd

CITY OF TUKWILA - 2030 SOUTHCENTER CORRIDOR LEVEL OF SERVICE

FIGURE 32

CONGESTED INTERSECTIONS

The following intersections are anticipated to operate at LOS E or F for one or more of the four peak periods analyzed.

Signalized Intersections

Intersection 1: S 180th Street & Southcenter Parkway

The signalized intersection of S 180th Street and Southcenter Parkway is expected to operate at LOS F for PM, midday, and Saturday peak periods in 2030. While this intersection performed well under existing conditions, the new employment and housing growth forecasted in Tukwila South is expected to substantially increase the demand through the intersection. The current split phase signal operation of the intersection is not conducive to the anticipated high volume.

Intersection 2: S 180th Street & Andover Park West

The signalized intersection of S 180th Street and Andover Park West is expected to operate at LOS F during the PM peak hour. With the anticipated growth in Tukwila South, a larger demand is expected to be placed on the S 180th Street corridor. New development is also expected along Andover Park West south of S 180th Street, increasing demand on the northbound approach to the intersection. These increases in demand are responsible for the poor LOS.

Intersection 5: S 180th Street & W Valley Highway

The signalized intersection of S 180th Street and W Valley Highway is expected to operate at LOS F during the PM peak hour. This intersection was estimated to operate at LOS F under existing conditions as well. With the anticipated growth in Tukwila South, an even greater demand is expected to be placed on this intersection.

Intersection 9: Minkler Boulevard & Southcenter Parkway

The signalized intersection of Minkler Boulevard and Southcenter Parkway is forecast to operate at LOS F during the Saturday peak hour in 2030. Increases in the demand of the northbound through, southbound through, and westbound left movements contribute to the poor LOS. The increase in demand at this intersection, along with the Southcenter Parkway corridor is due to the development along Southcenter Parkway south of S 180th Street.

Intersection 18: Strander Boulevard & W Valley Highway

The intersection of Strander Boulevard and W Valley Highway is expected to operate at LOS F during the PM peak hours in 2030. The inclusion of the Strander Boulevard extension from W Valley Highway to Oakesdale Avenue in the 2030 model leads to increased demand on this intersection, resulting in poor LOS.

Intersection 22: I-5 Exit Off-ramp & Southcenter Parkway

The signalized intersection of the I-5 northbound off-ramp and Southcenter Parkway is projected to operate at LOS F during the 2030 Saturday peak hour. Increased volumes on the north, south, and east approaches result in poor operations at this intersection.

Intersection 34: Southcenter Boulevard & W Valley Highway

The signalized intersection of Southcenter Boulevard and W Valley Highway would continue to operate at LOS F during the PM peak in 2030, as it does under existing conditions. With increases in demand at the intersection in all directions forecasted for 2030, operations are expected to remain at LOS F.

Intersection 36: Southcenter Boulevard & 68th Avenue S

The intersection of Southcenter Boulevard and 68th Avenue S is expected to operate at LOS F during the PM peak hour in 2030. An increase in volume on the northbound approach results in additional intersection delay. This increase in volume results from the forecasted growth in employment and housing in the Southcenter area.

Intersection 38: Southcenter Boulevard & 61st Avenue S

The intersection of Southcenter Boulevard and 61st Avenue S is forecast to operate at LOS E during the PM peak hour and LOS F during the Saturday peak hour in 2030. Due to the increase in employment and housing in the Southcenter area and Tukwila South, traffic demand at this intersection is expected to increase. The vehicle queues from the Tukwila Parkway and 61st Avenue S intersection would also contribute to the LOS F operations.

Unsignalized

Intersection 40: Southcenter Boulevard & I-405 SB Off-ramp

The intersection of Southcenter Boulevard and the I-405 SB off-ramp is expected to operate at LOS F during the PM peak hour in 2030. The poor LOS can be attributed to the northbound left turn movement. The forecasted growth in demand of the eastbound movements on Southcenter Boulevard cause more conflicts with the northbound left movement resulting in increased delay.

PEDESTRIAN AND BICYCLE CONDITIONS

Section 1 of this report identified a number of pedestrian and bicycle facilities throughout the City that operated poorly under existing conditions. In some cases, the poor operations were caused by rough pavement or other issues that could be addressed through routine maintenance. However, in other cases, the poor operations were caused by the lack of an adequate facility for bicycles or pedestrians. Since pedestrian and bicycle LOS is dictated by the physical space available to pedestrians or bicycles (as opposed to estimated flows), the findings in the *Existing Conditions Analysis* are similar to what would be determined under 2030 conditions (assuming no improvements were made).

CHAPTER 5. 2030 RECOMMENDED IMPROVEMENTS

Chapter 2 identified existing deficiencies in the bicycle, pedestrian, and roadway network. Chapter 4 identified additional deficiencies projected under 2030 conditions. This section describes recommended roadway improvements that have been developed to address or lessen the degree of existing or future deficiencies on the bicycle, pedestrian, and roadway networks.

When developing the recommended improvement projects for this chapter, City of Tukwila staff and its consultant focused on meeting the four main objectives outlined in the City's Comprehensive Plan:

- Improve and sustain residential neighborhood quality and livability
- Redevelop and reinvigorate the Tukwila International Boulevard Corridor
- Redevelop and Reinvigorate the industrial areas along East Marginal Way
- Support a thriving Urban Center as a true regional concentration of employment, housing, shopping and recreational opportunities

As a reflection of these goals, the improvement projects identified in this chapter include a mix of neighborhood-scale projects, major arterial upgrades, improved bicycle and pedestrian connections, and substantial investments in the Southcenter Urban Center. It should be noted that the improvements presented in this chapter are not intended to be a comprehensive list of all transportation projects that may be needed over the next 20 years. Rather, this report focuses on arterials and collector streets. The City of Tukwila has other programs that focus on smaller-scale neighborhood improvements and frontage improvements associated with commercial and industrial redevelopment.

To ensure consistency with existing plans, the projects in the 2012-2017 Transportation Improvement Program (TIP) were also reviewed. As described in this chapter, some of the TIP projects were consistent with, or complementary to, the recommendations identified as part of this technical process to update the Transportation Element and were included in the recommended project list shown below. However, some projects in the TIP are not recommended since they do not address deficiencies found as part of this analysis. The TIP projects recommended for removal are identified at the end of this chapter.

Recommended projects are organized according to the Tukwila Transportation Impact Fee Zone (TIF) in which they are located, and are organized as such in the following sections. The projects are organized from south to north, and east to west within the each TIF Zone, and are assigned a priority of A, B, or C. Priority A projects are the highest priority, and priority C are those not recommended at this time before 2030. The number system combines these three elements in the format of 1.1.C. The first digit is the TIF Zone, the second is the geographic project number, and the final letter designates the priority.

Project prioritization was assigned based on segments or intersections with poor LOS where feasible improvements were identified. Additionally the projects strive to be reasonably balanced between modes and prioritize projects in the existing TIP and grant feasible projects.

Cost Estimates

To complement the list of recommended improvements, cost estimates are also provided. As with all planning-level cost estimates, these are preliminary and are expected to change based on specific alignments and details that can only be determined during final design. Tables at the beginning of each section provide a summary of the improvement measures' estimated costs. Figures show the project locations within each TIF zone.

Following the cost estimate table, each recommended project is described in detail to assist in future planning and the development of upcoming Transportation Improvement Program project lists. Additionally, recommended projects from the 2009 Walk and Roll Plan are included. This plan is based on policies outlined in the City's Comprehensive Plan and the concept of "complete streets," which provides

mobility for all users and all modes. Walk and Roll improvements focus on bicycle and pedestrian projects.

The recommended projects (A-B projects, including TIP and Walk and Roll projects) identified in the previous chapter have estimated costs of $91,690,000 in TIF Zone1, $13,322,000 in TIF Zone 2, $36,552,000 in TIF Zone 3, and $36,666,000 in TIF Zone 4. The total cost of all recommended projects is estimated at $178,230,000.

Appendix E presents the summary cost sheets for projects as estimated by Fehr & Peers. Costs for TIP and Walk and Roll projects were taken from their respective documents. Note that estimates for TIP and Walk and roll projects are planning level estimates and do not have the same level of supporting cost estimation documents as the projects recommendations fully detailed in this report.

Projected Revenue Forecasts

Estimated transportation revenue forecasts for 2011-2030 for Tukwila were developed. Full revenue forecast details are included as **Appendix D** in this document. Revenue forecasts are broken into two main components: 1) existing revenue and 2) potential additional revenue sources. Existing revenue sources for transportation capital improvements (including grants, sales tax, real estate excise tax, and other sources), estimates of revenue over the 2011-2030 time period range from a low of $71,042,000 to a high of $104,493,000. In terms of potential additional revenue sources, three sources were identified. These sources are 1) implementing a transportation benefit district, 2) voted general obligation bonds, and 3) councilmanic bonds. Estimates of revenue over the 2011-2030 time period for these additional sources range from a low of $85,927,000 to a high of $187,187,000. The combined total estimated revenue for capital from existing and potential sources ranges from $156,969,000 to $291,680,000. The average of this range is $224,325,000.

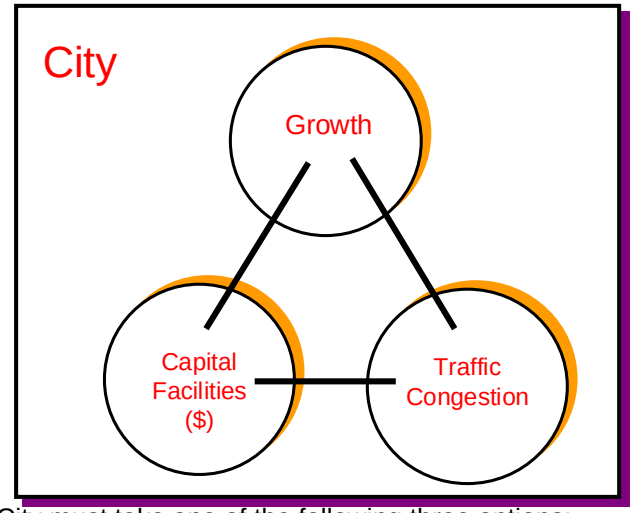
Based on total estimated project costs, the City will not have adequate capital revenue under existing sources to support all recommended projects. However, utilizing other potential sources of revenue could potentially generate sufficient capital to finance the recommendations.

Given that there is uncertainty regarding future revenue and whether the City Council will adopt any of the potential additional revenue sources, the recommended project list was further refined to match the existing revenue forecasts. This list of projects and costs is provided in **Table 20** below. Additional projects which were considered but not recommended are provided in **Appendix F**.

Options for Concurrency

The 1990 Growth Management Act (GMA) requires each local jurisdiction to identify facility and service needs based on level of service standards for transportation facilities and services. Level of service standards are used to judge the performance of the transportation system. The GMA further requires that a transportation element include specific actions and requirements for bringing into compliance any facilities or services that are below an established level of service standard. It also requires that system expansion needs must be identified for at least ten years, based on the traffic forecasts for the adopted land use plan and level of service standards. For the needs, a financing plan must be developed. If probable funding falls short of meeting identified needs, the jurisdiction is given two options: 1) to raise additional funding, and/or 2) to reassess the land use assumptions. Under the GMA it is also possible to lower the LOS standards. The relationship between LOS standards, funding needs to accommodate increased travel, and land use assumptions is referred to as “concurrency”.

The concept of concurrency can be illustrated with a three-legged stool. Each leg is characterized as follows:



Leg 1- Growth

Leg 2- Traffic congestion (measured with the level of service standards)

Leg 3- Resources needed to fund new capital facilities

The stool must be balanced. If it is standing upright, then growth is occurring concurrent with needed facilities. If the three-legged stool is slanted or tipped, then actions must be taken to keep growth balanced correctly with available funding and standards. To stabilize the stool, the City must take one of the following three options:

1. Reduce growth by denying or delaying land use permit applications
2. Increase funding for new facilities
3. Change the level of service standard

LOS Methodology Options for Roads

The GMA allows each local jurisdiction to choose a LOS method and standards. The text box on the right shows the different LOS methodology options. Generally, one can define a method by selecting an option from each section of the table. For example, the LOS could be measured in terms of delay for averaged PM peak two hours and applied to signalized intersections to calculate level of service.

Tukwila currently measures LOS in Southcenter by averaging LOS along corridors. Outside of Southcenter, LOS is based on individual intersection performance.

LOS Methodology Options

LOS Measuring Method
-Volume to capacity ratio
-Delay
-Average travel time/travel speed
LOS Measuring Period
-PM peak one hour
-AM peak one hour
-Noon peak one hour
-Weekend peak one hour
-Averaged PM peak two hours
-Averaged PM peak three hours
LOS Applied Location
-Signalized intersections
-Arterial intersections (including unsignalized intersections)
-Corridor average
-Area average of intersections
-Screenlines
-Arterial segments

TABLE 20 – RECOMMENDED TRANSPORTATION IMPROVEMENTS BY PRIORITY (COSTS IN THOUSANDS)

		Priority A (Pre 2030)				Priority B (Pre 2030)				Priority C (Post 2030)				
#	Project Description	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Total
TIF Zone 1 Projects														
1.1.C	South of S 180th Street from Southcenter Parkway to West Valley Highway: New Roadway Construction									$33,316				**$33,316**
1.2.A	S 180th Street and Southcenter Parkway: Intersection Improvement	$2,057												**$2,057**
1.3.A	S 180th Street and Andover Park W: Intersection Improvement	$179												**$179**
1.4.A	S 180th Street from Sperry Drive S to Green River Bridge: Sidewalk Improvement			$125										**$125**
1.5.A	Andover Park E or Andover Park W from Minkler Boulevard to S 180th Street: Bicycle Facility Improvement		$69											**$69**
1.6.A	Minkler Boulevard and Andover Park W: Intersection Improvement	$1,551												**$1,551**
1.7.B	Minkler Boulevard from Andover Park W to W Valley Highway: Roadway Extension					$38,440								**$38,440**
1.8.A	Andover Park E from Minkler Boulevard to Strander Boulevard: Bicycle Facility Improvement		$69											**$69**
1.9.C	W Valley Highway from Strander Boulevard to S 180th Street: Sidewalk Improvement											No Cost		**No Cost**

TABLE 20 – RECOMMENDED TRANSPORTATION IMPROVEMENTS BY PRIORITY (COSTS IN THOUSANDS)

		Priority A (Pre 2030)				Priority B (Pre 2030)				Priority C (Post 2030)				
#	Project Description	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Total
1.10.A	S 168th (Pond) Street from Southcenter Boulevard to Andover Park E: New Street Construction	$17,425												**$17,425**
1.11.A	Treck Drive from Andover Park W to Andover Park E: New Street Construction	$1,930												**$1,930**
1.12.A	Green River and Interurban Trails from West Valley Highway: Bicycle Facility Improvement and Signage		$173											**$173**
1.13.B	Strander Boulevard and W Valley Highway: Intersection Improvement	$2,490												**$2,490**
1.14.A	Baker Boulevard and Andover Park W: Tukwila Urban Center, Transit Center				$5,475									**$5,475**
1.15.B	Baker Boulevard from Andover Park W to W Valley Highway: Pedestrian and Bicycle Facility Improvement						$4,380	$4,380						**$8,760**
1.16.C	I-5 Northbound Off-Ramp and Southcenter Parkway: Intersection Improvement									$1,071				**$1,071**
1.17.A	Andover Park W from Strander Boulevard to Tukwila Parkway: Roadway Widening and Center Turn Lane Construction		$1,461											**$1,461**
1.18.A	Andover Park E from Strander Boulevard to Tukwila Parkway: Bicycle Facility Improvement		$470											**$470**
1.19.B	Tukwila Parkway and 61st Avenue S: Intersection Improvement					$185								**$185**

TABLE 20 – RECOMMENDED TRANSPORTATION IMPROVEMENTS BY PRIORITY (COSTS IN THOUSANDS)

		Priority A (Pre 2030)				Priority B (Pre 2030)				Priority C (Post 2030)				
#	Project Description	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Total
1.20.C	Tukwila Parkway from 61st Avenue S to 66th Avenue S: Bicycle Facility Improvement											$1,531		**$1,531**
1.21.C	Tukwila Parkway from 66th Avenue S to W Valley Highway: Roadway Extension									TBD				**TBD**
1.22.C	Southcenter Boulevard and I-405 Southbound Off-Ramp: Intersection Improvement									TBD				**TBD**
1.23.B	Southcenter Boulevard from 53rd Avenue S to 66th Avenue S: Bicycle Facility Improvement						$10,132							**$10,132**
1.24.A	Southcenter Boulevard from 61st Avenue S to 65th Avenue S: Sidewalk and Crosswalk Improvement			$64										**$64**
1.25.B	Southcenter Boulevard and 65th Avenue S: Crosswalk Improvement							$337						**$337**
1.26.A	Southcenter Boulevard and 66th Avenue S: Intersection Improvement	$50												**$50**
1.27.B	Southcenter Boulevard and W Valley Highway: Intersection Improvement							$248						**$248**
	TIF Area 1 Subtotal	**$25,682**	**$2,242**	**$189**	**$5,475**	**$38,625**	**$14,512**	**$4,965**	**$0**	**$34,387**	**$0**	**$1,531**	**$0**	**$127,608**

TABLE 20 – RECOMMENDED TRANSPORTATION IMPROVEMENTS BY PRIORITY (COSTS IN THOUSANDS)

		Priority A (Pre 2030)				Priority B (Pre 2030)				Priority C (Post 2030)				
#	Project Description	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Total
TIF Zone 2 Projects														
2.1.C	Macadam Road S from S 150th Street to Southcenter Boulevard: Pedestrian and Bicycle Facility Improvement										$1,936	$1,935		**$3871**
2.2.A	Interurban Avenue S from Fort Dent Way to S 143rd Street: Roadway Reconstruction	$6,660		$4,440										**$11,100**
2.3.B	Macadam Road S from S 150th Street to S 144th Street: Sidewalk Improvement							$405						**$405**
2.4.A	Macadam Road S and S 144th Street: Intersection Improvement	$627												**$627**
2.5.A	53rd Ave S from S 144th Street to S 130th Place: Roadway Widening and Bicycle Facility Improvement		$1,190											**$1,190**
	TIF Zone 2 Subtotal	**$7,287**	**$1,190**	**$4,440**	**$0**	**$0**	**$0**	**$405**	**$0**	**$0**	**$1,936**	**$1,935**	**$0**	**$17,193**
TIF Zone 3 Projects														
3.1.B	S 160th Street and 53rd Avenue S from 42nd Avenue S to Klickitat Drive: Bicycle Facility Improvement						$2,654							**$2,654**
3.2.B	Klickitat Drive from 53rd Avenue S to Southcenter Parkway: Walkway Improvement						$843	$843						**$1,686**

TABLE 20 – RECOMMENDED TRANSPORTATION IMPROVEMENTS BY PRIORITY (COSTS IN THOUSANDS)

		Priority A (Pre 2030)				Priority B (Pre 2030)				Priority C (Post 2030)				
#	Project Description	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Total
3.3.A	42nd Avenue S from S 144th Street to S 160th Street: Bicycle Boulevard Addition		$161											**$161**
3.4.B	S 152nd Street from Tukwila International Boulevard to 42nd Avenue S: Sidewalk Improvement							$1,605						**$1,605**
3.5.A	S 150th Street from Tukwila International Boulevard to 42nd Avenue S: Sidewalk Improvement							$2,603						**$2,603**
3.6.B	S 148th Street from Tukwila International Boulevard to 46th Avenue S: Sidewalk Improvement							$3,117						**$3,117**
3.7.B	S 146th Street from Tukwila International Boulevard to 47th Avenue S: Sidewalk Improvement							$3,756						**$3,756**
3.8.B	51st Ave S from S 144th Street to Southcenter Parkway: Bicycle Facility Improvement						$1,823							**$1,823**
3.9.A	S 144th Street from 42nd Avenue S to Tukwila International Boulevard: Multimodal Improvements		$913	$912										**$1,825**
3.10.B	S 144th Street from 42nd Avenue S to 51st Avenue S: Sidewalk Improvement							$2,102						**$2,102**
3.11.B	S 144th Street from 42nd Ave S to Macadam Road S: Bicycle Facility Improvement						$26							**$26**

TABLE 20 – RECOMMENDED TRANSPORTATION IMPROVEMENTS BY PRIORITY (COSTS IN THOUSANDS)

		Priority A (Pre 2030)				Priority B (Pre 2030)				Priority C (Post 2030)				
#	Project Description	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Total
3.12.B	S 144th Street Bridge over I-5: Preliminary Engineering for Sidewalks							$100						**$100**
3.13.A	40th Avenue S and 42nd Avenue S from S 128th Street to S 144th Street: Pedestrian and Bicycle Facility Improvement		$678	$1,018										**$1,696**
3.14.B	S 142nd Street from Tukwila International Boulevard to 37th Avenue S: Sidewalk Improvement							$1,282						**$1,282**
3.15.B	S 141st Street from Tukwila International Boulevard to 42nd Avenue S: Sidewalk Improvement							$93						**$93**
3.16.B	S 140th Street from Tukwila International Boulevard to 46th Avenue S: Sidewalk Improvement							$3,952						**$3,952**
3.17.B	Macadam Road S from S 133rd Street to S 144th Street: Bicycle Facility Improvement						$134							**$134**
3.18.B	S 135th Street and 37th Avenue S from Military Road S to Tukwila International Boulevard: Bicycle Facility Improvement						$508							**$508**
3.19.A	E Marginal Way from S 130th Street to Macadam Road S: Bicycle Facility Improvement						$35							**$35**
3.20.A	S 133rd Street and SR 599 Ramps: Intersection Improvements	$190												**$190**

TABLE 20 – RECOMMENDED TRANSPORTATION IMPROVEMENTS BY PRIORITY (COSTS IN THOUSANDS)

		Priority A (Pre 2030)				Priority B (Pre 2030)				Priority C (Post 2030)				
#	Project Description	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Total
3.21.B	S 130th Street from Tukwila International Boulevard to Macadam Road S: Roadway Widening and Bicycle Facility Improvement						$4,244							**$4,244**
3.22.B	E Marginal Way/40th Avenue S and S 130th Street: Intersection Improvement	$163												**$163**
3.23.A	S 115th Street and 42nd Avenue S from E Marginal Way to S 133rd Street: Bicycle Facility Improvement		$45											**$45**
3.24.B	S 125th Street/50th Place S from 46th Avenue S to E City Limits: Bicycle Facility Improvement						$677							**$677**
3.25.B	Tukwila International Boulevard from S Boeing Access Road to13400 Block Signal: Pedestrian Improvement							$2,040						**$2,040**
3.26.A	E Marginal Way from S Boeing Access Road to Interurban Avenue S: Bicycle Facility Improvement		$35											**$35**
	TIF Zone 3 Subtotal	**$353**	**$1,832**	**$1,930**	**$0**	**$0**	**$10,994**	**$21,493**	**$0**	**$0**	**$0**	**$0**	**$0**	**$36,552**
	TIF Zone 4 Projects													
4.1.B	Tukwila International Boulevard from S Boeing Access Road to Green River: Bicycle Facility Improvement						$2,040							**$2,040**

TABLE 20 – RECOMMENDED TRANSPORTATION IMPROVEMENTS BY PRIORITY (COSTS IN THOUSANDS)

		Priority A (Pre 2030)				Priority B (Pre 2030)				Priority C (Post 2030)				
#	Project Description	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Total
4.2.B	S 112th Street from Tukwila International Boulevard to E Marginal Way S: Bicycle Facility Improvement						$786							**$786**
4.3.C	S Boeing Access Road and E Marginal Way S/Tukwila International Boulevard: Intersection Improvement									$259				**$259**
4.4.B	S Boeing Access Road from Martin Luther King Junior Way S to E Marginal Way S: Walkway Improvement							$3,062						**$3,062**
4.5.A	S Boeing Access Road from Airport Way S to I-5: Bridge Replacement	$30,734												**$30,734**
4.6.B	S Ryan Way from Martin Luther King Junior Way S to 51st Avenue S: Bicycle Facility Improvement						$44							**$44**
4.7.C	S 102nd Street and S Norfolk Street from W Marginal Place to Airport Way S: Bicycle Facility and Sidewalk Improvement										$5,907			**$5,907**
4.8.C	E Marginal Way from N City Limits to S Boeing Access Road: Bicycle Facility Improvement										$8,861			**$8,861**
4.9.C	W. Marginal Place S from 14th Avenue S to Existing Trail: Bicycle Trail Extension										$1,486	$1,485		**$2,971**
	TIF Zone 4 Subtotal	**$30,734**	**$0**	**$0**	**$0**	**$0**	**$2,870**	**$3,062**	**$0**	**$259**	**$16,254**	**$1,485**	**$0**	**$54,664**

TABLE 20 – RECOMMENDED TRANSPORTATION IMPROVEMENTS BY PRIORITY (COSTS IN THOUSANDS)

		Priority A (Pre 2030)				Priority B (Pre 2030)				Priority C (Post 2030)				
#	Project Description	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Auto Projects	Bike Projects	Pedestrian Projects	Transit Projects	Total
Citywide Total		**$64,056**	**$5,264**	**$6,559**	**$5,475**	**$38,625**	**$28,326**	**$29,925**	**$0**	**$34,646**	**$18,190**	**$4,951**	**$0**	**$236**
Priority A (Pre 2030) Total														$81,354
Priority B (Pre 2030) Total														$96,876
Priority C (Post 2030) Total														$57,787
Grand Total														$236,017

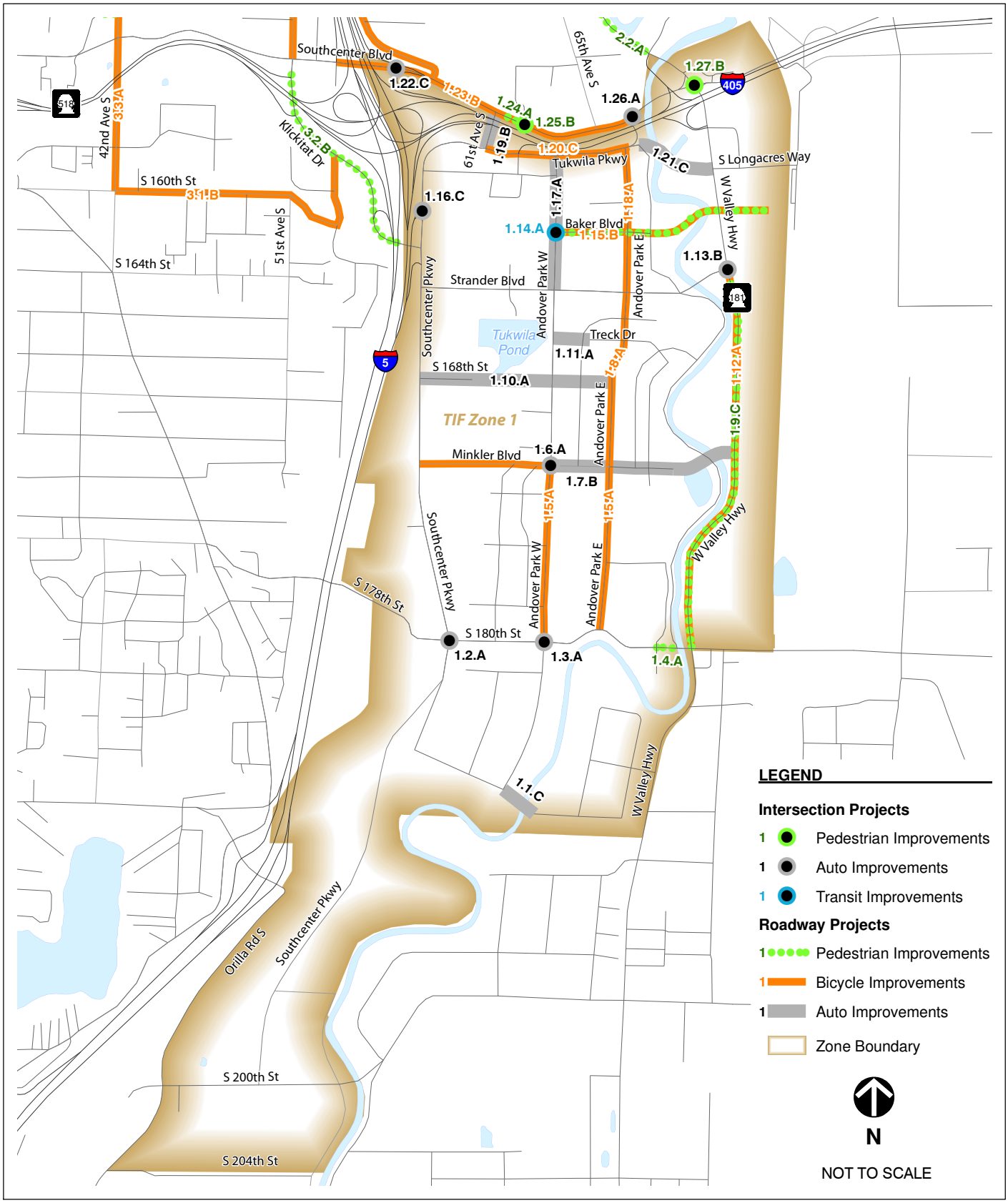
TIF ZONE 1 2030 RECOMMENDED TRANSPORTATION IMPROVEMENTS

This section provides details on the 2030 recommended transportation improvements that are located in Tukwila Transportation Impact Fee Zone 1. The projects shown in **Table 21** are based on the evaluation of existing and 2030 transportation operations, the City's 2012-2017 Transportation Improvement Program, and the Walk and Roll Plan. Table 20 also presents estimated costs and **Figure 33** shows the location of these projects.

TABLE 21 – RECOMMENDED TRANSPORTATION IMPROVEMENTS IN TIF ZONE 1

Project	Location	Improvement	Priority A-B Cost (Thousands)	Priority C Cost (Thousands)
1.1.C	South of S 180th Street from Southcenter Parkway to West Valley Highway	New Roadway Construction		$33,316
1.2.A	S 180th St & Southcenter Pkwy	Add a westbound/southbound left turn lanes, restriping, path on 178th St	$2,057	
1.3.A	S 180th St & Andover Park W	Restripe, modify signal, add bicycle lanes	$179	
1.4.A	S 180th St from Sperry Dr to Green River Bridge	Add sidewalks	$125	
1.5.A	Andover Park E or W	Add bicycle lanes, restriping	$69	
1.6.A	Minkler Blvd & Andover Park W	Realign intersection approaches	$1,551	
1.7.B	Minkler Blvd Extension to West Valley Hwy	Widen roadway, construct new bridge over Green River, new signals	$38,440	
1.8.A	Andover Park E from Minkler Blvd to Strander Blvd	Add bicycle lanes, restriping	$69	
1.9.C	West Valley Hwy from Strander Blvd to S 180th St	Sidewalk improvements		No Cost
1.10.A	S 168th S (Pond Street) from Southcenter Blvd to Andover Park E	Construct new two-lane street with sidewalks, planter strip, and on-street parking	$17,425	
1.11.A	Treck Dr between Andover Park E and Andover Park W	Extend Treck Dr to provide a connection	$1,930	
1.12.A	Green River and Interurban Trail near West Valley Hwy	Construct bicycle access from West Valley Hwy, add wayfinding signs	$173	
1.13.B	Strander Blvd & West Valley Hwy	Strander Blvd Extension Modifications	$2,490	
1.14.A	Andover Park W & Baker Blvd	Construct Transit Center	$5,475	
1.15.B	Baker Boulevard Corridor	Pedestrian and bicycle improvements to connect Urban Center to Tukwila Station	$8,760	
1.16.C	I-5 Northbound Off-ramp & Southcenter Pkwy	Realign intersection to be opposite WSDOT ramp		$1,071
1.17.A	Andover Park W from Strander Blvd to Tukwila Pkwy	Add left turn lanes	$1,461	
1.18.A	Andover Park E Bicycle Lane from Strander Blvd to Tukwila Pkwy	Restripe roadway to provide bicycle lanes	$470	

TABLE 21 – RECOMMENDED TRANSPORTATION IMPROVEMENTS IN TIF ZONE 1				
1.19.B	Southcenter Blvd & 61st Ave S	Add a raised island to accommodate free southbound right turns. Add C-curb, signal modifications	$185	
1.20.C	Tukwila Pkwy from 61st Ave S to 66th Ave S	Add a multi-use path		$1,531
1.21.C	Tukwila Pkwy from 68th Ave S to West Valley Hwy	Extend Tukwila Pkwy (WSDOT project)		$TBD
1.22.C	Southcenter Blvd & I-405 SB Off-ramp	New signal (WSDOT project)		$TBD
1.23.B	Southcenter Blvd from 53rd Ave S to 66th Ave S	Add bicycle lanes	$10,132	
1.24.A	Southcenter Blvd from 61st Ave S to 62nd Ave S	Add a sidewalk	$64	
1.25.B	Southcenter Blvd & 65th Ave S	Add a crosswalk and short sidewalk segment	$337	
1.26.A	Southcenter Blvd & 66th Ave S	Restripe westbound approach lane configuration to one through lane and two left turn lanes	$50	
1.27.B	Southcenter Blvd & West Valley Hwy	Reduce southbound right turn curb radius, add textured crosswalks	$248	
		TOTAL	**$91,690**	**$35,918**



FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig33_zone1.mxd

CITY OF TUKWILA - TIF ZONE 1 2030 PROJECTS

FIGURE 33

Recommended Improvements in TIF Zone 1

Project 1.1.C. South of S 180th Street from Southcenter Parkway to West Valley Highway: New Roadway Construction

To reduce the travel demand on S 180th Street from Tukwila Valley South developments, a new roadway connecting Southcenter Parkway with West Valley Highway is needed by 2030. A corridor between S 188th Street (S Glacier Street) and S 190th Street was identified as a potential corridor. It is important for the City to discuss this potential roadway with City of Kent as well as the Tukwila South developer. Based on preliminary data from the Tukwila travel model, this roadway should be five lanes between Southcenter Parkway and Andover Park West and three lanes between Andover Park West and West Valley Highway. In addition, since this roadway provides an opportunity to enhance pedestrian and bicycle connections between Southcenter Parkway and West Valley Highway, any new alignment should include bicycle lanes and sidewalks or a multi-use trail.

General location of a new connection between Southcenter Parkway and West Valley Highway. Exact alignment will need to be determined as part of a subsequent study.

South 180th Street Corridor Improvement Options

As documented in earlier chapters, the S 180th Street corridor between Southcenter Parkway and West Valley Highway is characterized by high existing and forecast 2030 traffic volumes and no bicycle lanes (standard sidewalks are provided, however). Improvements in this corridor affect projects along S 180th Street, W Valle Hwy, and Minkler Boulevard. These conditions translated into poor existing and forecast bicycle and auto LOS. To address the poor operations of the corridor, Fehr & Peers evaluated several options, including those listed below:

- Widening S 180th Street to accommodate bicycle lanes per the Walk and Roll plan ($9,631,000);
- Widening S 180th Street to accommodate bicycle lanes and an additional through lane in each direction ($36,829,000);
- Constructing a new street between Southcenter Parkway and West Valley Highway south of S 180th Street (exact alignment not yet determined - $33,316,000); and
- Extending Minkler Boulevard across the Green River to connect with West Valley Highway ($38,440,000).

While there is value in each of the projects listed above, given revenue constraints it was determined that only one project could reasonably be implemented by 2030. The ultimate recommendation to address the poor bicycle and auto LOS along the S 180th Street corridor is the Minkler Boulevard extension across the Green River. While this project is the most expensive option, the costs of all three auto LOS improvement projects are nevertheless similar. Minkler Boulevard's central location is favorable as it provides more accessibility benefits for cyclists, pedestrians, and autos than the other options. The benefits of another crossing of the Green River outweigh the slight cost differences compared to the S 180th Street widening option.

Project 1.2.A. S 180th Street and Southcenter Parkway: Intersection Improvement

The signalized intersection of S 180th Street and Southcenter Parkway is expected to operate at LOS F for PM, midday, and Saturday peak periods in 2030. While this intersection performed adequately under existing conditions, the new employment and housing growth anticipated in Tukwila South is projected to dramatically increase the traffic volume through this intersection. The current north-south split phasing of this intersection is not efficient for the anticipated high volume and new growth in north-south through movements. The westbound to southbound left turn movement is also expected to increase dramatically, overwhelming the single left turn lane at this intersection.

- 2010 level of service: LOS A (9 seconds of delay) in AM peak hour and LOS D (54 seconds of delay) in PM peak hour.
- 2030 level of service: LOS C (38 seconds of delay) in AM peak hour and LOS F (132 seconds of delay) in PM peak hour.

Traffic congestion along the entire S 180th Street corridor is expected to become problematic by 2030. Therefore, for this location and the other intersections along S 180th Street, several options were explored to reduce congestion and provide more pedestrian and bicycle connections through the area. The previous page discusses these options. Ultimately, the Minkler Boulevard extension across the Green River by 2030 was recommended.

In addition to the potential corridor improvements, the Development Agreement for the Tukwila South development between the City and La Pianta executed on June 8, 2009 includes the following section stating as follows:

> The Administration of the City shall recommend to the City Council that the realignment of South 178th Street, as depicted in the 90% construction drawings, be added to the City's Capital Improvement Plan.

While this project has been added to the CIP, it is currently shown as 100% developer financed.

Differences in this analysis versus the Tukwila South EIS

-Tukwila South EIS utilized 2004 counts, whereas this report used 2010 counts to establish a baseline. Levels of traffic congestion have increased significantly during the PM peak hour from 2004 to 2010.

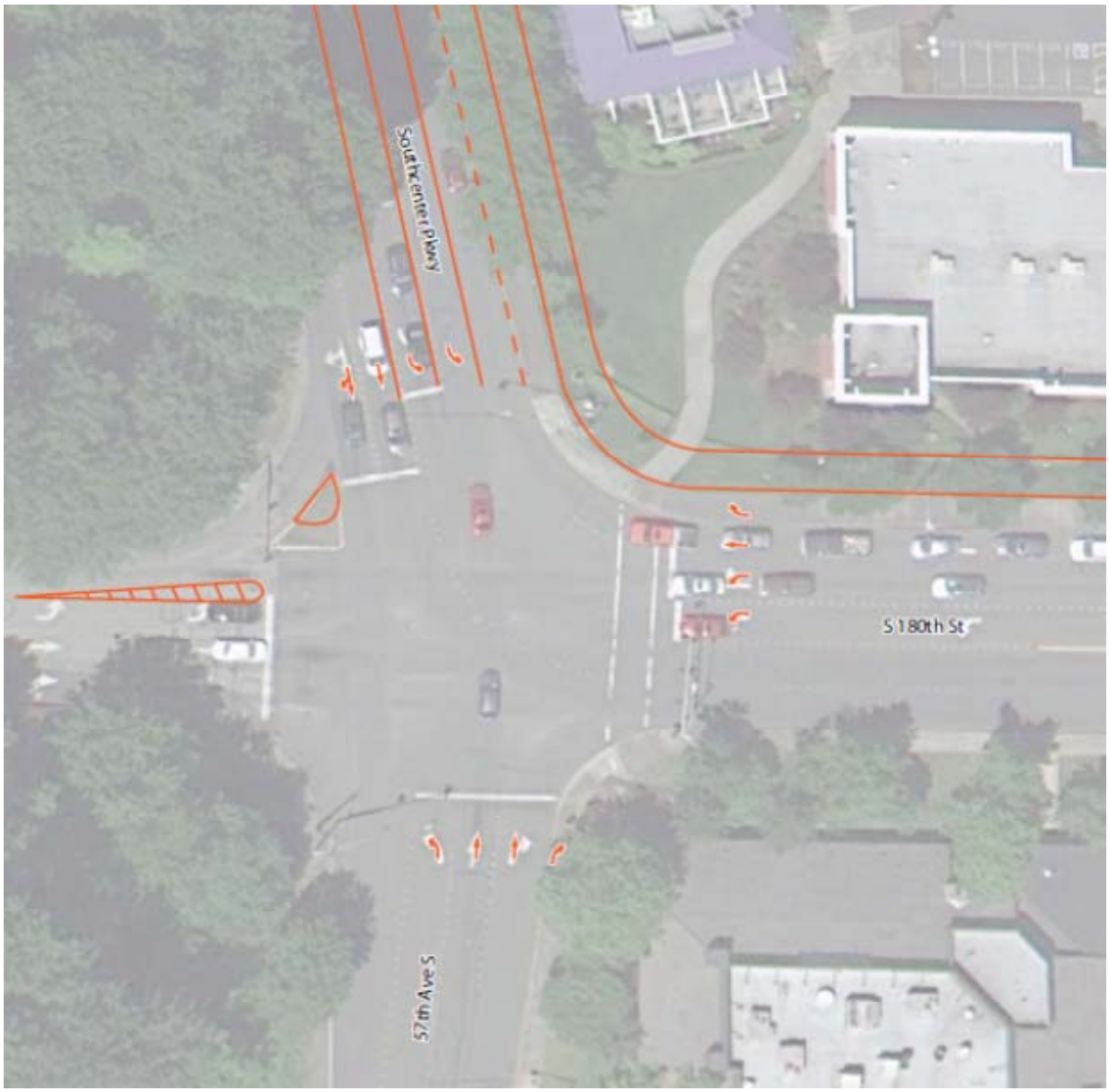
-Tukwila South EIS assumed that the S 178th St realignment project would be done as a part of the Tukwila South Development. The EIS did not show the 2015 and 2030 LOS at these intersections without this realignment project, making comparison to this report difficult.

-Tukwila South EIS concluded that the Tukwila concurrency standard in the TUC in 2015 would be met with averaged LOS D under a method not adopted by the City. As a part of the Transportation Element update, Fehr & Peers updated the concurrency report for 2016, finding that S 180th Street corridor would operate at LOS F in 2016, not meeting the City's standard.

Recommendation

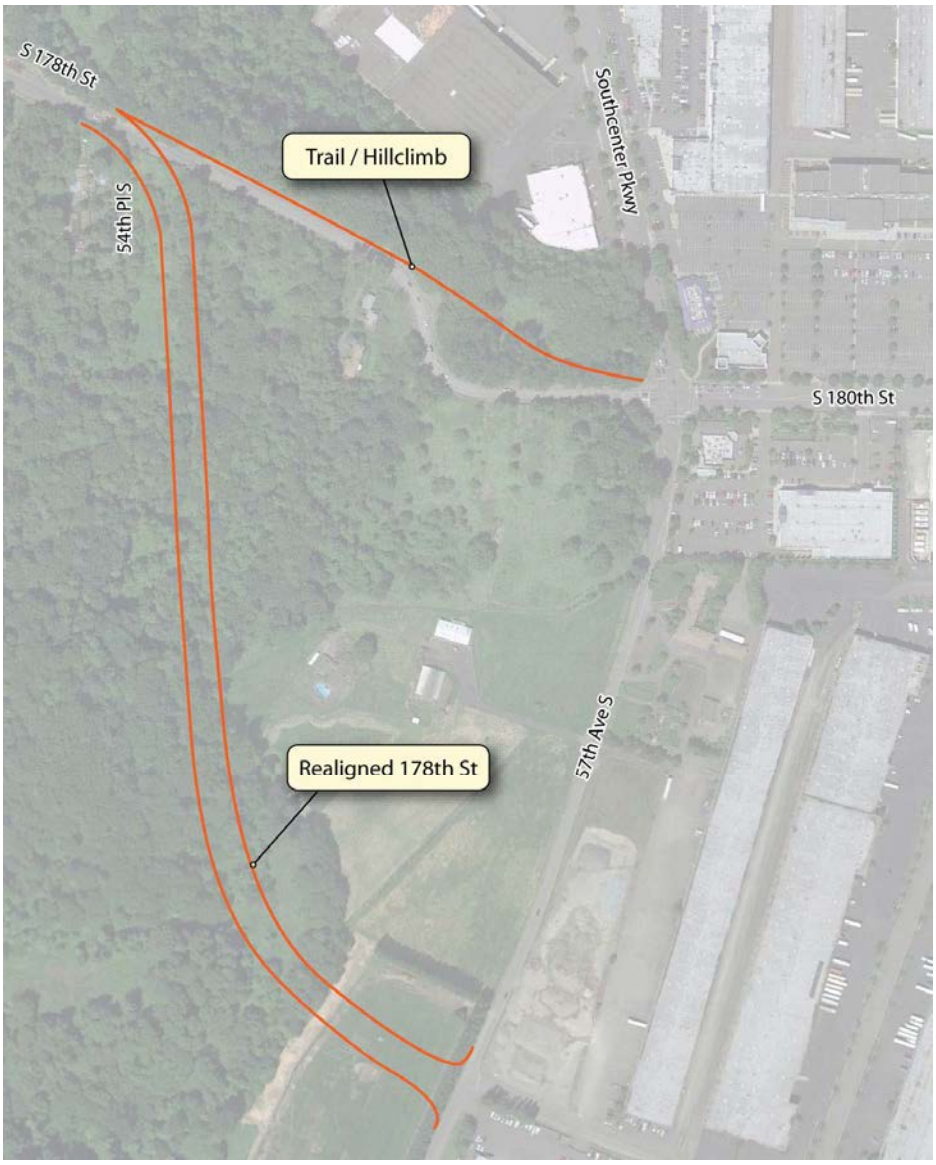
1. If no realignment of S 178th Street takes place, then it is recommended that a new westbound left turn lane and southbound left turn lane be added at this location. The north-south split phasing should also be eliminated by restriping the southbound approach. In addition, the intersection would benefit from a westbound right turn overlap phase.
2. If S 178th Street is realigned, then the intersection should be reconfigured as follows:
    a. Construct the westbound approach with dual left turn lanes and a single right turn lane with overlap phasing.

b. Construct the northbound approach with two through lanes and a right turn lane.
c. Construct the southbound approach with two through lanes and at least one left turn lane.



Recommended lane configuration with no realignment to S 178th Street and no new Green River crossings.

3. Regardless of which improvement option is selected at this location, pedestrian access improvements should be included on S 178th Street, as this is one of the only connections between Tukwila and SeaTac. If S 178th Street is realigned, it is recommended that a pedestrian path/hill climb be installed in the vicinity of the existing S 178th Street alignment to provide more direct access to the retail areas along Southcenter Parkway. If S 178th Street is not realigned, then it is recommended that sidewalks be added on at least one side of the street.



Recommended pedestrian improvements if S 178th Street is realigned.

Project 1.3.A. S 180th Street and Andover Park W: Intersection Improvement

The signalized intersection of S 180th Street and Andover Park West is expected to operate at LOS F during the PM peak period in 2030. With the anticipated growth in Tukwila South, higher traffic volumes are expected along the S 180th corridor. New development is also expected along Andover Park West south of S 180th Street, increasing demand on the northbound approach to the intersection.

The bullets below summarize the intersection operations under existing and 2030 conditions.

- 2010 level of service: LOS B (18 seconds of delay) in AM peak hour and LOS D (43 seconds of delay) in PM peak hour.
- 2030 level of service: LOS C (34 seconds of delay) in AM peak hour and LOS F (95 seconds of delay) in PM peak hour.

The south leg of this intersection is privately owned. Therefore any improvements at this intersection will require that the City work with the property owners located on the south side of S 180th Street. Also, as described in Project 1.2.A, the potential new Minkler Boulevard extension across the Green River could affect operations at this intersection.

Table 22 identifies how the various transportation network changes influence PM peak hour operations at this intersection.

TABLE 22 – S 180TH STREET/ANDOVER PARK WEST PM PEAK HOUR INTERSECTION OPERATIONS

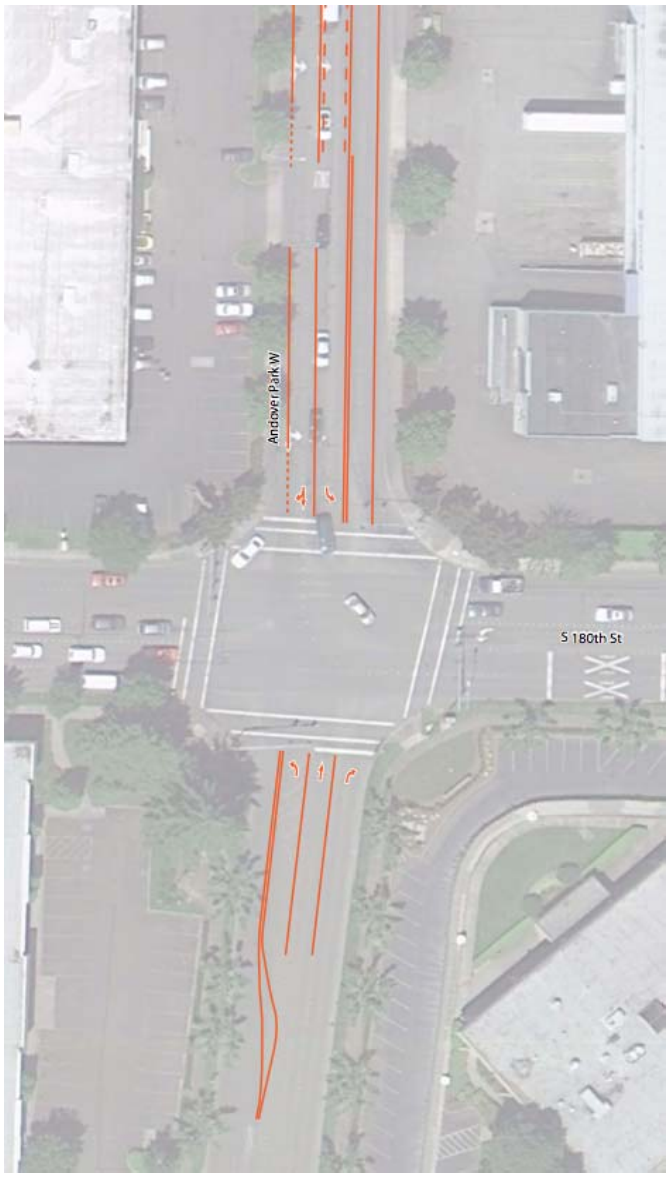
2030 No Action (Delay / LOS)	2030 Reconfigured Intersection	2030 Reconfigured Intersection and Minkler Bridge
95 / F	66 / E	43 / D

Fehr & Peers, 2011

There can be substantial improvements to traffic operations from a relatively simple reconfiguration of the intersection. The table also shows that the Minkler Boulevard Bridge provides additional congestion relief to this intersection by diverting some of the S 180th Street traffic to the north. The combination of these elements results in LOS D operations at this location.

Recommendation

1. Redesign the intersection to include the following features:
    a. Restripe the northbound approach to include a single left, through, and right turn lane.
    b. Restripe the southbound approach to include a single left turn lane and a shared through-right lane.
    c. Eliminate the north-south split phasing.
    d. Add protected-permitted left turn phasing on all approaches.
2. Add bicycle lanes on the north leg and work with the property owners to connect these lanes with the bicycle facility in the Tukwila South development (this facility ultimately extends to the Green River trail). Note that this reconfiguration can be made with or without the addition of bicycle lanes.



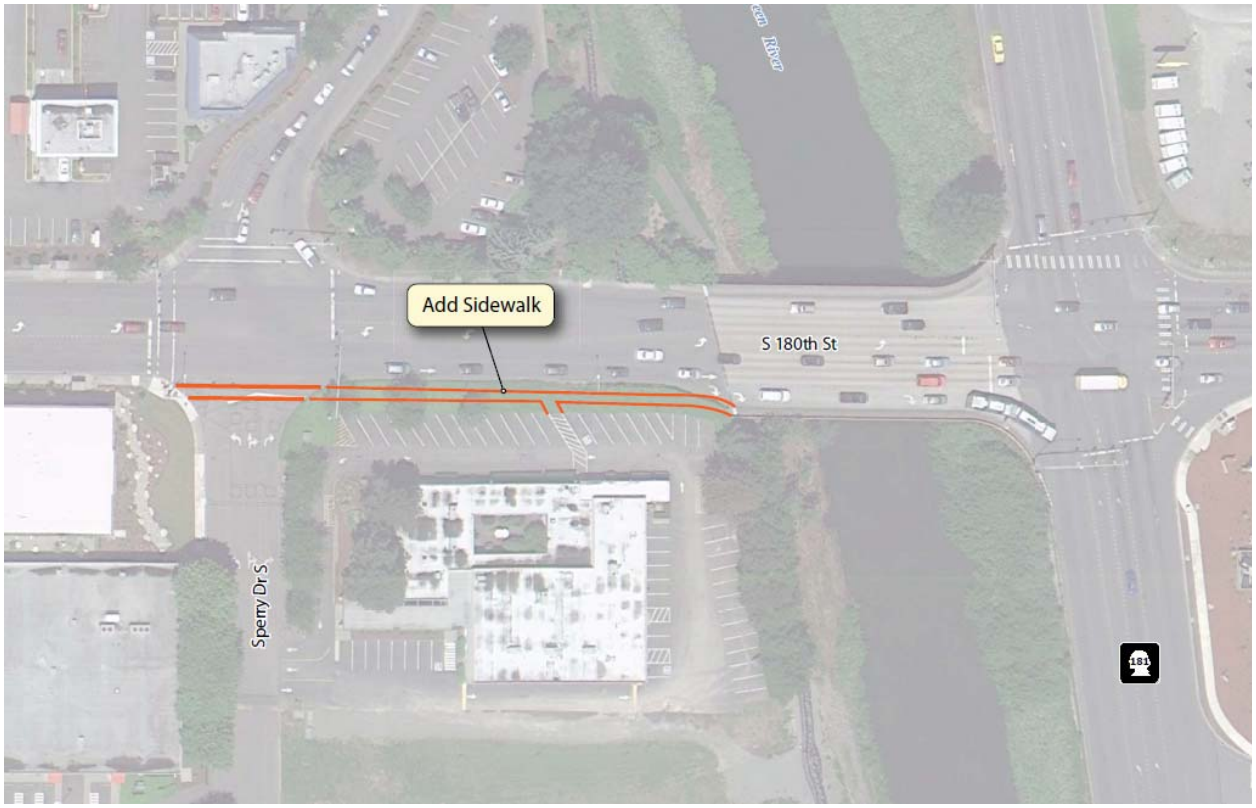
Recommended configuration for the S 180th Street/Andover Park West intersection.

Project 1.4.A. S 180th Street from Sperry Drive S to Green River Bridge: Sidewalk Improvement

One sidewalk gap exists along the south side of the S 180th Street corridor between the Sperry Drive S intersection and the Green River Bridge. This roadway segment has a pedestrian LOS E, as shown in Figure 16C.

Recommendation

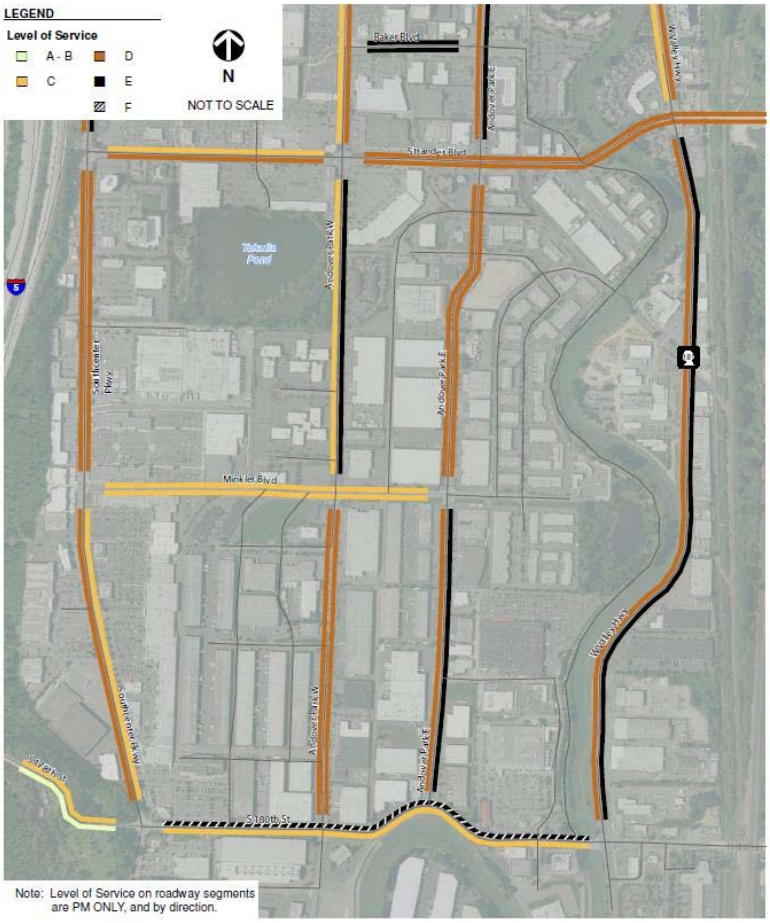
Provide a sidewalk on the south side of S 180th Street to fill the gap.



Project 1.5.A Andover Park E or Andover Park W from Minkler Boulevard to S 180th Street: Bicycle Facility Improvement

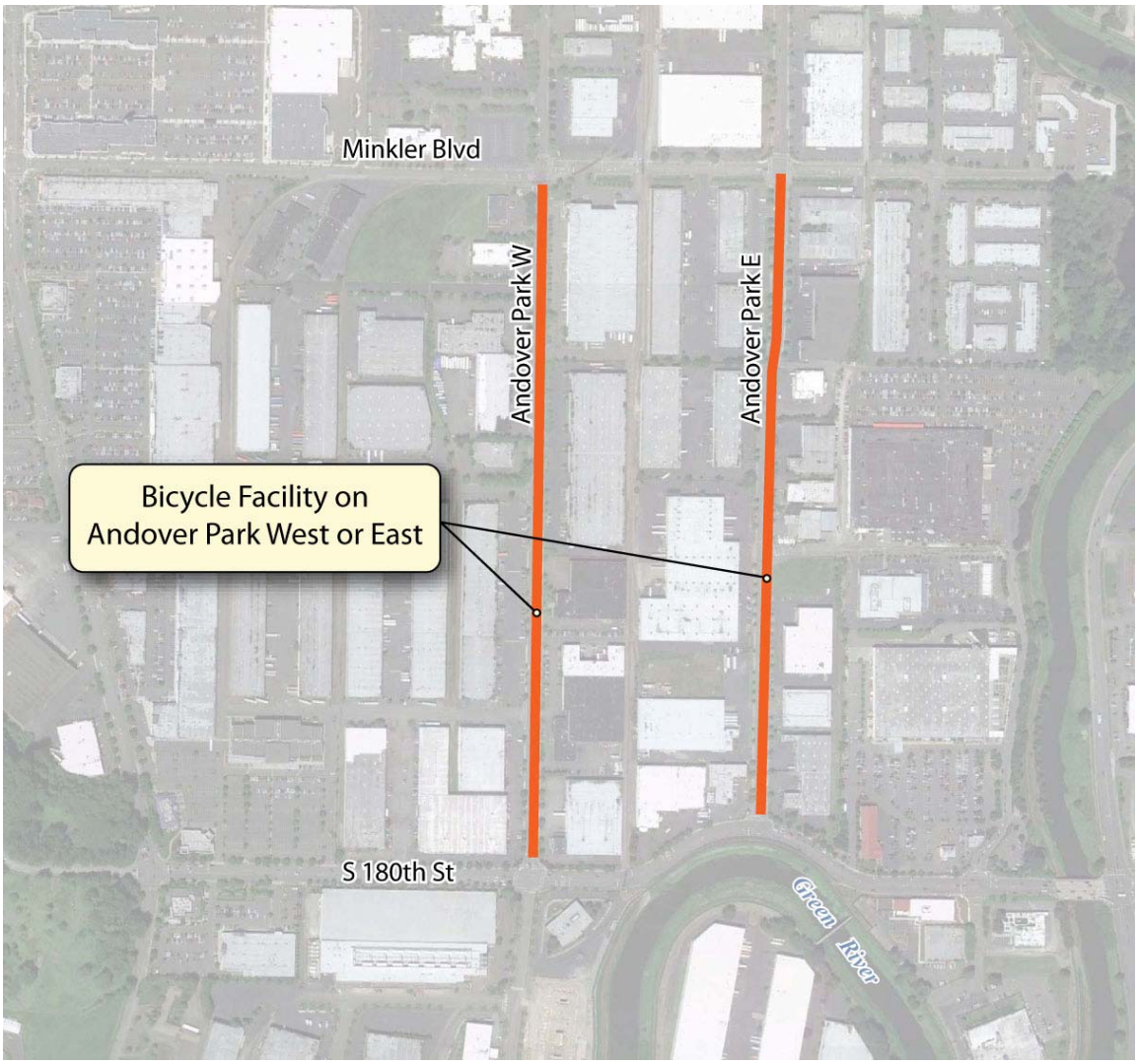
The existing conditions LOS for bicycles on the arterials in the Southcenter area are in the range of LOS D to F on many streets. The goal of project(s) in this corridor is to provide a north-south bike facility to connect to trail systems on the north and south ends.

It would be difficult to add bicycle facilities on Southcenter Parkway due to high volumes of vehicles and limited right-of-way. However, there may be opportunities to add bicycle facilities on Andover Park West or Andover Park East. In these corridors, the lack of bicycle lanes or shoulders to separate the cyclists from vehicles and the number of driveway conflicts are the main causes of the poor levels of service. Projects 1.8.A and 1.18.A recommend additional bicycle lanes on Andover Park East between Minkler Boulevard and Tukwila Parkway.



Recommendation

Add bicycle lanes on Andover Park West or Andover Park East between Minkler Boulevard and S 180th Street by restriping the traffic lanes from four to three lanes.


Minkler Blvd
Andover Park W
Andover Park E
Bicycle Facility on
Andover Park West or East
S 180th St
Green River

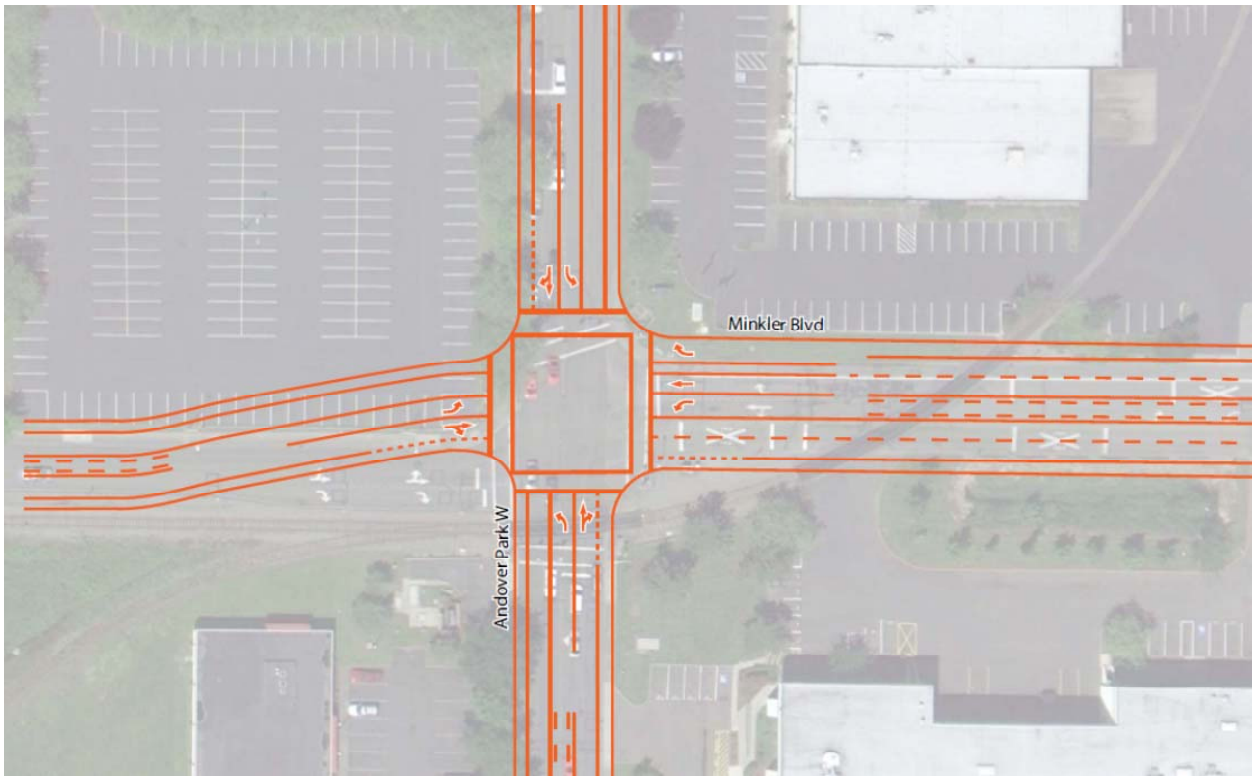
Project 1.6.A. Minkler Boulevard and Andover Park W: Intersection Improvement

The signalized intersection of Minkler Boulevard and Andover Park West has a skewed east-west approach that leads to inefficient traffic signal phasing. To improve overall intersection operations, it is recommended that the west leg of the intersection be realigned to match the location of the east leg. Because this realignment would occur on private property, it would require right-of-way acquisition.

If the proposed Minkler Boulevard crossing of the Green River is pursued, this realignment becomes even more important since it is recommended that Minkler Boulevard be widened to five lanes between Andover Park West and West Valley Highway.

Recommendation

Realign the eastbound approach of the intersection to squarely meet the westbound approach.



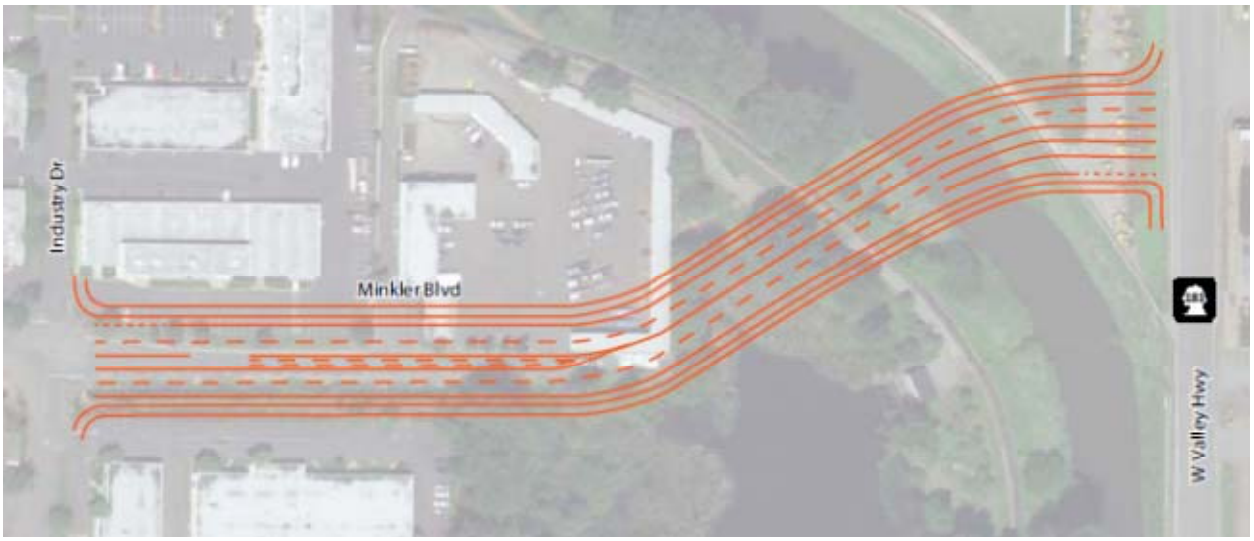
Proposed realignment of Minkler Boulevard (assuming the five lane configuration required for the Green River crossing). Note that the potential road diet and bicycle lanes on Andover Park West are also shown in this figure.

Project 1.7.B. Minkler Boulevard from Andover Park W to W Valley Highway: Roadway Extension

As discussed in project 1.2.A, the Southcenter area would benefit from additional connections to West Valley Highway over the Green River. The extension of Minkler Boulevard is one of the obvious choices since it is one of only a few east-west arterials and is located in the center of the Southcenter area. The recommended action is to extend Minkler Boulevard from Industry Drive to West Valley Highway while widening Minkler Boulevard to five lanes between Andover Park West and Industry Drive. However, there are many challenges that need to be overcome, one of which is crossing over the critical wetlands along the west side of the Green River and coordination with WSDOT at the West Valley Highway intersection.

Recommendation

1. Conduct a feasibility study to extend Minkler Boulevard from Industry Drive to West Valley Highway while widening the roadway to five lanes between Andover Park West and Industry Drive.
2. Develop a multimodal corridor improvement plan for the entire section between Southcenter Parkway to West Valley Highway. Based on the preliminary data from the Tukwila travel model, Minkler Boulevard should be four to five lanes (depending on the need for a center turn lane) between Andover Park West and West Valley Highway. The route should also include bicycle lanes, consistent with the Bicycle Friendly Route designation from the Walk and Roll plan. Sidewalks and streetscape improvements should be provided consistent with the Sub-Urban Corridor designation in the Tukwila Urban Center Plan for the Southcenter area.

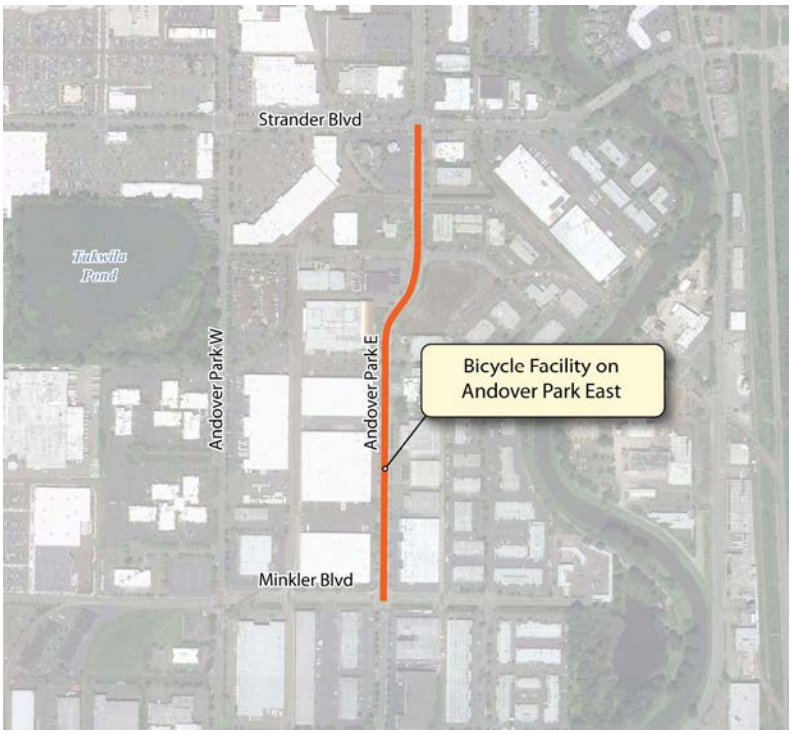


Potential alignment for the Minkler Boulevard bridge over the Green River.

Project 1.8.A. Andover Park E from Minkler Boulevard to Strander Boulevard: Bicycle Facility Improvement

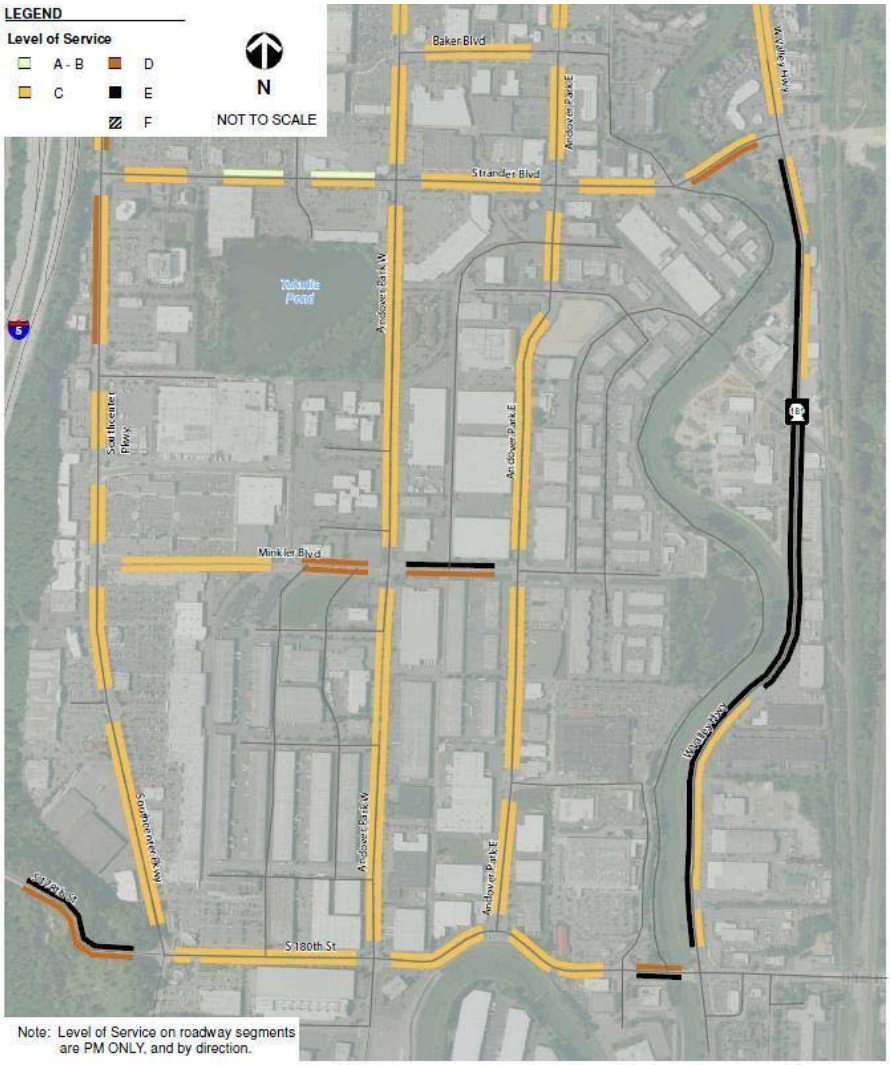
This project will connect to bicycle facilities to the south on Andover Park East or West (project 1.5.A) and facilities to the north on Andover Park East (project 1.18.A).

The recommendation is to add bicycle lanes on Andover Park East, potentially in conjunction with a road diet that would restripe the travel lanes from four to three lanes. The location of this project is shown below.



Project 1.9.C. W Valley Highway from Strander Boulevard to S 180th Street: Sidewalk Improvement

The West Valley Highway corridor lacks a sidewalk in many locations. The high vehicle speeds and volumes lead to poor pedestrian levels of service (including a long segment of LOS E on both sides). Pedestrians can use the Green River or Interurban Trails which parallel the corridor, however, these trails have limited accessibility to and from West Valley Highway.



Recommendation

Require property owners along this corridor to provide sidewalks as redevelopment occurs; the improvements are not recommended as a City project.

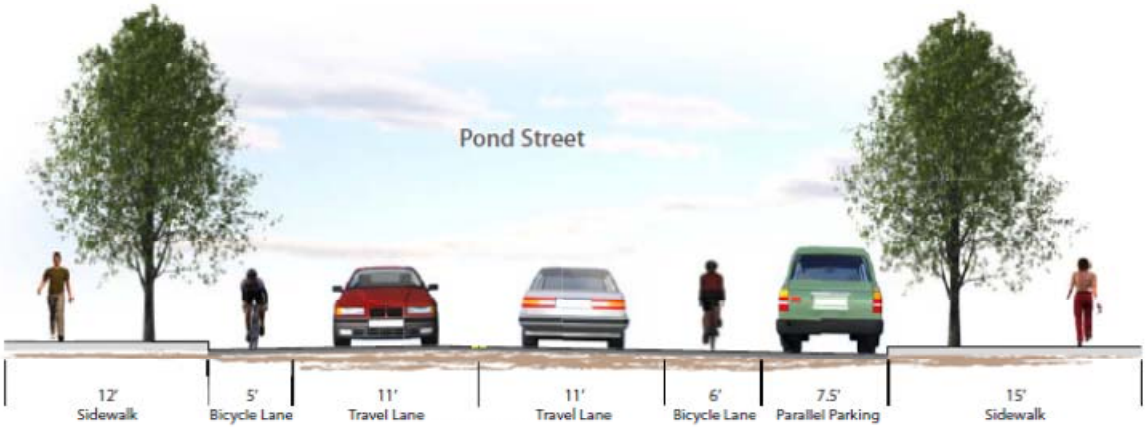
Project 1.10.A. S 168th (Pond) Street from Southcenter Boulevard to Andover Park E: New Street Construction

This is a new street proposed to be constructed on the south side of Tukwila Pond. The concept of a new road following this alignment is supported in the Southcenter Subarea Plan and is included in the most recent TIP. This road is needed to break up a large block defined by Strander Boulevard and Minkler Boulevard. It may be difficult to construct this roadway without redevelopment occurring on the adjacent properties.

Recommendation

1. Conduct a feasibility study to determine alignment and identify engineering constraints.
2. Construct S 168th Street from Southcenter Parkway to Andover Park East. Follow design recommendations in the Tukwila Urban Center Plan for the Southcenter area (see cross section below).

Potential alignment for S 168th Street/Pond Street.



Potential cross section for S 168th Street/Pond Street alignment (looking east).

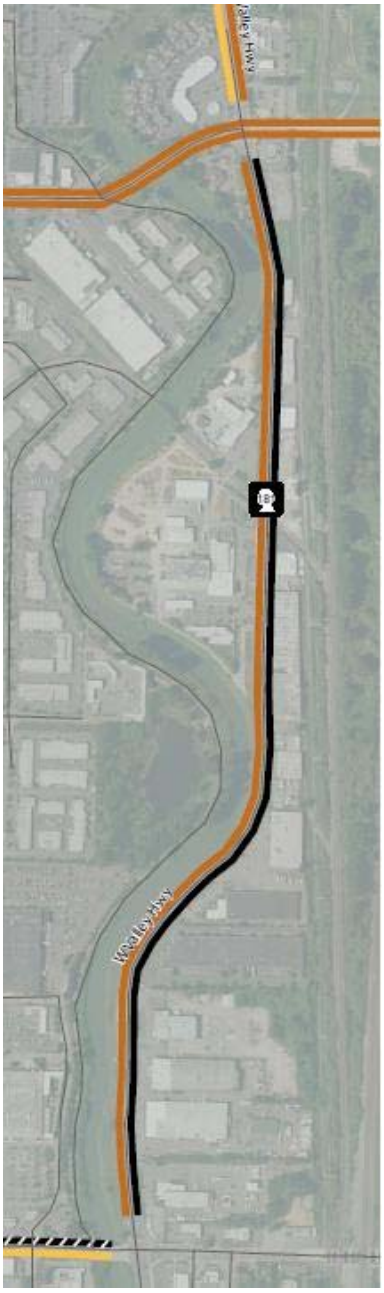
Project 1.11.A. Treck Drive from Andover Park W to Andover Park E: New Street Construction

Treck Drive currently ends at the railroad track crossing east of Andover Park East and does not provide a connection to Andover Park West.

Recommendation

In order to increase network connectivity and emergency response times (and potentially improve LOS at the Andover Park West and Strander Boulevard intersection) in the Southcenter area, Treck Drive should be extended west to Andover Park West. This will require installation of an at-grade railroad crossing and the construction of a new roadway west of the railroad tracks.

Project 1.12.A. Green River and Interurban Trails from West Valley Highway: Bicycle Facility Improvement and Signage



Due to high vehicle volumes and speeds along West Valley Highway, the bicycle LOS is E/F in the northbound direction and D in the southbound direction. No bicycle lanes are provided and the shoulders are narrow in spots, providing little separation from vehicles. While the on-street service is poor along this corridor, the Interurban Trail and Green River Trail provide cyclists with an off-street option. However, there are limited opportunities to access these trails and no wayfinding signage.

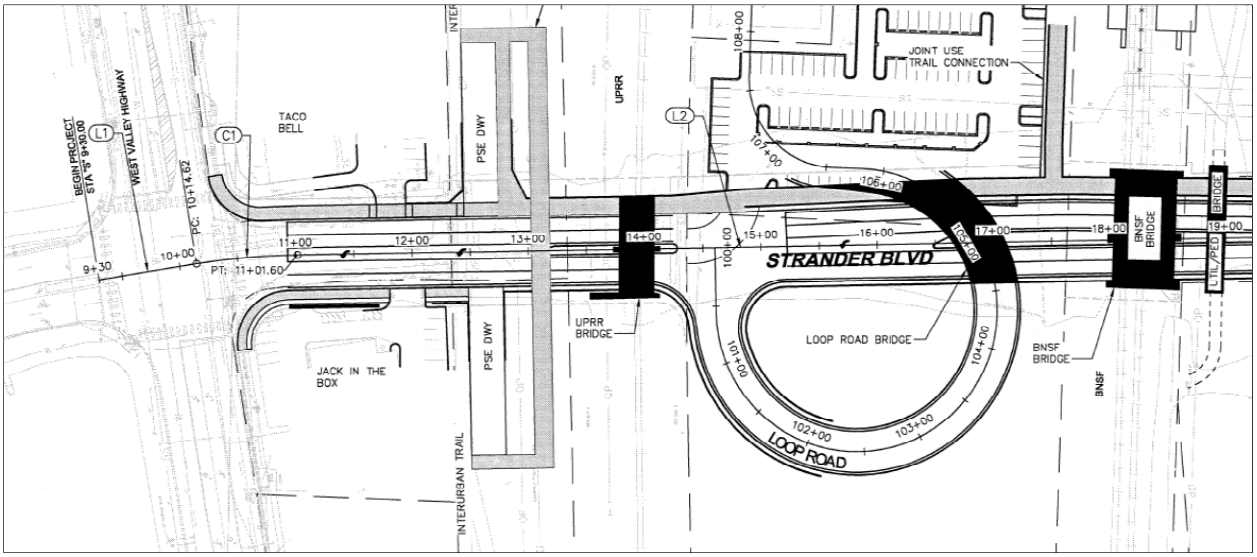
Recommendation

1. Work with property owners along the east side of West Valley Highway to gain more access to the Interurban Trail between Strander Boulevard and S 180th Street.
2. Pursue the extension of Minkler Boulevard across the Green River and provide access to the Green River Trail as part of the new bridge (see project 13).
3. Consider access improvements to the Green River Trail near S 180th Street. For example, there is an informal trail between Sperry Drive and the Green River trail south of S 180th Street that could be improved.
4. Pursue a rails-to-trails project if the existing rail bridge across the Green River south of Strander Boulevard becomes an abandoned rail corridor.
5. Provide wayfinding signs at the following locations:
    a. West Valley Highway/S 180th Street intersection (access to both Green River and Interurban Trails)
    b. Sperry Drive (access to Green River Trail)
    c. S 180th Street/72nd Avenue S (Interurban Trail)
    d. New access easements that may be gained between the Interurban Trail and West Valley Highway between Strander Boulevard and S 180th Street
    e. West Valley Highway/Minkler Boulevard (Green River Trail and potentially the Interurban Trail if the extension of Minkler Boulevard is built)
    f. West Valley Highway/Strander Boulevard (Interurban Trail)
    g. Christensen Road/Strander Boulevard (Green River Trail)
    h. Baker Boulevard/Andover Park East (Green River Trail)
    i. West Valley Highway and proposed multi-use trail extending from Baker Boulevard (Interurban and Green River Trails)
    j. West Valley Highway/Longacres Way (Interurban Trail)

Project 1.13.B Strander Boulevard and W Valley Highway: Intersection Improvement

The extension of Strander Boulevard from West Valley Highway to Oakesdale Avenue was included in the 2030 model. The travel demand in the corridor will increase when the extension project is completed. The intersection of Strander Boulevard and West Valley Highway is expected to operate at LOS F during the PM peak in 2030 with the geometry planned as of July 2011.

- 2010 level of service: LOS B (16 seconds of delay) in AM peak hour and LOS D (39 seconds of delay) in PM peak hour.
- 2030 level of service with the planned geometry and signal operation: LOS D (46 seconds of delay) in AM peak hour and LOS F (greater than 150 seconds of delay) in PM peak hour.



The proposed schematic roadway drawing of Strander Boulevard east of West Valley Highway (drawing as of July 2011).

Recommendation

Modify the proposed Strander Boulevard extension project design to include the following:

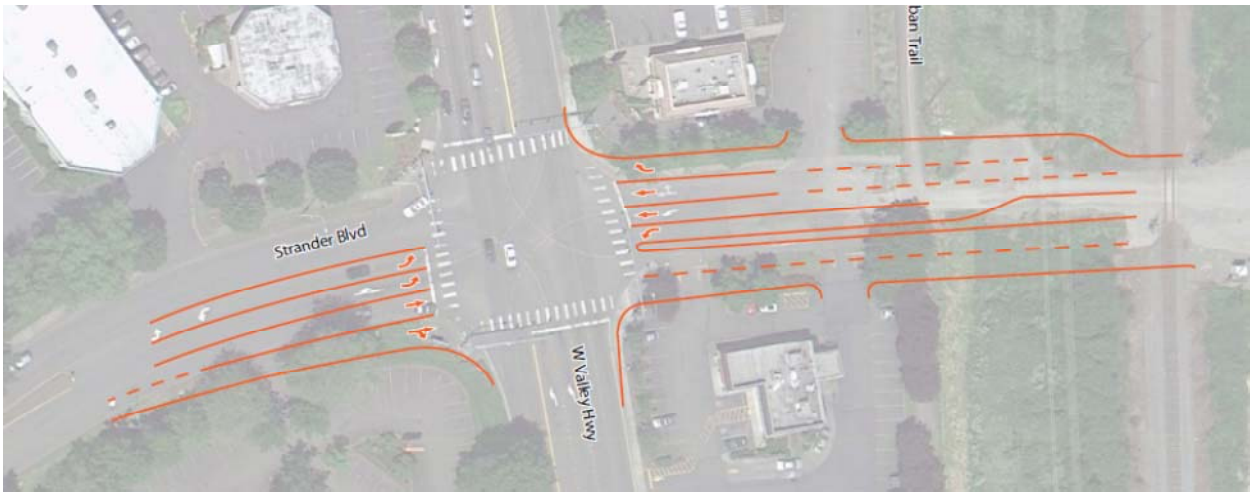
k. Add westbound to northbound right turn lane. At minimum, this lane should be 300 feet long (300 feet is the distance from the intersection to the UPRR tracks). A 500 foot turn lane would be preferable given the turning volume; however, a longer lane would require a longer bridge span of the UPRR tracks. This could lead to a steeper grade from the UPRR underpass to the West Valley Highway intersection, and consequently, higher costs.

l. Increase the length of the westbound to southbound left turn pocket. This turn pocket should be as long as possible while retaining the central bridge columns under the UPRR tracks.

m. Widen the eastbound approach to include two left turn lanes, a through lane, and a shared through-right lane.

n. Add right turn overlap phases to the southbound and westbound right turn movements.

o. Add sidewalks on the south side of Strander Boulevard between the Green River bridge and the east City limit.



Recommended improvements at the Strander Boulevard/West Valley Highway intersection.

Based on plans from the City of Renton, the additional westbound to northbound right turn lane can be accommodated while preserving the fast food building at the northeast corner of the intersection. However, because of grade changes and the need for a retaining wall, the initially proposed 14 foot multi-use trail on the north side of Strander Boulevard between the Renton City limit and West Valley Highway may not be accommodated with the additional lane.

To preserve a trail connection between the Interurban Trail and the Green River trail, it is recommended that the proposed TIP project (see project 26) to construct a new pedestrian/bicycle bridge across the Green River, along with a connection to the Interurban Trail, be implemented. Depending on the alignment, this connection may also require a signalized crossing of West Valley Highway.

Implementing the intersection changes recommended result in a substantial decrease in delay to around 100 seconds in the PM peak hour, but this intersection is still forecasted to operate at LOS F.

Project 1.14.A. Baker Boulevard and Andover Park W: Tukwila Urban Center, Transit Center

This project, included in the TIP, will upgrade the transit center along Andover Park West near Baker Boulevard, improving multimodal travel choices in the Southcenter area.

Project 1.15.B. Baker Boulevard from Andover Park W to W Valley Highway: Pedestrian and Bicycle Facility Improvement

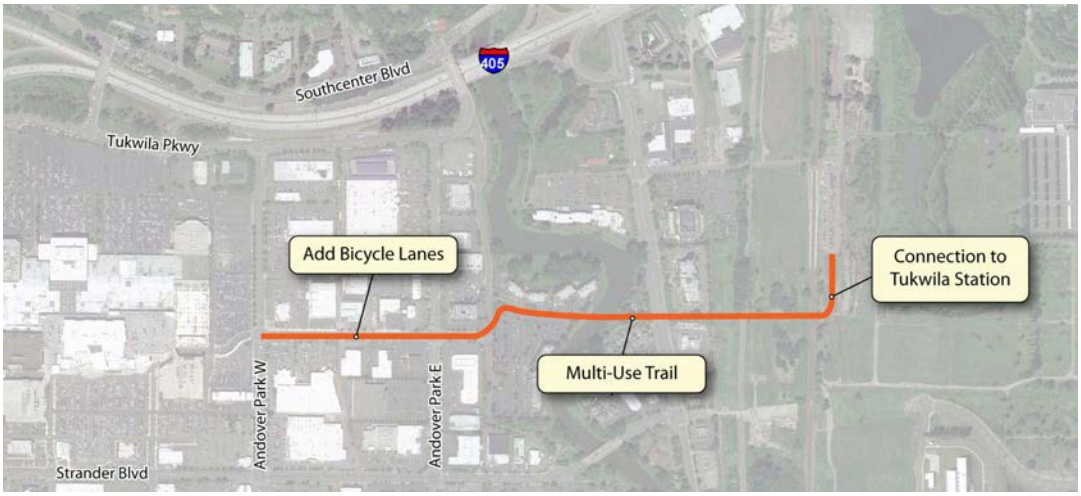
This project is related to project 1.5.A (which discusses bicycle deficiencies in the Southcenter Area) and connects to projects 1.11.A and 1.18.A (bike facilities on Andover Park East). This project consists of four components and will facilitate active transportation connections between the Tukwila Urban Center and the Sounder light rail station. It is needed to increase pedestrian mobility, improve access, and support more urban levels of development within walking distance of the Tukwila station.

The four components include:

- Between Andover Park West and Christensen Road, restripe Baker Boulevard to include two parking lanes, two bicycle lanes, and two travel lanes.
- Construct a pedestrian/bicycle bridge between the terminus of Baker Boulevard over the Green River to the Interurban Trail. Depending on final design, a signalized crossing of West Valley Highway may be required.

Potential alignment for the Pedestrian/Bicycle Bridge over the Green River.

- Connection from West Valley Highway to the Interurban Trail.
- Connection from the Interurban Trail to the Tukwila commuter rail/Amtrak station.



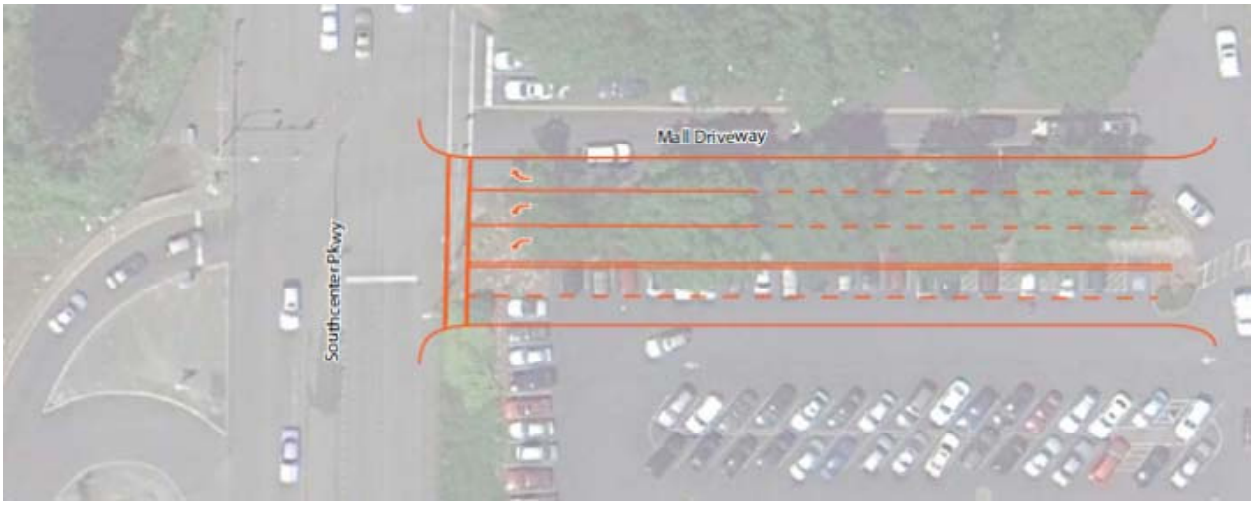
Project 1.16.C. I-5 Northbound Off-Ramp and Southcenter Parkway: Intersection Improvement

The signalized intersection of the I-5 northbound off-ramp and Southcenter Parkway is expected to be congested during the Saturday peak hour in 2030. Increased volumes on the north, south, and east approaches will result in increased traffic congestion. Vehicles from the east and west approaches to this intersection would experience the most delay.

- 2010 weekday level of service: LOS A (8 seconds of delay) in AM peak hour and LOS C (34 seconds of delay) in PM peak hour.
- 2010 midday and Saturday level of service: LOS C (24 seconds of delay) in midday peak hour and LOS D (42 seconds of delay) in Saturday peak hour.
- 2030 weekday level of service: LOS B (14 seconds of delay) in AM peak hour and LOS E (62 seconds of delay) in PM peak hour.
- 2030 midday and Saturday level of service: LOS C (24 seconds of delay) in midday peak hour and LOS F (123 seconds of delay) in Saturday peak hour.

Recommendation

Work with the Southcenter Mall owner to realign the mall driveway to be opposite the I-5 off-ramp while providing an additional westbound right turn lane. Further improvement could be made by adding a second eastbound left turn lane on the off-ramp; however, there is limited right-of-way and any improvements on this leg would require WSDOT concurrence and potentially would be a WSDOT project.



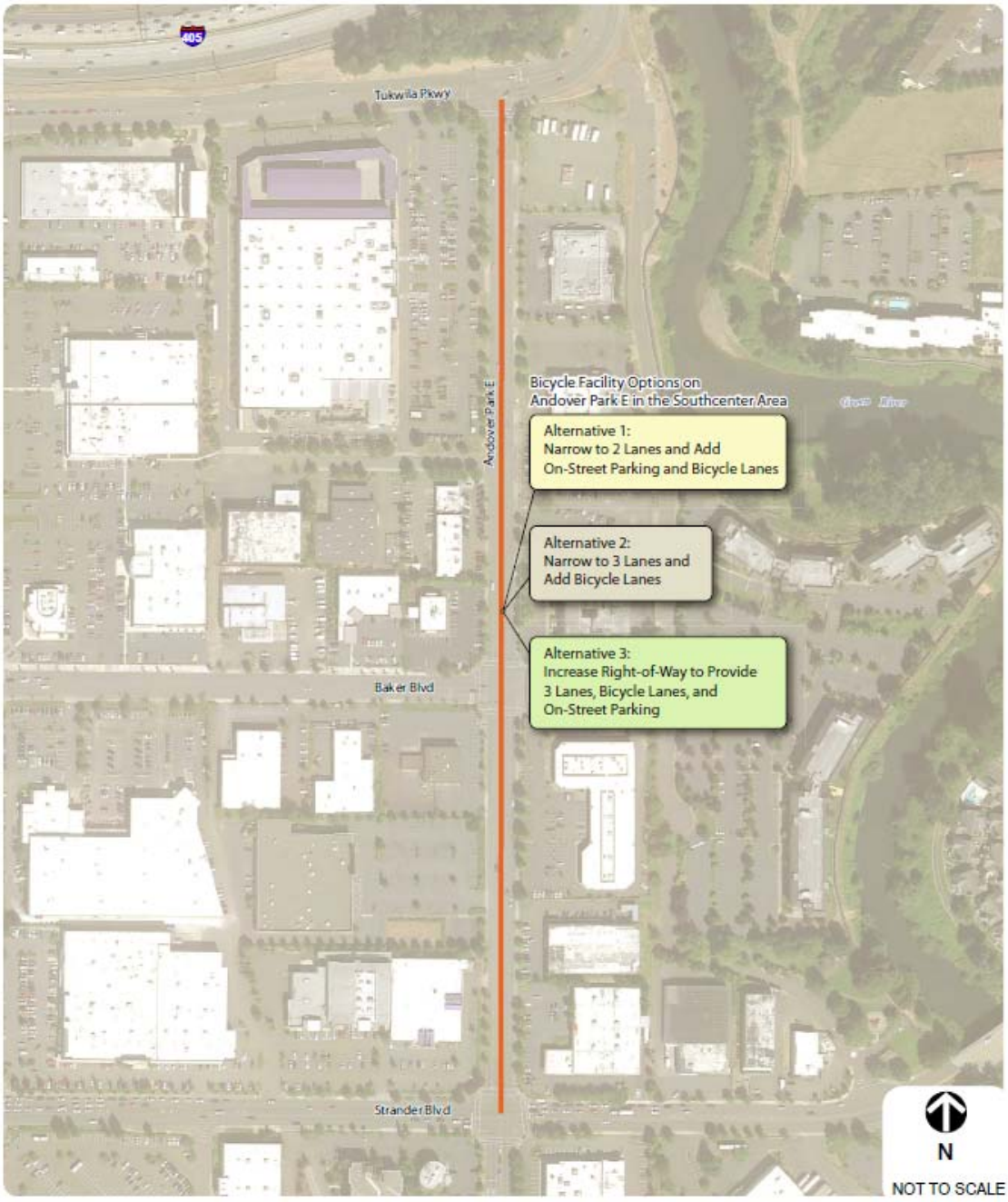
Aerial photo of the I-5 northbound off-ramp/Southcenter Parkway intersection

Project 1.17.A. Andover Park W from Strander Boulevard to Tukwila Parkway: Roadway Widening and Center Turn Lane Construction

This project, included in the TIP, will construct a center median with turn pockets and boulevard-type landscaping from Tukwila Parkway to Strander Boulevard. It will restrict driveway movements through access management and will widen corridor sidewalks. The project is expected to ease traffic congestion and increase access to businesses along Andover Park West. Construction is expected to be complete in 2013.

Project 1.18.A. Andover Park E from Strander Boulevard to Tukwila Parkway: Bicycle Facility Improvement

As noted in project 1.5.A, the levels of service for bicycles on the arterials in the Southcenter area are in the range of LOS D to F on many streets. To improve conditions for cyclists on Andover Park East, three alternatives were considered to add bicycle lanes between Tukwila Parkway and Strander Boulevard. The site area is shown below.



All three options reduce the current vehicle lanes from four lanes north of Baker Blvd and five lanes south of Baker Boulevard. Cross sections for each alternative are shown in order in the following graphic.

Alternative 1

Alternative 2

Alternative 3

Alternatives 1 and 2 can be constructed within the existing right-of-way. Alternative 1 would add on-street parking, but would not provide a center turning lane. The lack of this lane may lead to roadway congestion, especially during peak periods, due to the number of driveways that access Andover Park

East. The third alternative provides a turning lane, parking lanes, and a new wider sidewalk. However, the additional ROW required to accommodate all the lanes substantially increases the project costs.

Recommendation

Implement Alternative 2 in the near to mid-term. Establish development agreements to implement Alternative 3 as properties redevelop.

Project 1.19.B. Tukwila Parkway and 61st Avenue S: Intersection Improvement

The intersection of Southcenter Boulevard and 61st Avenue S is forecast to operate at LOS F during the Saturday peak hour in 2030. With the increase in employment and housing in the Southcenter area and Tukwila South, the traffic volumes through this intersection increase significantly when compared to existing conditions. The poor performance at this intersection is primarily the result of the backup of southbound traffic at the Tukwila Parkway/61st Avenue intersection. Due to the proximity of these intersections, they must be analyzed together.

- 2010 weekday level of service: LOS B (11 seconds of delay) in AM peak hour and LOS D (43 seconds of delay) in PM peak hour.
- 2010 midday and Saturday level of service: LOS D (48 seconds of delay) in midday peak hour and LOS D (49 seconds of delay) in Saturday peak hour.
- 2030 weekday level of service: LOS B (15 seconds of delay) in AM peak hour and LOS D (54 seconds of delay) in PM peak hour.
- 2030 midday and Saturday level of service: LOS E (58 seconds of delay) in midday peak hour and LOS F (more than 150 seconds of delay) in Saturday peak hour.

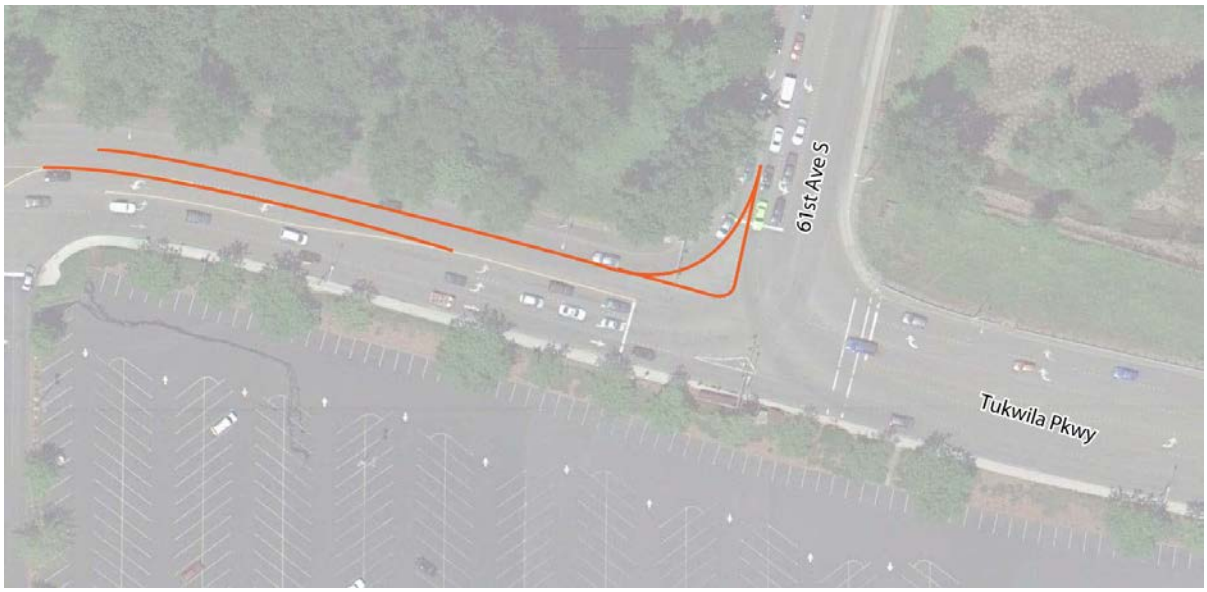
Recommendation

There are some long-term improvements that can be made along 61st Avenue S that would substantially improve traffic operations. However, these improvements are limited by the constrained capacity across I-405. Therefore, recommendation 1 below outlines a "mid-term" improvement that could be achieved without widening the bridge and recommendations 2 and 3 describe a longer-term solution.

> Change the lane configuration at the southbound approach to the Tukwila Parkway/61st Avenue S intersection to allow free right turns. This would require a minor change with the island and C-curbing to prevent any lane changes to turn into the mall entrance immediately west of 61st Avenue S.

This action would reduce overall intersection delay by about 30 seconds, although the overall delay would still exceed 150 seconds and the LOS would be F under Saturday peak hour conditions.

> Traffic operations could be further improved if the 61st Avenue Bridge was widened to include four southbound lanes, widening to five southbound lanes just after the bridge at the Tukwila Parkway intersection. The widening of the bridge would have to be accomplished as a part of the future I-405 widening, which would not occur prior to 2030. This option could also allow for reconfiguration to allow direct mall ingress/egress at this location. If this solution were provided under 2030 conditions, the Saturday peak hour LOS would be F. However, delay would be substantially less than the conditions without the bridge widening.



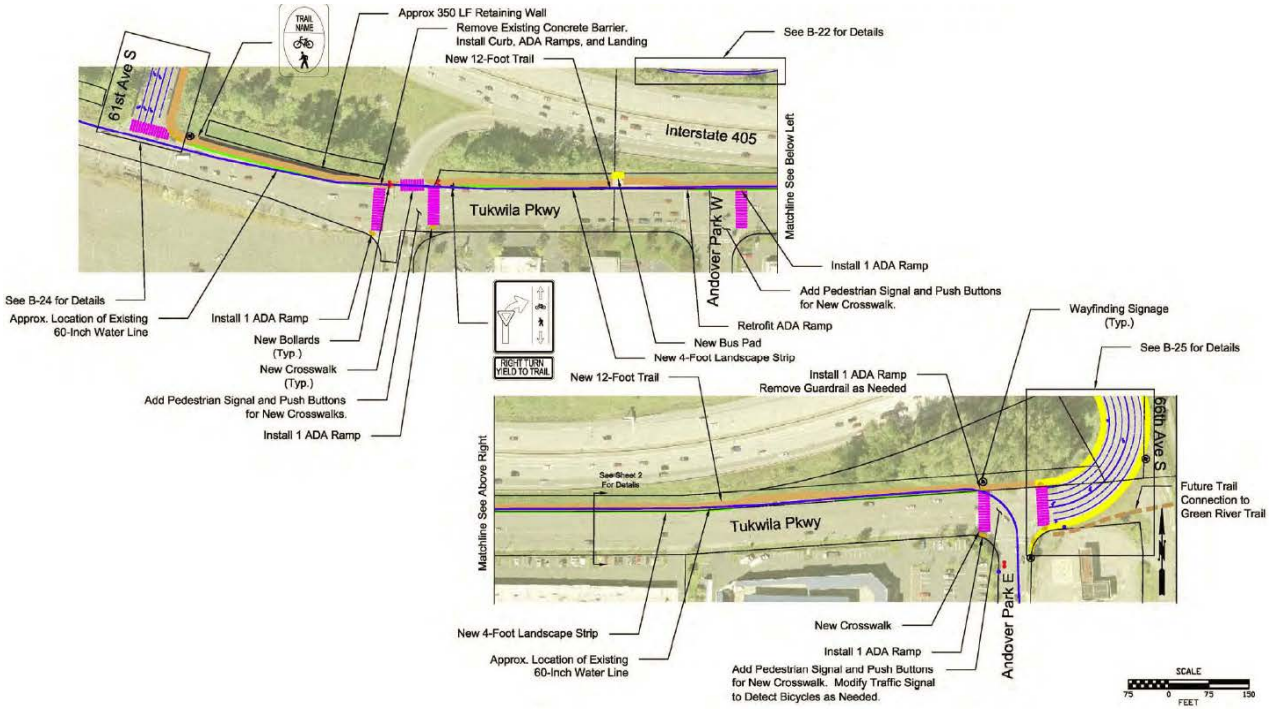
"Mid-term" improvement recommendation to address congestion at Southcenter Boulevard/61st Avenue S.

Project 1.20.C. Tukwila Parkway from 61st Avenue S to 66th Avenue S: Bicycle Facility Improvement

A 12' wide multi-use sidepath will be constructed on the north side of Tukwila Parkway between 61st Avenue S and 66th Avenue S. The side path would be separated from the street by a 4' landscape strip (except for at transit stops). There is no facility along the north side of the road today. In areas where existing transit stops are located, the stops may need to be placed behind (to the north of) the side path to maintain non-motorized access. Note that with the opening of the Tukwila Transit Center in September, 2013, the bus zone west of Andover Park West will be closed.

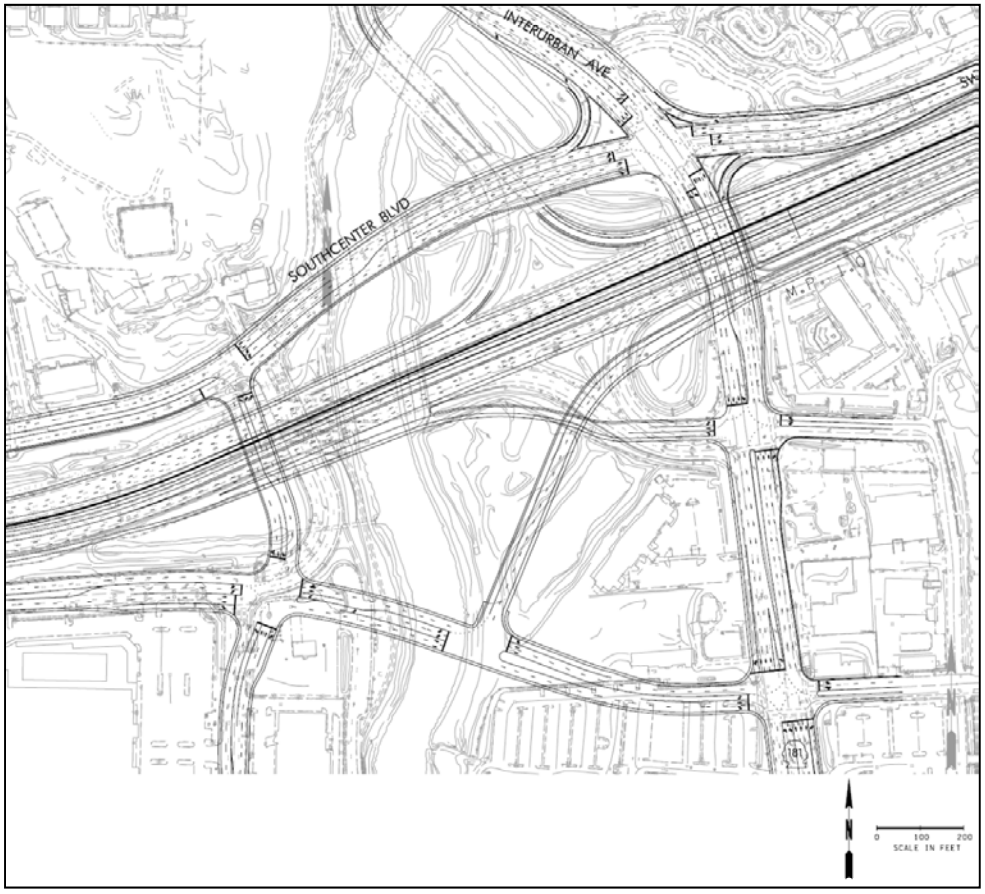
A crosswalk should be painted across the onramp to eastbound 1-405, and bollards should be placed on each side. In addition, crosswalks should be added across Tukwila Parkway at the Southcenter Mall driveway (across from the onramp to 1-405), at Andover Park West (east leg), and at Andover Park East (east and west legs).

The improvements can be made within the existing right-of-way. Some utilities on the north side of the road, including street lamps and signal poles, may need to be relocated. A 350' long (approximate) retaining wall will be needed between 61st Avenue S and the 1-405 onramp. Tukwila Parkway is planned to be extended to the east at the time the 1-405 widening project occurs. The design and construction of a trail or other non-motorized improvements to Tukwila Parkway will most likely occur at the time 1-405 is widened and Tukwila Parkway is extended to the east.



Project 1.21.C. Tukwila Parkway from 66th Avenue S to W Valley Highway: Roadway Extension

The extension of Tukwila Parkway from 66th Avenue S to West Valley Highway was originally proposed in the long range plan of the I-405 improvement project. The City adopted this project as a part of the Tukwila Urban Center Plan for the Southcenter area. To implement this project, the I-405 ramps would have to be realigned. Therefore, the extension of Tukwila Parkway would have to be carried out as a part of the future I-405 project. At this time, it is uncertain when this project would be implemented and how the costs would be shared amongst the City and WSDOT. This project would reduce traffic congestion at the Southcenter Boulevard and West Valley Highway intersection and provide an additional crossing over Green River to the Southcenter area from the east of the river. The following figure shows the design concept of Tukwila Parkway extension and relocated I-405 ramps.



Design concept for the Tukwila Parkway extension

Recommendation

Work with WSDOT to implement the extension of Tukwila Parkway as a part of the future I-405 improvements. This improvement should incorporate complete streets principles and at a minimum include sidewalks, bicycle lanes/multi-use trail, and a connection to the Green River trail. The design of the street should be consistent with the Urban Corridor standards defined in the Tukwila Urban Center Plan for the Southcenter area. In addition, the 68th Avenue bridge across I-405 should include wide sidewalks and bicycle lanes when reconstructed.

Project 1.22.C. Southcenter Boulevard and I-405 Southbound Off-Ramp: Intersection Improvement

The intersection of Southcenter Boulevard and the I-405 SB Off-ramp would operate at LOS F during the PM peak in 2030. This is an unsignalized intersection. The poor LOS can be attributed to the northbound to westbound left turn movement. The forecasted increase in demand for the eastbound movements on Southcenter Boulevard leads to fewer gaps for the northbound left movement resulting in increased delay.

- 2010 level of service: LOS A (7 seconds of delay) in AM peak hour and LOS D (29 seconds of delay) in PM peak hour.
- 2030 level of service: LOS C (23 seconds of delay) in AM peak hour and LOS F (more than 150 seconds of delay) in PM peak hour.

Since this intersection is operated by WSDOT, the City would need to work with WSDOT to reduce the PM peak period delays. The queues from this intersection would likely reach the I-405 mainline without a signal in 2030. Given that this solution primarily benefits WSDOT traffic operations, no City costs are assumed for this improvement.

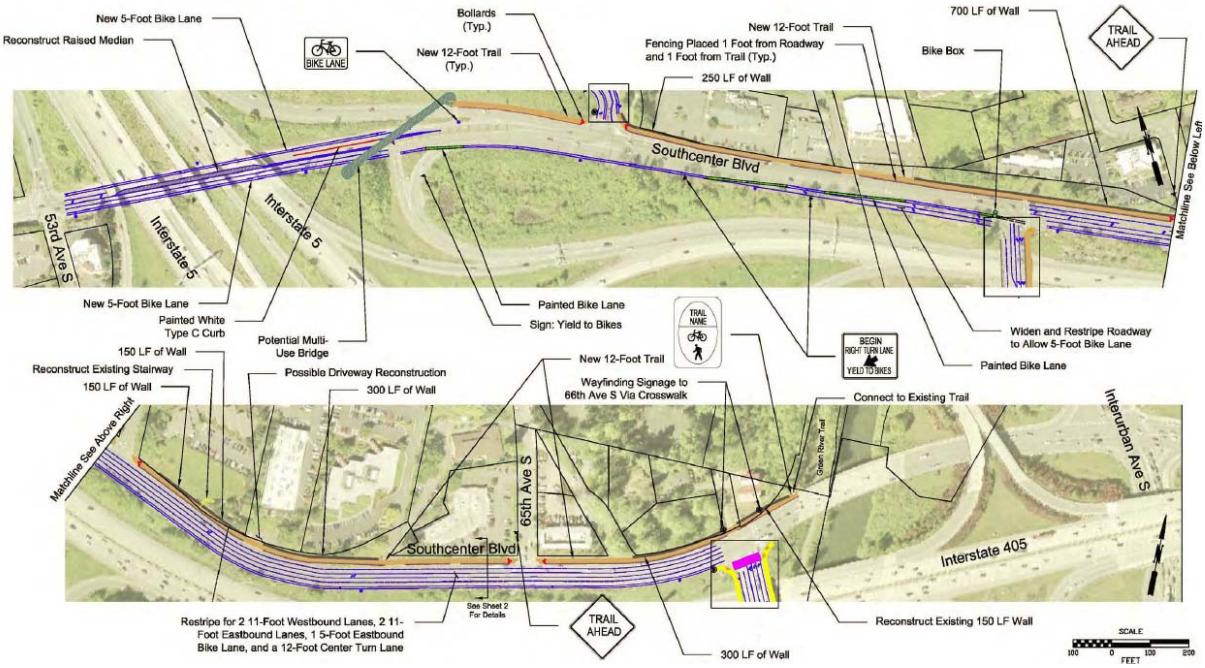
Recommendation

Request that WSDOT install a signal. This intersection would operate at LOS B with a signal in the PM peak hour in 2030.

Aerial photo of the existing conditions at the Southcenter Boulevard/I-405 Northbound Off-ramp

1.23.B. Southcenter Boulevard from 53rd Avenue S to 66th Avenue S: Bicycle Facility Improvement (Walk & Roll B22)

This project, from the Walk & Roll Plan, involves two design components. Along Southcenter Boulevard between 53rd Avenue S and the Macadam Road S, the road will be restriped to allow for five foot bike lanes along both sides of the road. The existing sidewalk on the north side of the street underneath the I-5 bridge will remain, and there will be no impacts to bridge abutments. East of Macadam Road S, to the bridge over the Green River, a 12 foot wide sidepath will be added along the north side of the road. The existing sidewalk could be widened for this facility. Future widening of I-405 will impact the design of non-motorized improvements to Southcenter Boulevard, as well as other routes providing access into the Southcenter area including the 61st Avenue S bridge, the 66th Avenue S bridge, and Tukwila Parkway. The design of non-motorized improvements along Southcenter Boulevard, the 61st Avenue S and 66th Avenue S bridges, and Tukwila Parkway will need to be carefully considered as part of the future I-405 widening project.



Project 1.24.A. Southcenter Boulevard from 61st Avenue S to 62nd Avenue S: Sidewalk and Crosswalk Improvement

Many sections along the south side of Southcenter Boulevard lack sidewalks. The lack of a sidewalk is reasonable along much of Southcenter Boulevard because there are no housing or commercial developments located on the south side of the street. However, to allow for better transit access on Southcenter Boulevard, it is recommended that a sidewalk be provided on the south side of the street between 61st Avenue S and 62nd Avenue S. A King County Metro bus stop is located between these streets. To avoid conflicts with vehicles turning left from Southcenter Boulevard to 62nd Avenue S, it is recommended that a new crosswalk also be installed on the east leg of this intersection.

Recommendation

- Add a sidewalk on the south side of Southcenter Boulevard between the 61st Avenue Bridge and 62nd Avenue S. Add a new crosswalk on the east leg of the intersection.
- Add a pedestrian refuge space in the median.
- Conduct a detailed traffic safety to determine whether the additional crosswalk can be safely provided.

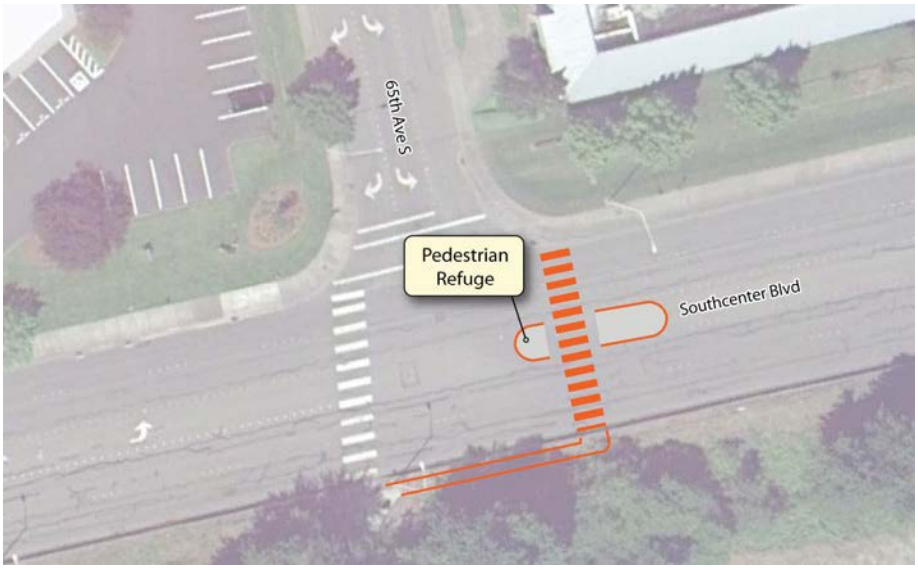
Recommended sidewalk improvements along Southcenter Boulevard near 62nd Avenue S.

Project 1.25.B. Southcenter Boulevard and 65th Avenue S: Sidewalk and Crosswalk Improvement

Similar to project 1.24.A, 65th Avenue S as well, a new crosswalk is recommended at 65th Avenue S on the east leg of the intersection. This crosswalk will allow pedestrians to take refuge in the painted median of Southcenter Boulevard without standing in the left turn lane. As part of this improvement, a new sidewalk on the south side of Southcenter Boulevard would need to be constructed between the new crosswalk and the existing King County Metro bus stop. This will require a retaining wall on the south side of Southcenter Boulevard.

Recommendation

- Add a crosswalk on the east leg of the Southcenter Boulevard/65th Avenue S intersection and construct a short segment of sidewalk to connect this crosswalk to the existing bus stop.
- Add a pedestrian refuge space in the median.
- Conduct a safety study before this project is implemented.



Recommended pedestrian improvements along Southcenter Boulevard near 65th Avenue S

Project 1.26.A. Southcenter Boulevard and 66th Avenue S: Intersection Improvement

The intersection of Southcenter Boulevard and 66th Avenue S is expected to operate at LOS F during the PM peak hour in 2030. The eastbound through movement and the westbound left movement experience the most delay as they conflict with one another.

- 2010 level of service: LOS B (15 seconds of delay) in AM peak hour and LOS D (47 seconds of delay) in PM peak hour.
- 2030 level of service with the existing geometry and signal operation: LOS B (18 seconds of delay) in AM peak hour and LOS F (121 seconds of delay) in PM peak hour.

It is possible to reduce the 2030 PM peak hour delay without widening this intersection. Changing the second westbound through lane into a left turn lane would provide additional capacity for the heavy left turning volumes and improve the intersection performance.

Recommendation

Modify the existing westbound approach lane configuration to one through lane and two left turn lanes. Note that this is a relatively minor improvement which the City could complete in the short-term.

Recommended improvements at the Southcenter Boulevard and 66th Avenue S intersection

Project 1.27.B. Southcenter Boulevard and W Valley Highway: Intersection Improvement

Due to shifts in traffic patterns predicted by the Tukwila travel demand forecast model, the traffic congestion at the Southcenter Boulevard and West Valley Highway intersection is expected to decrease slightly under 2030 conditions despite slightly higher overall volumes through the intersection. Even with the reduced delay (caused principally by a shift in traffic from left turn to through movements), the intersection would continue to operate at a poor level of service in 2030.

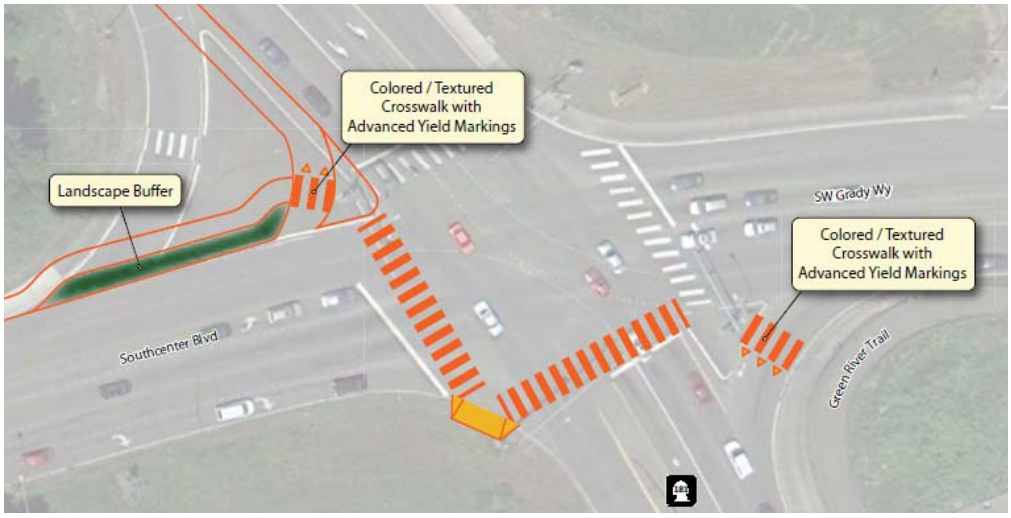
- 2010 level of service: LOS E (63 seconds of delay) in AM peak hour and LOS F (more than 150 seconds of delay) in PM peak hour.
- 2030 level of service: LOS D (42 seconds of delay) in AM peak hour and LOS F (112 seconds of delay) in PM peak hour.

This intersection has left and right turn lanes on all approaches and dual left turn lanes on the southbound approach. It would not be desirable to add traffic lanes to this intersection because the existing I-405 mainline and ramp overcrossings would limit the effectiveness of new lanes.

In addition to poor traffic operations at this location, the large footprint of the intersection combined with the large-radius right turns makes this area difficult to traverse on foot. While there are no practical improvements to traffic operations at this location without coordination with long-term WSDOT modifications to the I-405 corridor, several pedestrian improvements are recommended below.

Recommendation

1. Coordinate with WSDOT to modify the southbound channelized right turn lane by bringing traffic to the intersection or by reducing the corner radius of the lane.
2. Add high visibility crosswalks and advanced yield markings on the channelized right turn lanes to improve pedestrian visibility.
3. Provide additional pedestrian amenities (additional crosswalks, landscaped buffer) as shown below.



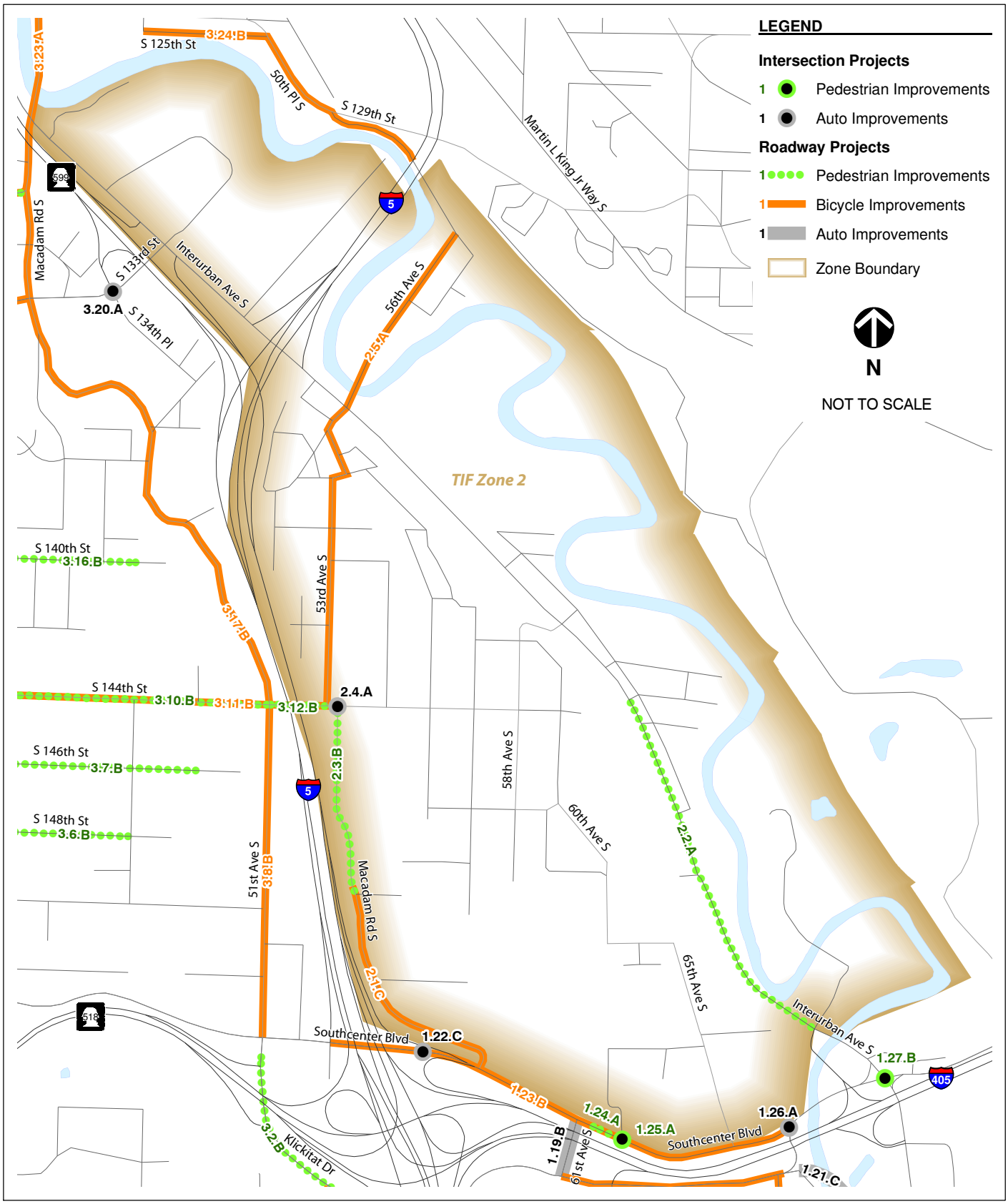
Recommended improvements at the Southcenter Boulevard/West Valley Highway intersection

TIF ZONE 2 RECOMMENDED TRANSPORTATION IMPROVEMENTS

This section provides details on the 2030 recommended transportation improvements that are located in Tukwila TIF Zone 2. As was the case for TIF Zone 1, **Table 23** lists the improvement measures based on the evaluation of existing and 2030 transportation operations, the City's 2012-2017 Transportation Improvement Program, and the Walk and Roll Plan. Estimated costs are also presented in the table and **Figure 34** shows the location of these projects.

TABLE 23 – RECOMMENDED TRANSPORTATION IMPROVEMENTS IN TIF ZONE 2

Project	Location	Improvement	Priority A-B Cost (Thousands)	Priority C Cost (Thousands)
2.1.C	Macadam Road S. from S 150th St to Southcenter Blvd	Bicycle lanes and widening		$3,871
2.2.A	Interurban Ave S from Fort Dent Way to S 143rd Street	Implement planned sidewalk and roadway improvements	$11,100	
2.3.B	Macadam Rd S from S 150th St to S 144th St	Add sidewalks	$405	
2.4.A	Macadam Rd S and S 144th Street	Intersection improvements to add a dedicated northbound left turn lane	$627	
2.5.A	53rd Ave S from S 144th to S 130th Pl	Widening, bike lanes, sharrows.	$1,190	
		TOTAL	$13,322	$3,871



FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig34_zone2.mxd

CITY OF TUKWILA - TIF ZONE 2 2030 PROJECTS

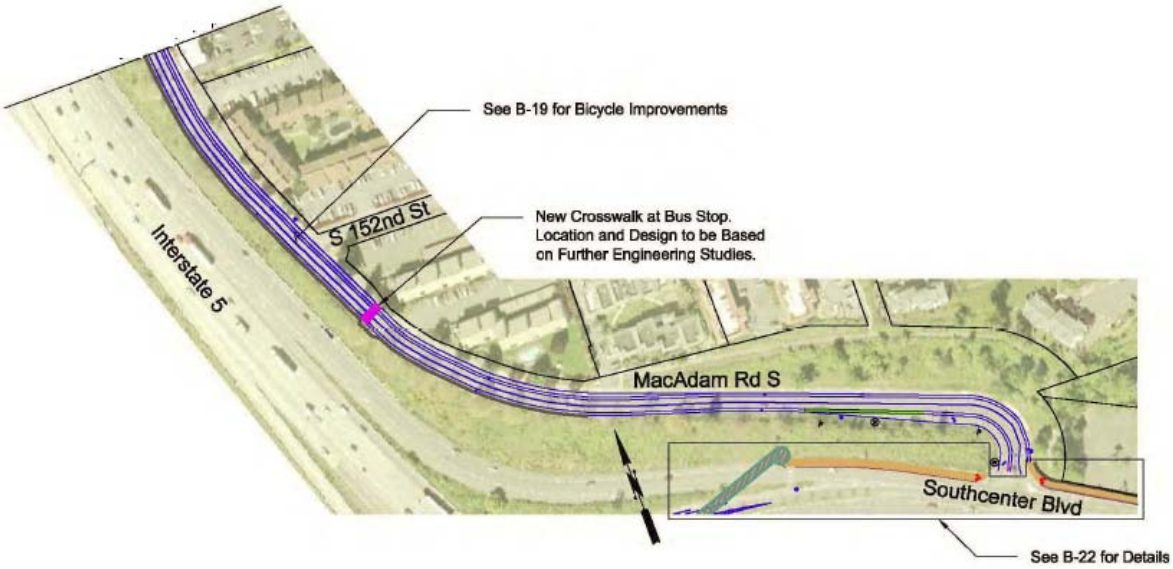
FIGURE 34

Recommended Improvements in TIF Zone 2

The following projects are based on the analysis of existing and 2030 transportation conditions.

Project 2.1.C. Macadam Road S from S 150th Street to Southcenter Boulevard: Pedestrian and Bicycle Facility Improvement (Walk & Roll B19)

This project would Widen Macadam Road S to allow for two 11-foot travel lanes, and five foot bike lanes in both directions. This would require a fill wall to be constructed along approximately 1,200 feet of the roadway. A seven foot parking lane along the east side of the road would be retained between S 150th Street and S 152nd Street to serve local uses. The improvements can be made within the existing right-of-way; however there may be some impacts to existing utilities along the east side of the road.

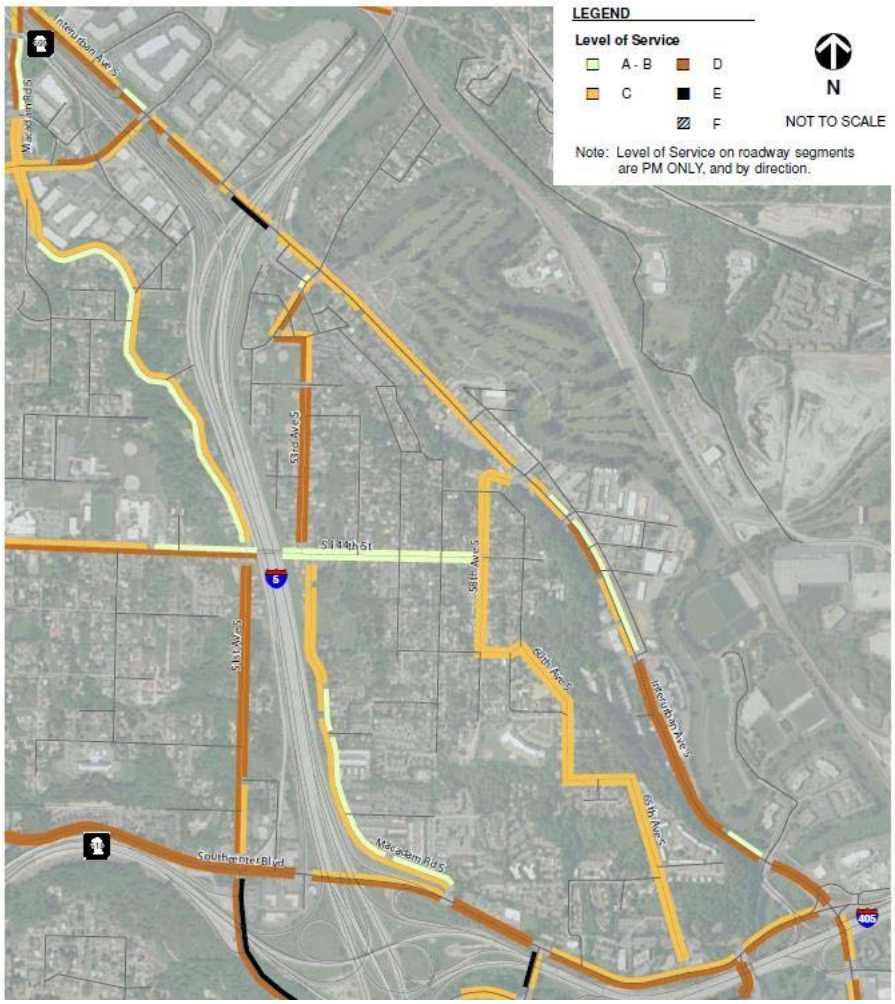


Project 2.2.A. Interurban Avenue S from Fort Dent Way to S 143rd Street: Roadway Reconstruction

Many sections of Interurban Avenue S operate at pedestrian LOS D, E or F because sidewalks are missing along large portions of the corridor, particularly on the west side of the street. The City completed 90 percent design to add sidewalks on both sides of Interurban Avenue S between Fort Dent Way and S 143rd Street. If implemented, this improvement would provide LOS A to C conditions along the entire east side of Interurban Avenue S between East Marginal Way and Southcenter Boulevard. North of the I-5 ramps there is less of a need to provide sidewalks on the west side of Interurban Avenue S because there are no homes or businesses on that side of the street.

Recommendation

Construct sidewalks between Fort Dent Way and 143rd Street per the TIP.



Project 2.3.B. Macadam Road S from S 150th Street to S 144th Street: Sidewalk Improvement (Walk & Roll P10)

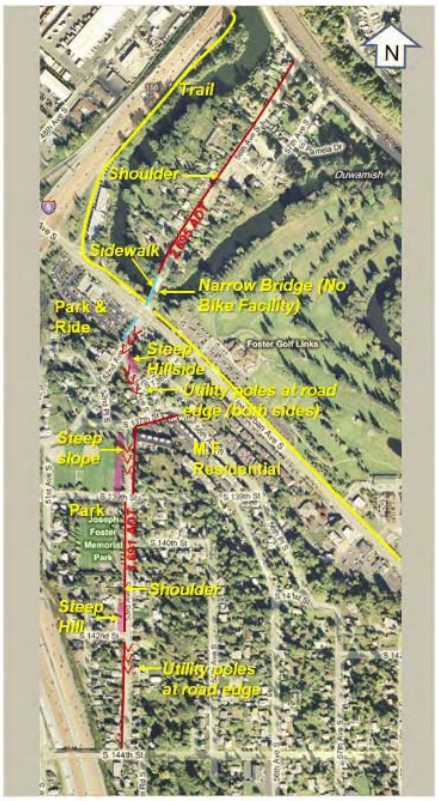
Macadam Road will be widened to the west to allow for two 11 foot travel lanes, and five foot bike lanes in both directions. A five foot wide sidewalk will be constructed on the east side of the road from south of S 144th Street to S 150th Street. Pedestrian crosswalks should be added across Macadam Road S to connect to transit stops on the west side of the road at two locations, including one crossing between S 150th Street and S 152nd Street, and another south of S 152nd Street.

Project 2.4.A. Macadam Road S and S 144th Street: Intersection Improvement

This project, from the Tukwila TIP, would improve the intersection at Macadam Road/S 144th Street by widening Macadam Road at the intersection to allow for a dedicated northbound left turn lane.

Project 2.5.A. 53rd Ave S from S 144th Street to S 130th Place: Roadway Widening and Bicycle Facility Improvement (B17)

This project, from the Walk & Roll Plan, involves several components. On 53rd Avenue S, between S 144th Street and S 137th Street, the road will be widened and restriped to provide a five foot bike lane in each direction. In addition, five foot wide sidewalks will be built on each side, and new crosswalks will be installed across 53rd Avenue S at S 144th Street, S 139th Street, and S 137th Street.



Along S 137th Street, the road will be widened and restriped to provide a five foot wide bike lane in both the eastbound and westbound directions between 52nd Avenue S and 53rd Avenue S. A new five foot wide sidewalk will be constructed on the south side of the street.

North of S 137th Street, both 52nd Avenue S and 53rd Avenue S will be reconfigured as a one-way couplet. 53rd Avenue S between S 137th Street and 52nd Avenue S will be widened both to the east and west and restriped to provide one 11 foot wide northbound travel lane and a five foot wide bike lane. A new five foot wide sidewalk will be constructed on the east side of the road.

52nd Avenue S between S 137th Street and 53rd Avenue S will be widened both to the east and west and restriped to provide one 11 foot wide southbound travel lane and a five foot wide bike lane. A new five foot wide sidewalk will be constructed on the west side of the road.

On 52nd Avenue S, from 53rd Avenue S to Interurban Avenue S, sharrows will be installed in both directions. This portion of the road is relatively short in length, has turn lanes and is adjacent to the park and ride lot.

TIF ZONE 3 RECOMMENDED TRANSPORTATION IMPROVEMENTS

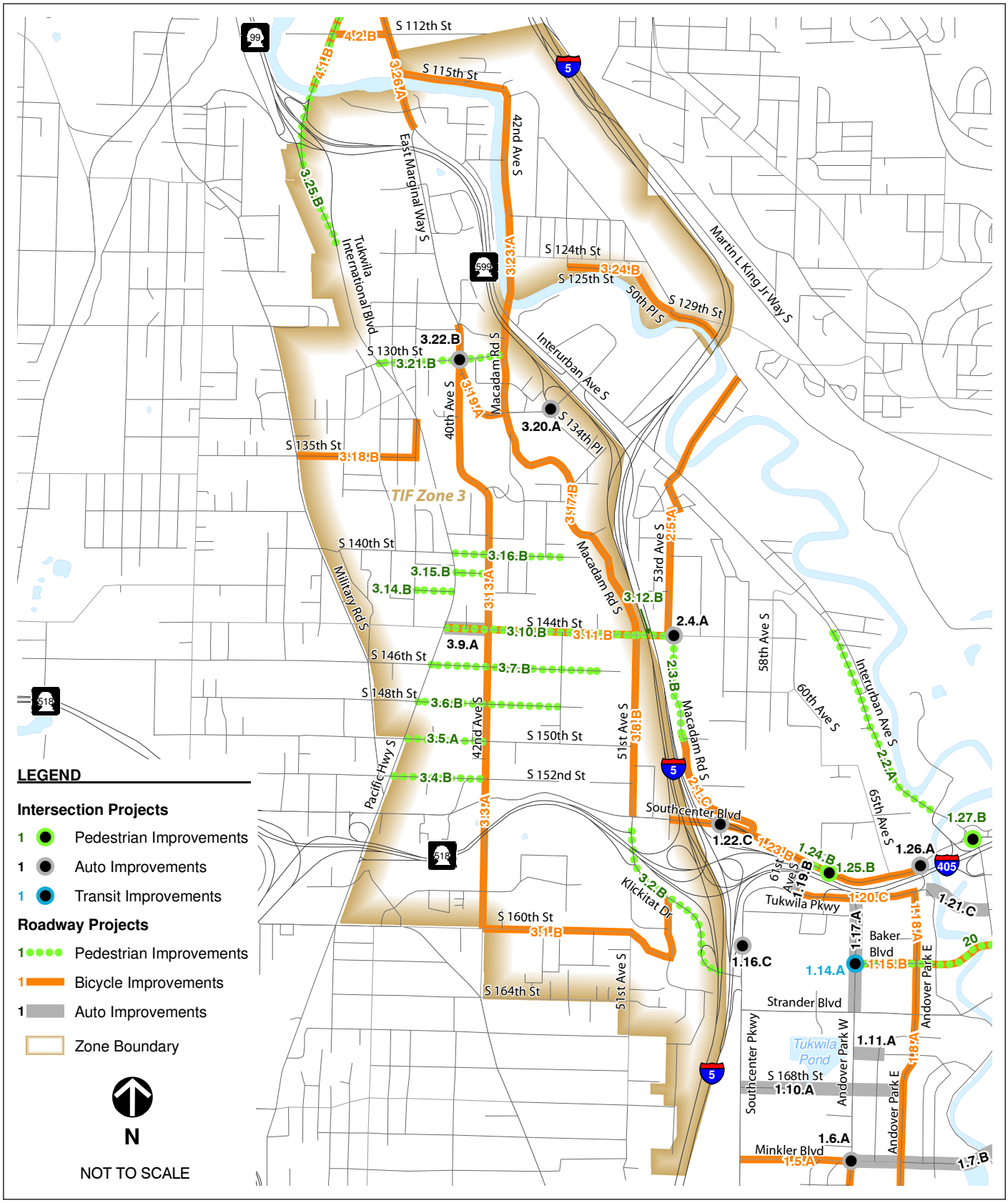
This section provides details on the 2030 recommended transportation improvements that are located in TIF Zone 3. **Table 24** lists the improvement measures based on the evaluation of existing and 2030 transportation operations, the City's 2012-2017 Transportation Improvement Program, and the Walk and Roll Plan. Estimated costs are also presented in the table and **Figure 35** shows the location of these projects.

TABLE 24 – RECOMMENDED TRANSPORTATION IMPROVEMENTS IN TIF ZONE 3

Project	Location	Improvement	Priority A-B Cost (Thousands)	Priority C Cost (Thousands)
3.1.B	S 160th St / 53rd Ave S from 42nd Ave S to Klickitat Dr	Sharrows and widening	$2,654	
3.2.B	Klickitat Dr from 53rd Ave S to Southcenter Blvd bridge	Extend multi-use trail	$1,686	
3.3.A	42nd Ave S from S 144th St to S 160th St	Bicycle boulevard	$161	
3.4.B	S 152nd St from Tukwila International Blvd to 42nd Ave S	Add sidewalks	$1,605	
3.5.A	S 150th St from Tukwila International Blvd to 42nd Ave S	Add sidewalks	$2,603	
3.6.B	S 148th St from Tukwila International Blvd to 46th Ave S	Add sidewalks	$3,117	
3.7.B	S 146th St from Tukwila International Blvd to 47th Ave. S	Add sidewalks	$3,756	
3.8.B	51st Ave S from S 144th St to Southcenter Pkwy	Widening and sharrows	$1,823	
3.9.A	S 144th St	Multimodal roadway improvements	$1,825	
3.10.B	S 144th St from 42nd Ave S to 51st Ave S	Sidewalks on south side	$2,102	
3.11.B	144th St S from Tukwila International Blvd to Macadam Rd S	Bicycle lanes	$26	
3.12.B	S 144th St at I-5	Preliminary engineering for new sidewalks across I-5	$100	
3.13.A	40th Ave S / 42nd Ave S from S 128th St to S 144th St	Bicycle lanes and sidewalks	$1,696	
3.14.B	S 142nd St from Tukwila International Blvd to 37th Ave S	Add sidewalks	$1,282	
3.15.B	S 141st St from Tukwila International Blvd to 42nd Ave S	Add sidewalks	$93	
3.16.B	S 140th St from Tukwila International Blvd to 46th Ave S	Add sidewalks	$3,952	
3.17.B	Macadam Rd S from S 133rd St to S 144th St	Bicycle sharrows	$134	
3.18.B	S 135th St/37th Ave S from Military Rd S to Tukwila International Blvd	Signage and bicycle lanes	$508	
3.19.A	E Marginal Way from S 103th St to Macadam Rd S	Bicycle lanes	$35	
3.20.A	S 133rd St/SR 599 Ramps	Intersection improvements	$190	

TABLE 24 – RECOMMENDED TRANSPORTATION IMPROVEMENTS IN TIF ZONE 3

3.21.B	S 130th Street from Tukwila International Boulevard to Macadam Road S	Roadway Widening and Bicycle Facility Improvement	$4,244	
3.22.B	E Marginal Way / 40th Ave S & S 130th St	Re-align 40th Ave. S and create a new unsignalized intersection	$163	
3.23.A	S 115th St/42nd Ave S from E Marginal Way to S 133rd St	Sharrows and signage	$45	
3.24.B	S 125th St/50th Pl S from 46th Ave S to east city limits	Bicycle route signage and landscaping	$677	
3.25.B	Tukwila International Blvd from Green River Bridge to 13400 Block Signal	Sidewalks added south of bridge	$2,040	
3.26.A	East Marginal Way from Boeing Access Rd to Interurban Ave S	Wide shoulder and bicycle lanes	$35	
		TOTAL	$36,552	$0



FEHR PEERS

\\Fpse03\fpse2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig35_zone3.mxd

CITY OF TUKWILA - TIF ZONE 3 2030 PROJECTS

FIGURE 35

Recommended Improvements in TIF Zone 3

The following projects are based on the analysis of existing and 2030 transportation conditions.

Project 3.1.B. S 160th Street and 53rd Avenue S from 42nd Avenue S to Klickitat Drive: Bicycle Facility Improvement (Walk & Roll B21)

This project involves two design components. Along S 160th Street, sharrows will be installed in both directions. Along 53rd Avenue S, between S 159th Street and S 160th Street, the roadway will be widened to add a five foot climbing bike lane southbound (uphill) and a five foot sidewalk on the west side of the street. Sharrows will be added to the northbound lane (downhill) for this segment.

Between Klickitat Drive and S 159th Street on 53rd Avenue S, a new five foot sidewalk will be constructed on the east side. Sharrows will be installed in both directions.

Project 3.2.B. Klickitat Drive from 53rd Avenue S to Southcenter Parkway: Walkway Improvement

The pedestrians on Klickitat Drive between the Southcenter Boulevard bridge and Southcenter Parkway experience LOS D to F conditions. Traffic volumes are high along the corridor and sidewalks are not provided. However, an off-road trail is provided along Klickitat Drive south of 53rd Avenue S to the bridge over I-5 on the southwest side of this road.

Note that this project is within WSDOT's limited access area. Project does not include widening of the 51st Avenue S bridge.

Recommendation

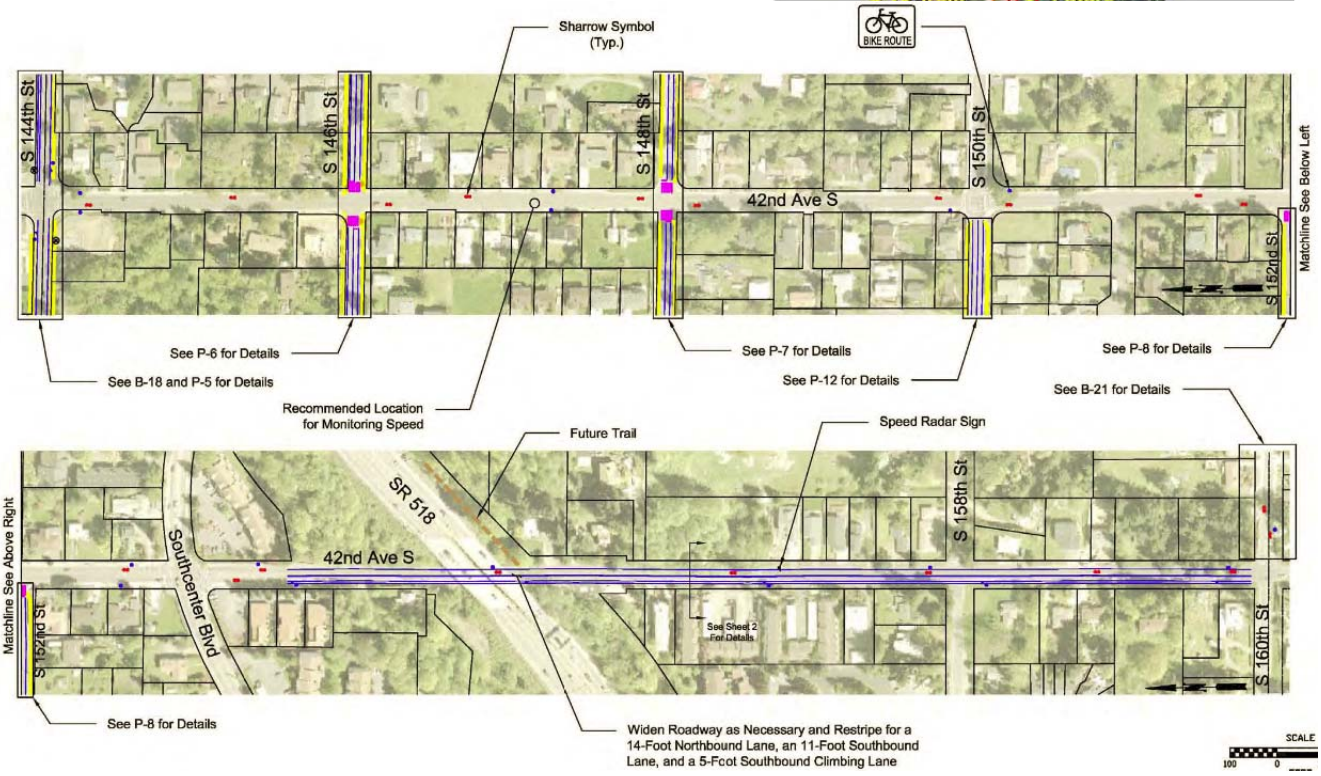
1. Extend the multi-use trail from 53rd Avenue S to the 51st Avenue S bridge, where there are existing (although very narrow) sidewalks. This trail should be placed along the north/east of the street with a new crossing at 53rd Avenue S.
2. Enhance the existing multi-use trail with pedestrian scale lighting and a shorter fence between the trail and Klickitat Drive. This improvement could be completed as part of a rehabilitation project of the existing walkway when it reaches the end of its useful life.
3. Work with WSDOT to widen the existing SR 518 overpass to accommodate the multi-use trail on the east side of the structure.

Recommended pedestrian improvements along Klickitat Drive.

Project 3.3.A. 42nd Avenue S from S 144th Street to S 160th Street: Bicycle Boulevard Addition (Walk & Roll B14)

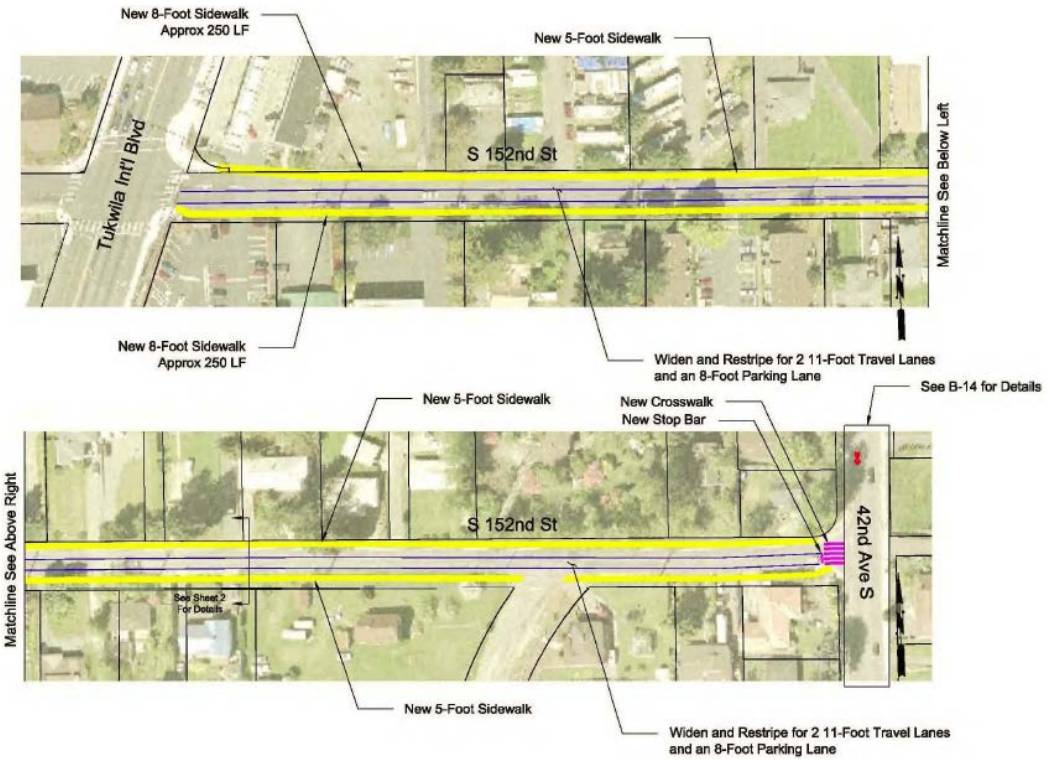
This project involves two design components. The road will be designed as a "bicycle boulevard" to improve bicycle movements and reduce vehicular movement and speeds. On 42nd Avenue S between S 144th Street and S 154th Street (Southcenter Boulevard), sharrows will be installed in both directions.

South of S 154th Street, the road will be restriped for a 14 foot northbound lane with sharrows and an 11 foot lane in the southbound direction.



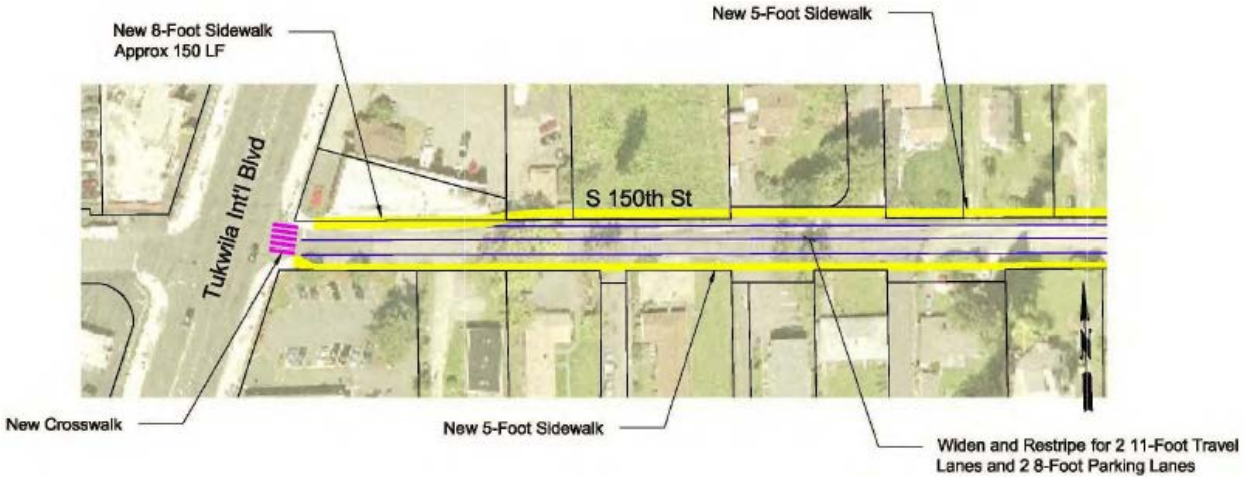
Project 3.4.B. S 152nd Street from Tukwila International Boulevard to 42nd Avenue S: Sidewalk Improvement (Walk & Roll P8)

S 152nd Street between Tukwila International Boulevard and 42nd Avenue S will be widened and restriped to allow two eleven foot travel lanes (one in each direction), and a new five foot wide sidewalk along each side of the road. However, an eight foot wide sidewalk is recommended for 250 feet on both sides of the road adjacent to parcels immediately east of Tukwila International Boulevard, because of the higher density land uses anticipated to occur at this location. A crosswalk would be installed at the intersection with 42nd Ave S.



Project 3.5.A. S 150th Street from Tukwila International Boulevard to 42nd Avenue S: Sidewalk Improvement (Walk & Roll P12)

S 150th Street between Tukwila International Boulevard and 42nd Avenue S will be widened and restriped to allow two eleven foot travel lanes (one in each direction), an eight foot wide parking lane on each side, and a new five foot wide sidewalk along each side of the road. A new crosswalk would need to be installed at the intersection with Tukwila International Boulevard.

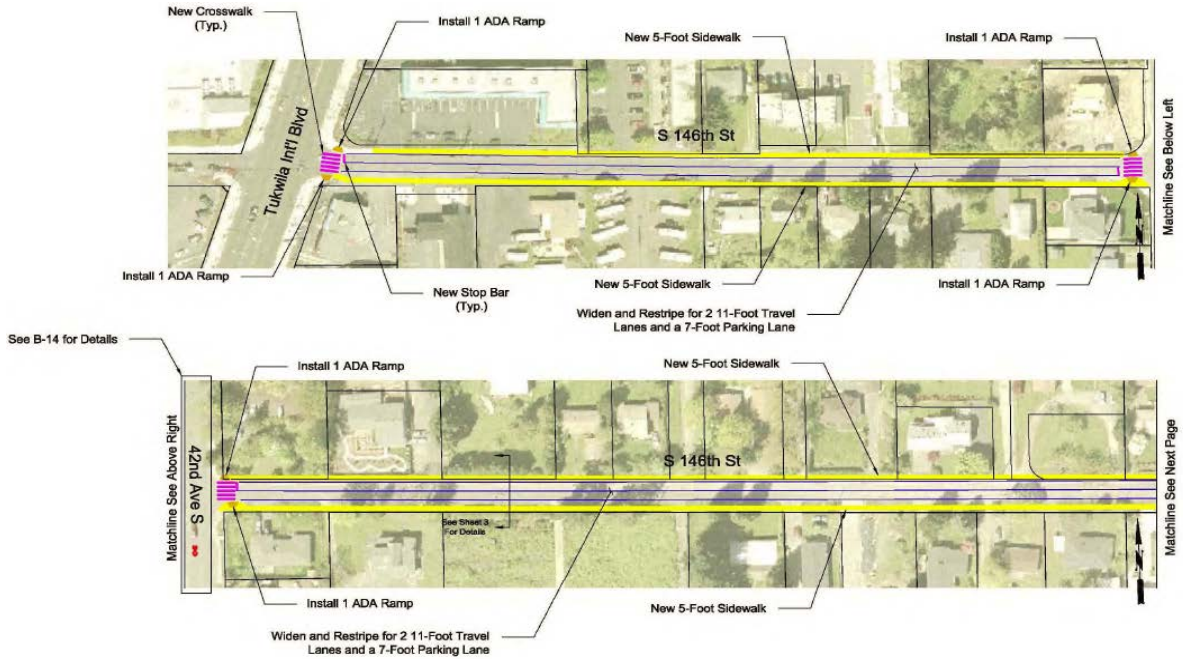


Project 3.6.B. S 148th Street from Tukwila International Boulevard to 46th Avenue S: Sidewalk Improvement (Walk & Roll P7)

S 148th Street between Tukwila International Boulevard and 46th Avenue S will be widened and restriped to provide two eleven foot travel lanes, an eight foot wide parking lane on the south side, and a five foot wide sidewalk on both sides of the street. Crosswalks across S 148th Street, and bulbouts with curb ramps would be included at the intersections with Tukwila International Boulevard, 42nd Avenue S, and 46th Avenue S.

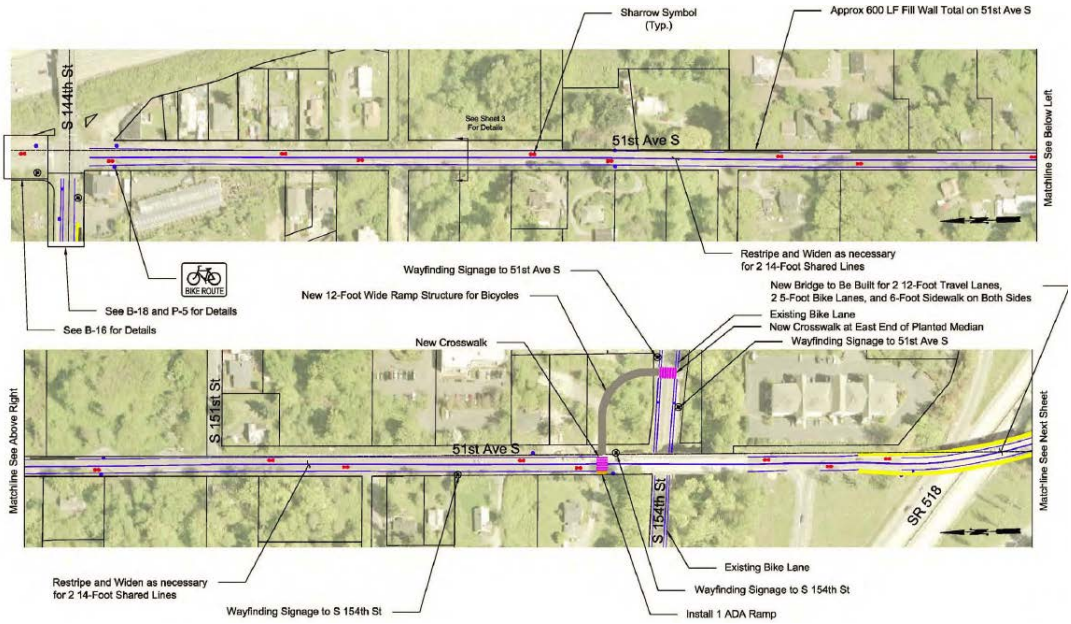
Project 3.7.B. S 146th Street from Tukwila International Boulevard to 47th Avenue S: Sidewalk Improvement (Walk & Roll P6)

S 146th Street between Tukwila International Boulevard and 47th Avenue S will be widened and restriped to provide two eleven foot travel lanes, a seven foot wide parking lane on the south side, and five foot sidewalks on both sides of the road. Crosswalks across S 146th Street, and bulbouts with curb ramps would be included at the intersections with Tukwila International Boulevard, 42nd Avenue S, and 46th Avenue S.



Project 3.8.B. 51st Ave S from S 144th Street to Southcenter Parkway: Bicycle Facility Improvement (Walk & Roll B20 Northern Portion)

Between S 144th Street and SR 518, the road will be restriped and widened as needed to allow for two 14 foot travel lanes. Sharrows will be installed in both directions. A ramp is proposed along the east side of 51st Avenue S to connect the bike lanes along S 154th Street to 51st Avenue S. Crosswalks should be painted across both 51st Avenue S, and S 154th Street. Construction will likely require fill walls due to slopes.

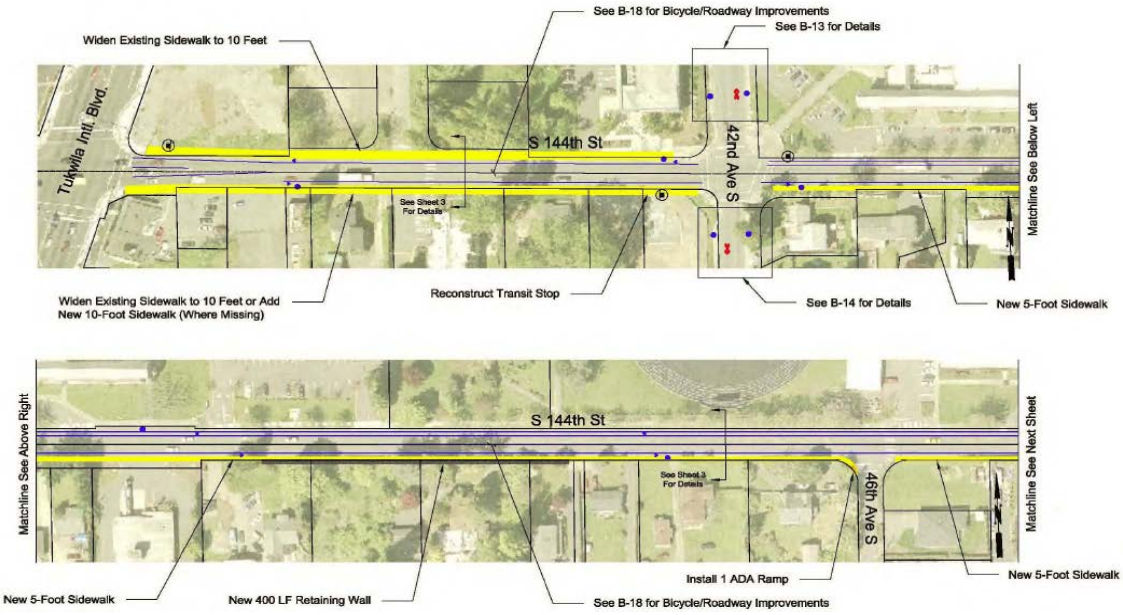


Project 3.9.A. S 144th Street from 42nd Avenue S to Tukwila International Boulevard: Multimodal Improvements

This project would improve bicycle and pedestrian amenities from 42nd Avenue S to Tukwila International Boulevard and would include design and construction of new pavement, curb, gutter, sidewalks bike lanes, drainage, illumination, and utility undergrounding.

Project 3.10.B. S 144th Street from 42nd Avenue S to 51st Avenue S: Sidewalk Improvement (Walk & Roll P5)

S 144th Street between 42nd Avenue S and 51st Avenue S will be widened and restriped to allow for two eleven foot travel lanes and a five foot bike lane on each side of the road. A new five and a half foot wide sidewalk (including curb) would be constructed on the south side of the road between 42nd Avenue S and just west of the existing sidewalk at 51st Avenue S.



Project 3.11.B. S 144th Street from 42nd Ave S to Macadam Road S: Bicycle Facility Improvement (Walk & Roll B18)

S 144th Street between 42nd Avenue S and Macadam Road S will be restriped to allow for two eleven foot travel lanes and a five foot bike lane on each side of the road.

Project 3.12.B. S 144th Street Bridge over I-5: Preliminary Engineering for Sidewalks

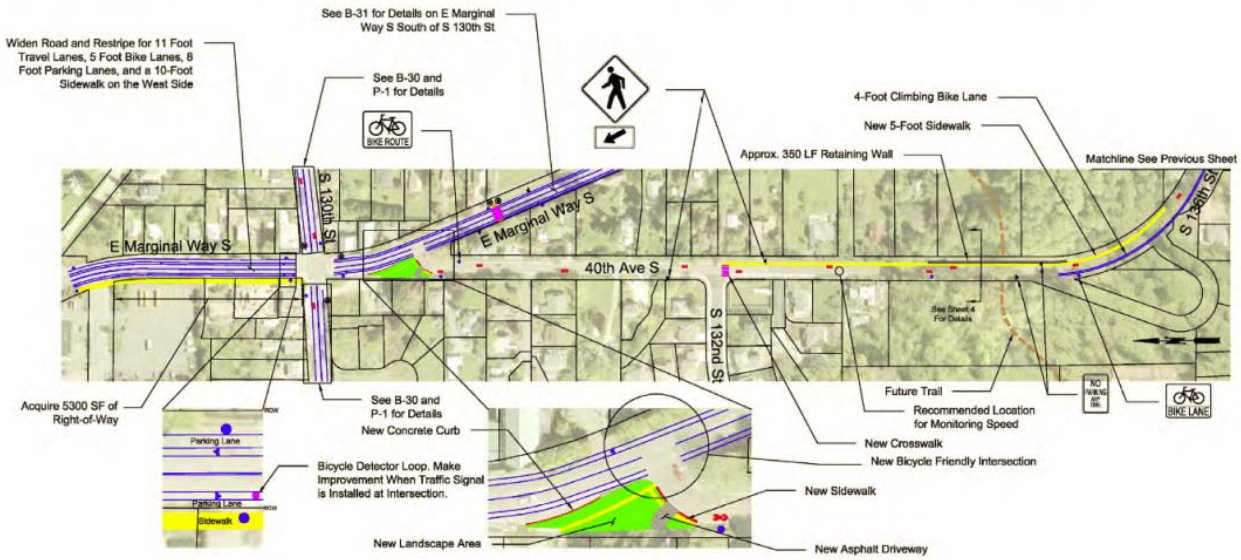
This project would conduct preliminary engineering for new sidewalks across the S 144th Street/I-5 bridge. This improvement will ultimately improve the pedestrian environment in this part of Tukwila and provide a high-quality pedestrian crossing of I-5. This project in within WSDOT's limited access right-of-way.

Project 3.13.A. 40th Avenue S and 42nd Avenue S from S 128th Street to S 144th Street: Pedestrian and Bicycle Facility Improvement (Walk & Roll B13)

This project involves several design components. On E Marginal Way S (north of S 130th Street), the roadway will be widened as redevelopment occurs to allow two 11-travel lanes, five foot bike lanes on both sides, and eight foot parking lanes on both sides.

On 40th Avenue S, the road will be designed as a "bicycle boulevard" to improve bicycle movements and reduce vehicular movement and speeds. A five foot wide sidewalk will be installed on the east side of the road where there are currently gaps.

At S 136th Street, a four foot climbing lane for bicyclists will be installed in the southbound direction, while a sharrow is installed for the northbound direction. On 42nd Avenue S, sharrows would be installed in both directions. The section of 42nd Avenue S north of S 139th Street should be restriped for 12 foot lanes in both directions.



Project 3.14.B. S 142nd Street from Tukwila International Boulevard to 37th Avenue S: Sidewalk Improvement (Walk & Roll P4)

S 142nd Street between 37th Avenue S and Tukwila International Boulevard will be widened and restriped to allow two eleven foot travel lanes (one in each direction), a seven and a half foot wide parking lane on each side of the road and a new five foot wide sidewalk along each side of the road. Crosswalks across S 142nd Street, and bulbouts with curb ramps would be included at the intersections with 37th Avenue S, and Tukwila International Boulevard.

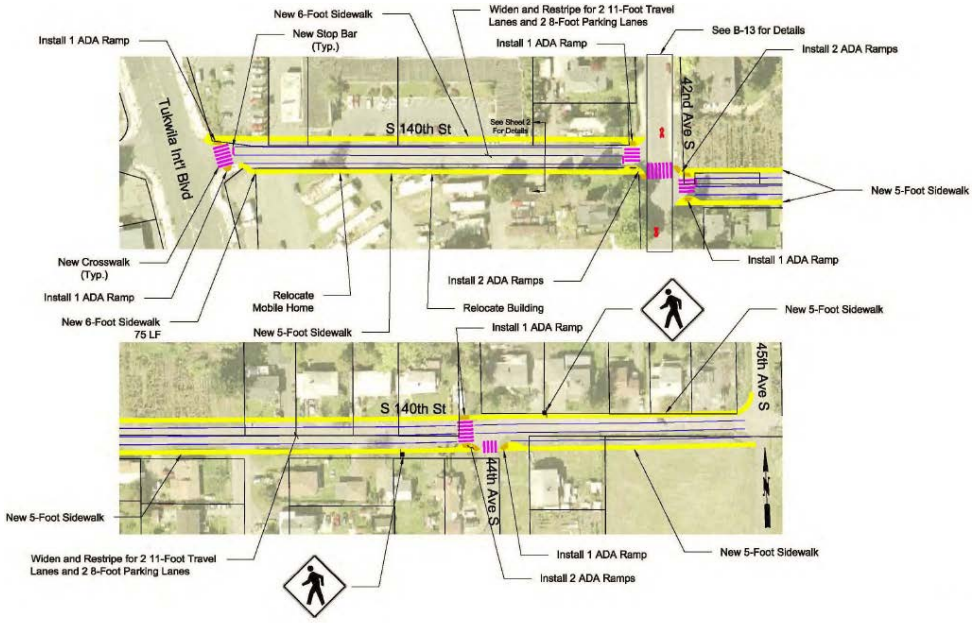
Project 3.15.B. S 141st Street from Tukwila International Boulevard to 42nd Avenue S: Sidewalk Improvement (Walk & Roll P3)

This project would add a 6 foot sidewalk on the south side of S 141st Street between Tukwila International Boulevard and 42nd Avenue S.

Project 3.16.B. S 140th Street from Tukwila International Boulevard to 46th Avenue S: Sidewalk Improvement (Walk & Roll P2)

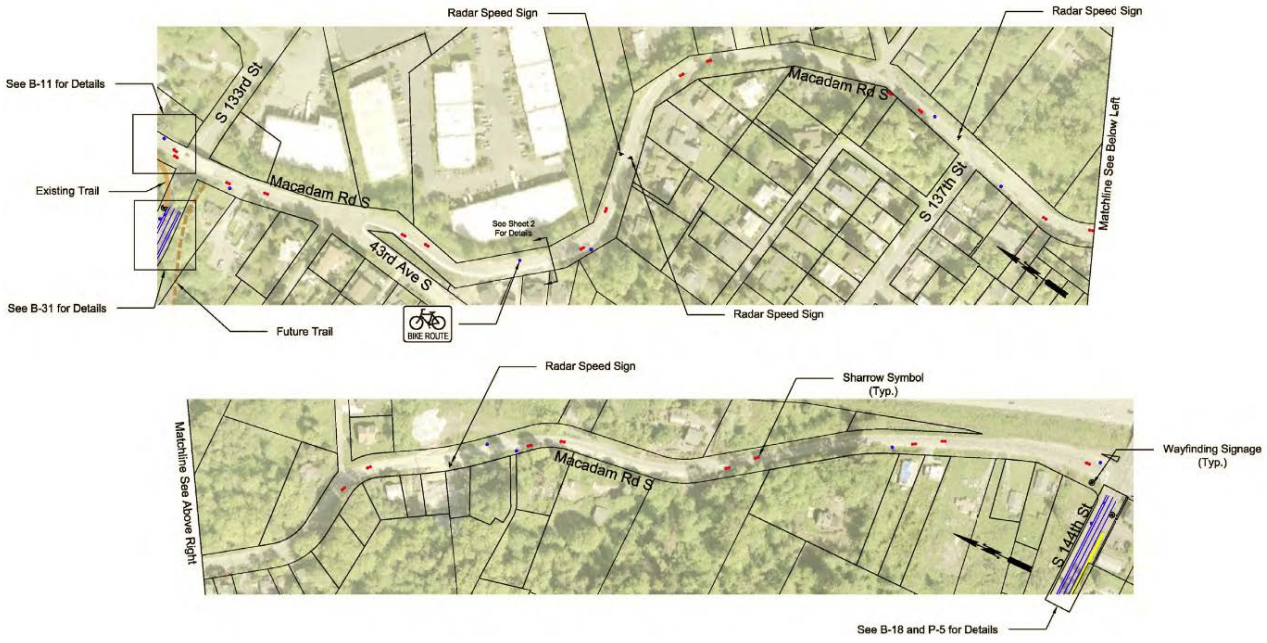
This project includes two components. S 140th Street between Tukwila International Boulevard and 42nd Avenue S will be widened and restriped to allow two eleven foot travel lanes, two eight foot parking lanes, and a six foot wide sidewalk along each side of the road.

S 140th Street between 42nd Avenue S and 44th Avenue S will be widened and restriped to allow two eleven foot travel lanes, two eight foot parking lanes, and a five foot wide sidewalk along each side of the road. Crosswalks across S 140th Street and curb ramps would be included at the intersections with 42nd Avenue S and 44th Avenue S.



Project 3.17.B. Macadam Road S from S 133rd Street to S 144th Street: Bicycle Facility Improvement (Walk & Roll B16)

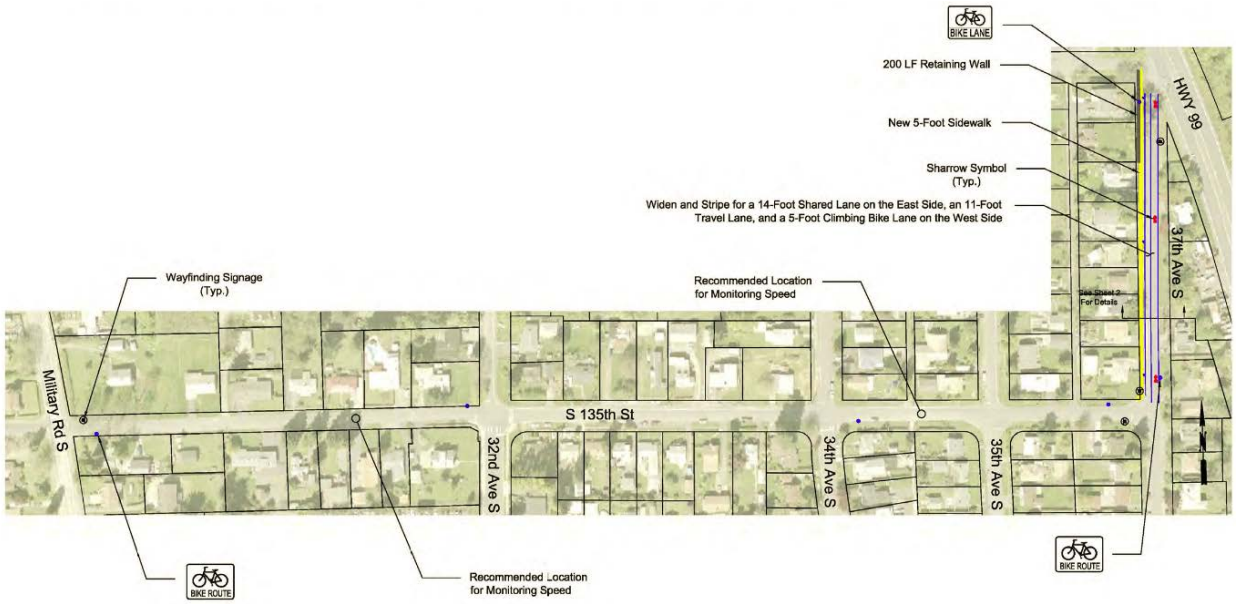
Macadam Road S would be improved for bicyclists by adding sharrow markings along the entire roadway between S 133rd Street and S 144th Street.



Project 3.18.B. S 135th Street and 37th Avenue S from Military Road S to Tukwila International Boulevard: Bicycle Facility Improvement (Walk & Roll B12)

This project involves two design components. On S 135th Street, between Military Road S and 37th Avenue S, a bike boulevard would be constructed. Improvements should be limited to bike route/bike boulevard signage.

On 37th Avenue S, between Tukwila International Boulevard and S 135th Street, the road will be restriped to provide a 14 foot shared lane (northbound), 11 foot travel lane (southbound), and five foot bike lane (southbound) for climbing the hill. A sharrow would be installed in the shared northbound lane. In addition, a new five foot wide sidewalk would be constructed on the west side of the road.



Project 3.19.A. E Marginal Way from S 130th Street to Macadam Road S: Bicycle Facility Improvement (Walk & Roll B31)

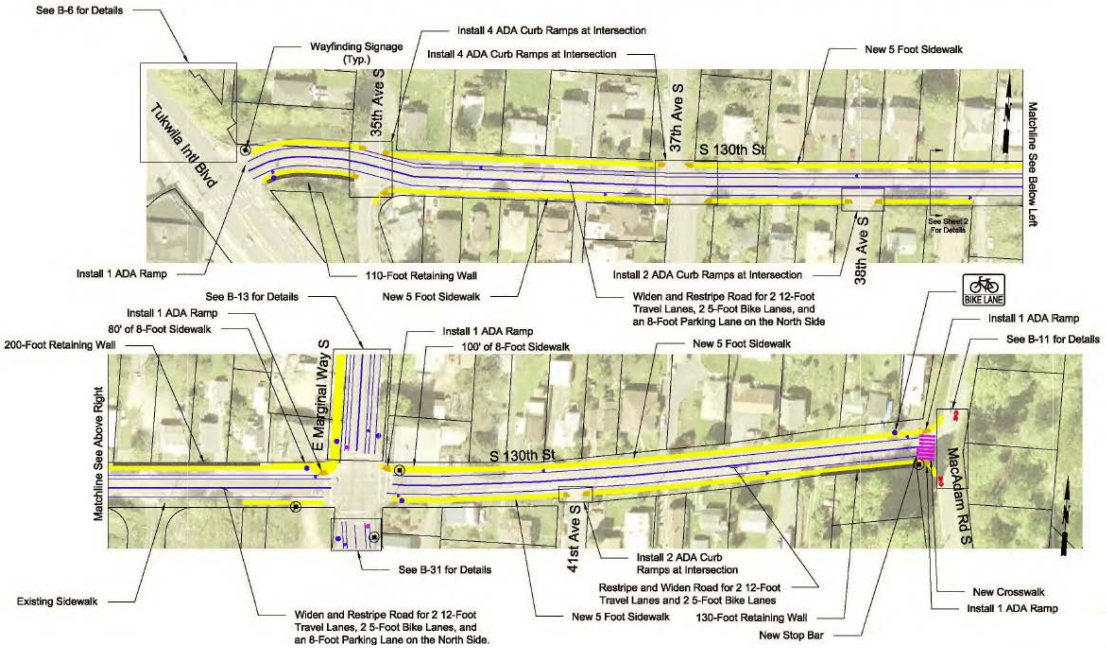
E Marginal Way S will be restriped to provide two 12 foot travel lanes, and a five foot wide bike lane on each side of the road between S 130th Street and Macadam Road S. Wayfinding signage will be placed along the route to guide users to the trail that connects through Riverton Park, as well as to the ramp in the vicinity of the Macadam Rd S bridge that connects E Marginal Way up to Macadam Road S.

Project 3.20.A. S 133rd Street and SR 599 Ramps: Intersection Improvements

This project would improve the intersection at S 133rd Street/SR 599 Ramps by adding new traffic signals. This project was assumed to occur as a background improvement to be completed prior to 2030.

Project 3.21.B. S 130th Street from Tukwila International Boulevard to Macadam Road S: Roadway Widening and Bicycle Facility Improvement (Walk & Roll P1 and B30)

In the long term, S 130th Street, between Tukwila International Boulevard and Macadam Road, will be widened and restriped to allow for a twelve foot wide travel lane in each direction, and a five foot wide bike lane in each direction. A new five foot wide sidewalk will be constructed on both the north and south sides of the road and ADA accessible curb ramps installed at the sidewalks. Bicycle wayfinding will be added at key locations. Between Tukwila International Boulevard and E Marginal Way S, an eight foot wide parking lane will be provided along the north side of the road. No on-street parking will be allowed east of E Marginal Way S.



Project 3.22.B. E Marginal Way/40th Avenue S and S 130th Street: Intersection Improvement

The south leg of this intersection is split with E Marginal Way and 40th Avenue S. This unusual configuration can be confusing for drivers, cyclists, and pedestrians to navigate.

Recommendation

1. Maintain the existing four way stop operation as this intersection is not expected to meet a signal warrant. Continue monitoring conditions and install a traffic signal if warrants are met.
2. Re-align 40th Avenue S and create a new unsignalized intersection at E Marginal Way south of the intersection with S 130th Street. Consistent with the *Tukwila Bicycle Friendly Routes and Sidewalk Segments Improvement Options Report*, add paint or curbing at 40th Avenue S such that it meets E Marginal Way at an approximate 90 degree angle.

Recommended configuration of East Marginal Way and 40th Avenue S intersection

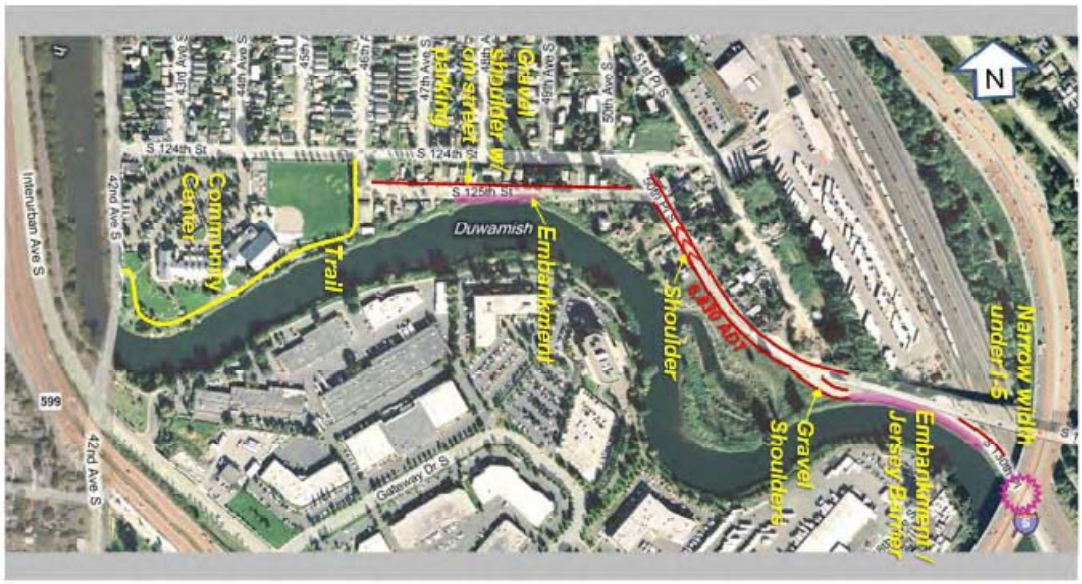
Project 3.23.A. S 115th Street / 42nd Avenue S Sharrows and Signage (Walk & Roll B11)

This project includes bicycle improvements along S 115th Street, 42nd Avenue S, and Macadam Rd S (between Interurban Avenue S and S 133rd Street). Along S 115th Street, the roadway will be designated as a shared bike route, with sharrows and signage installed in both the eastbound and westbound directions. The road will not be widened in the short term. On Macadam Rd S, the roadway will be signed as a bike route and sharrows will be installed.

Project 3.24.B. S 125th Street/50th Place S from 46th Avenue S to E City Limits: Bicycle Facility Improvement (Walk & Roll B15)

This project involves two design components. Along S 125th Street, bike route signage will be installed in both directions. Wayfinding signage will also be installed to direct bicyclists to the trail through the Community Center, to Codiga Park, and to 50th Place S.

Along 50th Place S, a 14 foot wide trail, separated by a four foot landscaped strip will be installed on the west side of the road, from S 125th Street to just north of Railroad Avenue.



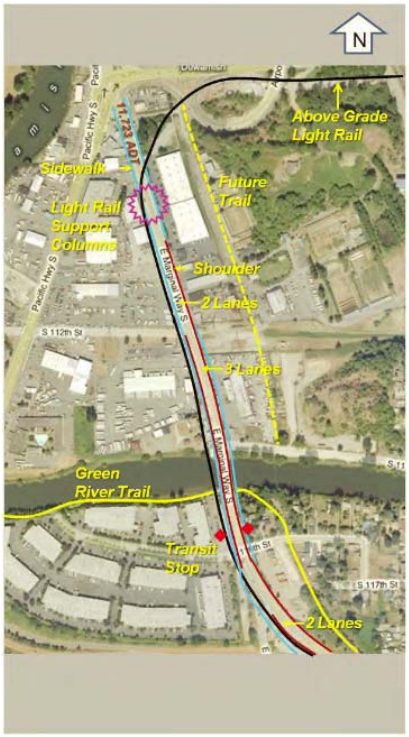
Project 3.25.B. Tukwila International Boulevard from S Boeing Access Road to 13400 Block Signal: Pedestrian Improvement (adapted from Walk & Roll B6)

This project includes improvements to Tukwila International Boulevard

South of the Green River bridge, from the SR 599 NB onramp to S 116th Street, a 12 foot multi-use trail would be constructed on the west side of the road, separated from the road by a concrete barrier. This trail will provide improved access to the existing trail along the Green River. South of S 116th Way, the trail would cross under the SR 599 SB offramp, and then follow the west side of the ramp for approximately 500 foot before it terminates and transitions to a new sidewalk south to the 13400 Block Signal.

Project 3.26.A. E Marginal Way from S Boeing Access Road to Interurban Avenue S: Bicycle Facility Improvement (Walk & Roll B9)

This project improves bicycle facilities along E Marginal Way S between Boeing Access Road and the intersection at Interurban Ave S. It includes restriping existing shoulders along E Marginal Way from Interurban Avenue S to S 112th Street, for five foot wide bike lanes in both the northbound and southbound directions. In the vicinity of the intersection with S 116th Street, wayfinding signage is recommended to guide bicyclists and pedestrians to the Duwamish River Trail. North of S 112th Street, sharrows will be installed in both directions due to the lack of roadway width, and to minimize impacts to adjacent businesses and their associated parking areas. As of Fall 2011, it appears that at least a portion of this project has been completed, namely the shoulder striping between S 112th Street and Interurban Avenue S.

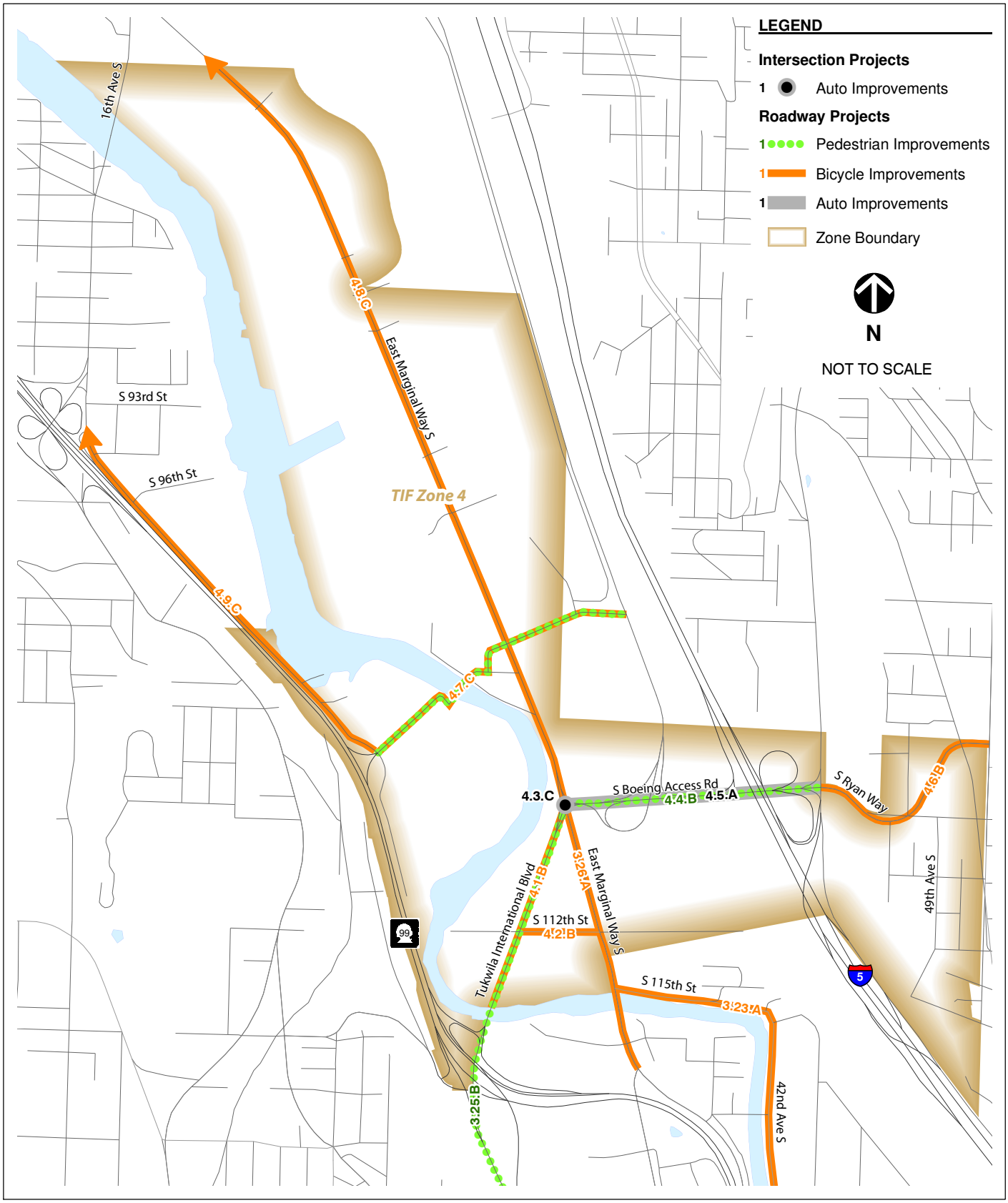


TIF ZONE 4 RECOMMENDED TRANSPORTATION IMPROVEMENTS

This section provides details on the 2030 recommended transportation improvements that are located in Tukwila TIF Zone 4. The projects shown in **Table 25** are based on the evaluation of existing and 2030 transportation operations, the City's 2012-2017 Transportation Improvement Program, and the Walk and Roll Plan. Estimated costs are also presented and **Figure 36** shows the location of these projects.

TABLE 25 – RECOMMENDED TRANSPORTATION IMPROVEMENTS IN TIF ZONE 4

Project	Location	Improvement	Priority A-B Cost (Thousands)	Priority C Cost (Thousands)
4.1.B	Tukwila International Blvd from S Boeing Access Rd to Green River	Bicycle Facility Improvement	$2,040	
4.2.B	S 112th St	Add bicycle lanes from Tukwila International Blvd to E Marginal Way	$786	
4.3.C	Boeing Access Rd / E Marginal Way S Intersection	Reconfigure to remove northbound through movement		$259
4.4.B	Boeing Access Rd Walkway	Provide sidewalks and improve pedestrian crossings	$3,062	
4.5.A	Boeing Access Rd	Bridge replacement from Airport Way to Interstate 5	$30,734	
4.6.B	S. Ryan Way from Martin Luther King Junior Way S to 51st Ave S	Bicycle Facility Improvement	$44	
4.7.C	S 102nd St and S Norfolk St from W Marginal Pl to Airport Way S	Bicycle Facility Improvement		$5,907
4.8.C	E Marginal Way from N City Limits to S Boeing Access Road	Bicycle Facility Improvement		$8,861
4.9.C	W Marginal Pl S from 14th Ave S to Existing Green River Trail	Trail Extension		$2,971
		TOTAL	$36,666	$17,998



FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig36_zone4.mxd

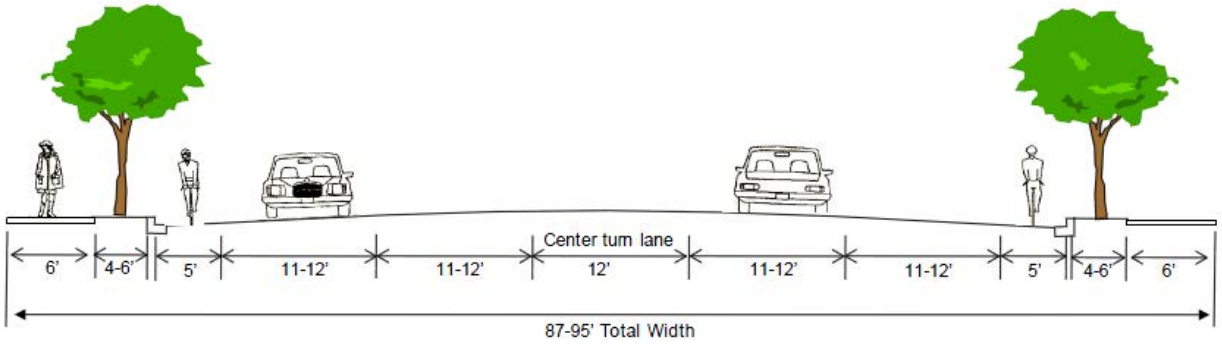
CITY OF TUKWILA - TIF ZONE 4 2030 PROJECTS

FIGURE 36

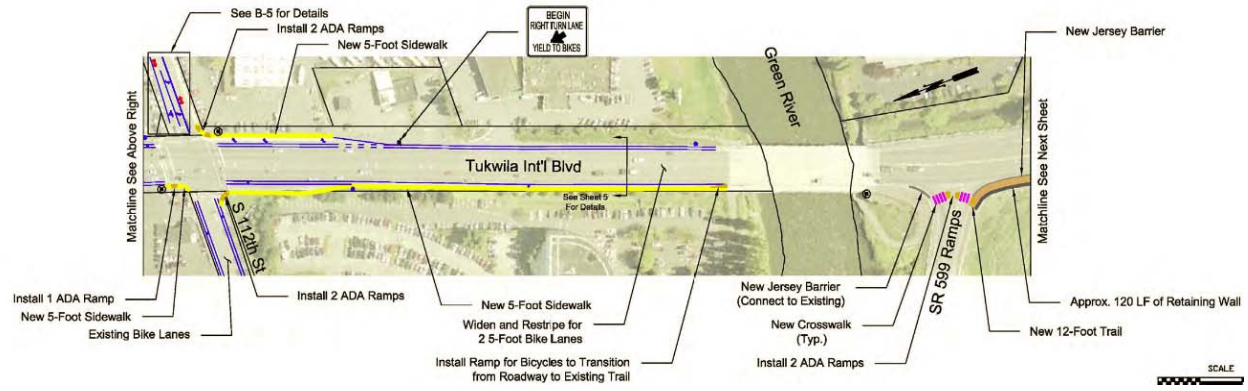
Recommended Improvements in TIF zone 4.

Project 4.1.B. Tukwila International Boulevard from S Boeing Access Road to Green River: Bicycle Facility Improvement (adapted from Walk & Roll B6)

This project includes improvements to Tukwila International Boulevard from Boeing Access Road to S 130th Street. The portion from Boeing Access Road to S 112th Street would include restriping to provide a five foot bike lane on both sides of the street. No pedestrian improvements would be made in this area. South of S 112th Street to the Green River bridge, the road would be widened and restriped to provide five foot bike lanes on each side, and a new five foot wide sidewalk on the west side would replace the existing sidewalk (which would be removed to allow for the bike lanes). A new five foot sidewalk would also be constructed on the southeast corner of Tukwila International Boulevard and S 112th Street, to replace the existing sidewalk that is removed to allow for the bike lanes.

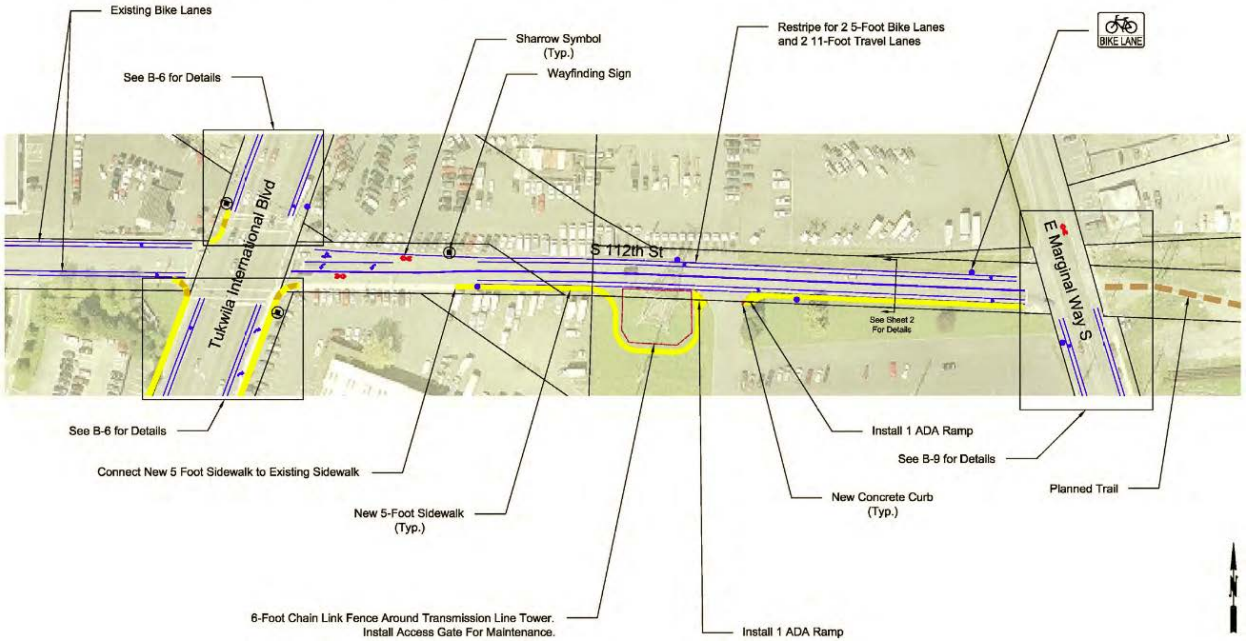


Typical Cross Section for Option 1 (Preferred Option)



Project 4.2.B. S 112th Street Bike Lanes, Tukwila International Boulevard to E Marginal Way (Walk & Roll B5)

This project includes restriping S 112th Street between Tukwila International Boulevard and E Marginal Way S to provide 5 foot wide bike lanes in both the east and west directions. The travel lanes will be restriped to two 11 foot wide lanes. At the western approach to Tukwila International Boulevard, the bike lanes will transition to sharrows (both directions), to minimize right-of-way needs and impacts to existing parking. Bike lanes were recently added to S 112th Street, west of Tukwila International Boulevard. The existing sidewalk along a portion of the south side of the road will be extended to E Marginal Way S. A transmission line tower is located along the south edge of the roadway, so the sidewalk would need to wrap around the tower at this location, and a chain link fence would need to be built around the tower. The project boundaries are within an area where the City does not currently have right-of-way. There are no anticipated impacts to existing utilities, although some fencing along the south side of the road may need to be relocated.



Project 4.3.C. S Boeing Access Road and E Marginal Way S/Tukwila International Boulevard: Intersection Improvement

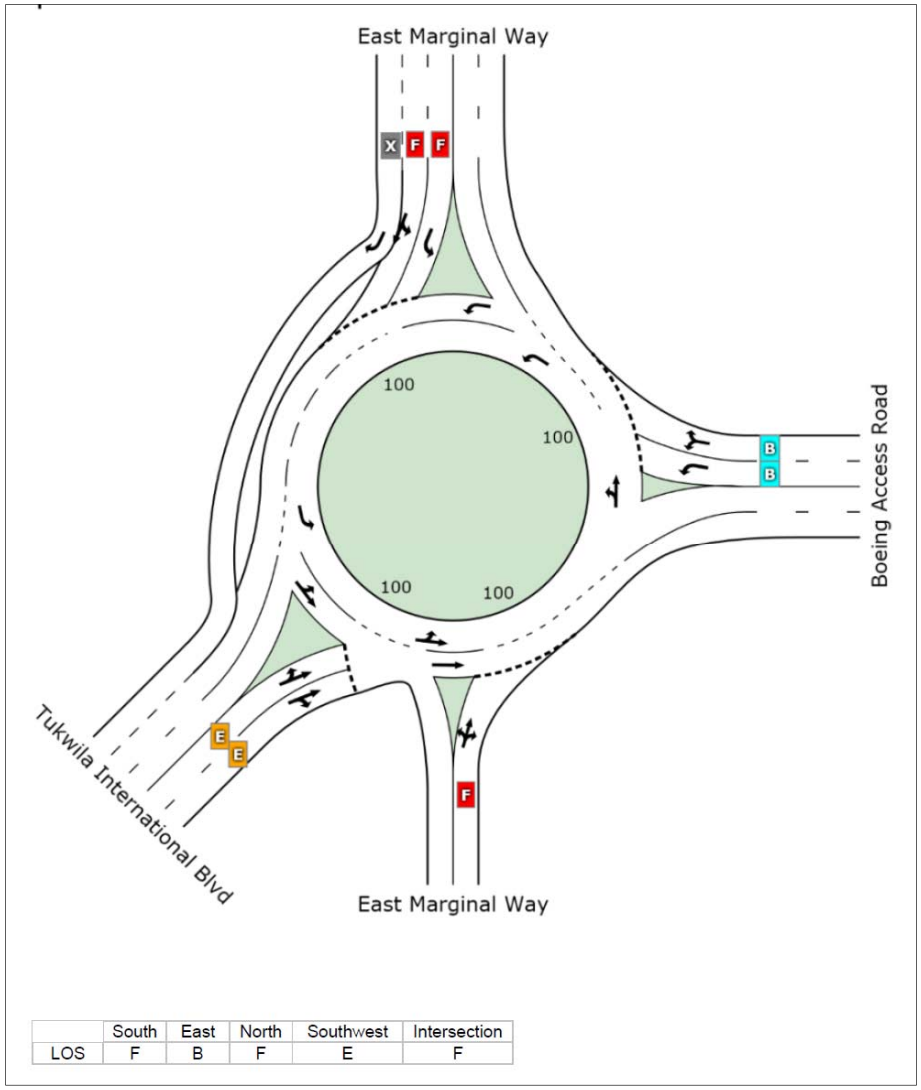
The intersection of Boeing Access Road, East Marginal Way S and Tukwila International Boulevard is a large and complex intersection. The Green River runs west of the intersection, which has four legs, but is at a skewed angle. This intersection operates at acceptable levels of service during the AM and PM peak hours under existing conditions; however, it is projected to operate at LOS E during the PM peak hour in 2030.

- 2010 level of service: LOS C (22 seconds of delay) in AM peak hour and LOS D (45 seconds of delay) in PM peak hour.
- 2030 level of service: LOS C (27 seconds of delay) in AM peak hour and LOS E (63 seconds of delay) in PM peak hour.

Two options have been analyzed to improve the 2030 level of service: 1) construction of a roundabout and 2) reduction of traffic movements.

Roundabout Analysis

The levels of service were calculated with a two-lane roundabout based on the method in Highway Capacity Manual 2000. Because of heavy traffic movements from westbound Boeing Access Road to southbound Tukwila International Boulevard, the southbound approach on E Marginal Way S would operate at LOS F during the PM peak hour in 2030. Similarly, heavy traffic movements from northbound Tukwila International Boulevard to eastbound Boeing Access Road would cause the northbound approach on East Marginal Way S to operate at LOS F during the PM peak hour. A two-lane roundabout would not improve the 2030 PM peak hour level of service problem.



	South	East	North	Southwest	Intersection
LOS	F	B	F	E	F

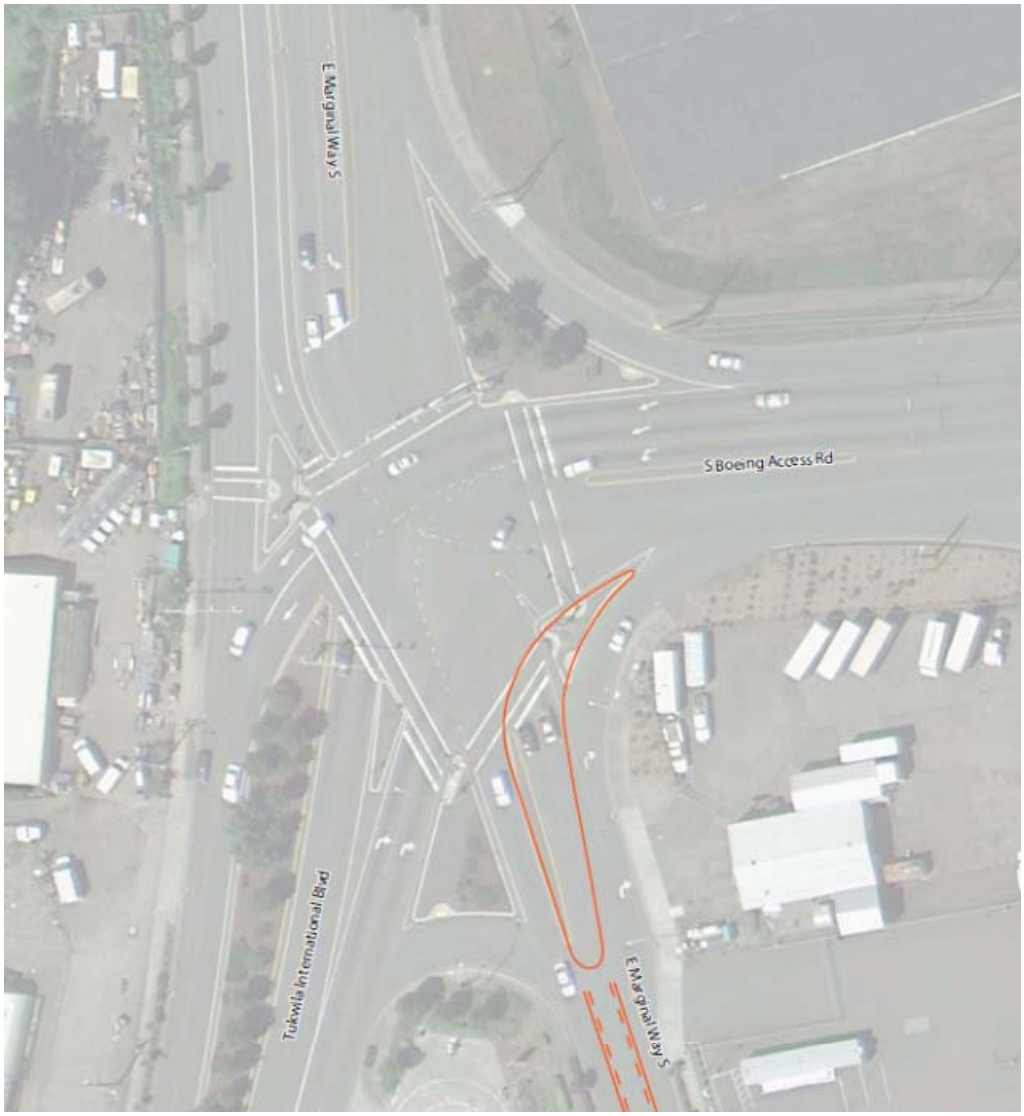
Traffic Movement Reduction

The most effective way to improve LOS at this intersection is to eliminate the northbound through movement on E Marginal Way S. By implementing this concept, there would be additional traffic on northbound Tukwila International Boulevard to E Marginal Way S, but the simplified signal phasing allows this additional traffic to be accommodated with less delay.

This intersection without the northbound E Marginal Way S movement would operate at LOS D in the PM peak hour in 2030. In addition to the level of service improvement for vehicles, the reduction of the movements would reduce pedestrian crossing distances.

Recommendation

Re-design the intersection by eliminating the northbound movement on E Marginal Way S.

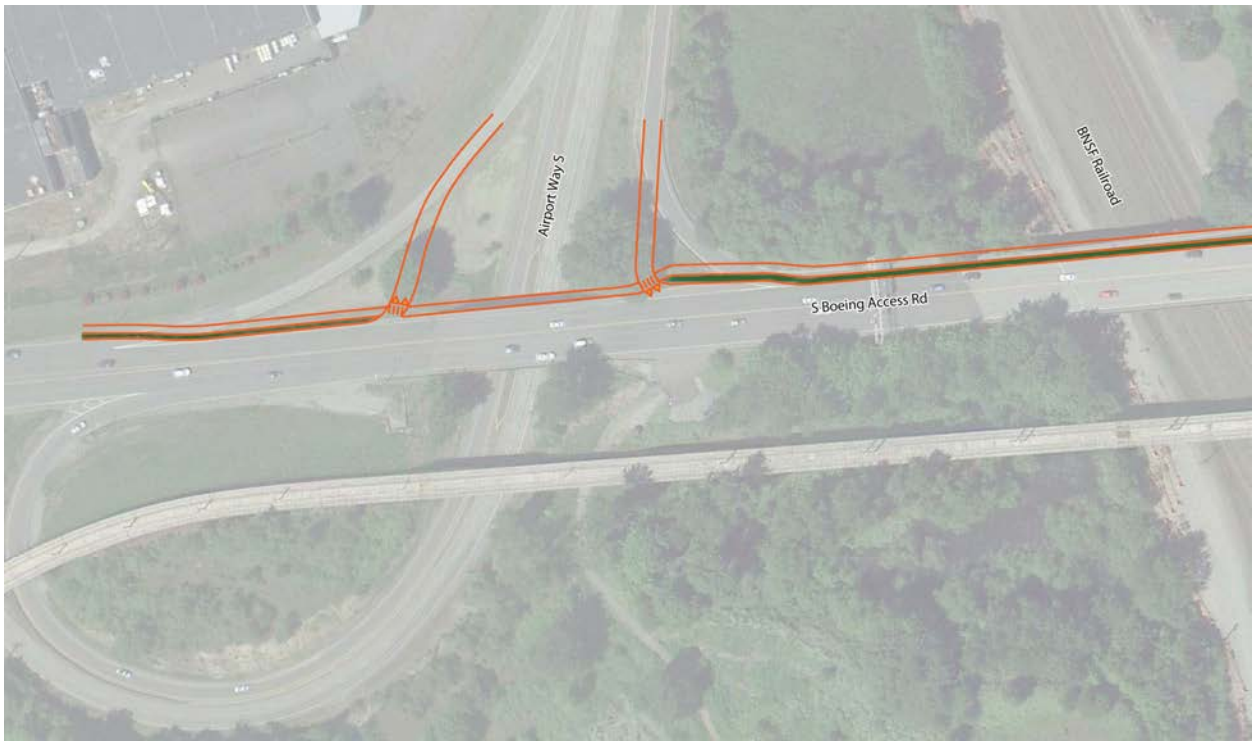


Project 4.4.B. S Boeing Access Road from Martin Luther King Junior Way S to E Marginal Way S: Walkway Improvement

The pedestrian LOS along Boeing Access Road is poor due to several factors: sidewalks are either not provided or are inadequate, and vehicle volume and speeds are high. While this corridor is not heavily used by pedestrians, there should be pedestrian facilities on at least one side of the street since there are very few crossing opportunities of I-5 in this portion of Tukwila. The north side already has several pieces of pedestrian infrastructure including sections of sidewalk and crosswalks. There are many challenges for adding a continuous sidewalk on this road between Martin Luther King Jr. Way S and E Marginal Way, including the design of the freeway off-ramps and the ramps from Airport Way S. In addition, the bridges were constructed without adequate sidewalks. It would be costly to widen the bridge structures to add sidewalks (although such a project is included in the TIP—see project 66); however, both the I-5 structure and the BNSF overcrossing provide the opportunity to reduce lane widths or eliminate an auxiliary lane (over the BNSF tracks) to reclaim road space for a sidewalk.

Recommendation

1. Provide sidewalks on the north side of S Boeing Access Road from MLK Jr. Way S to E Marginal Way S.
2. Re-align the southbound ramps from I-5 and Airport Way that connect with Boeing Access Road by creating intersections rather than sweeping ramps. These would reduce the crossing distance for pedestrians and slow down turning vehicles.



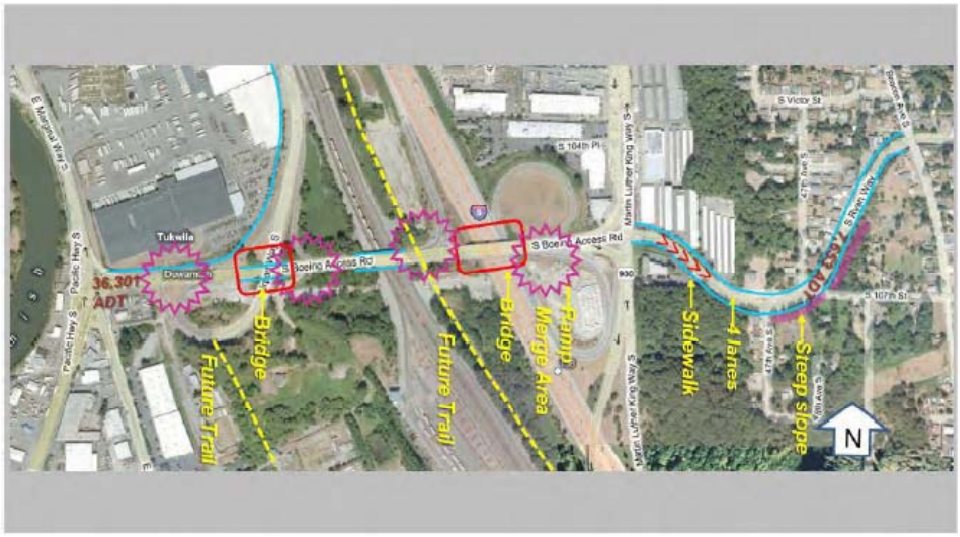

S Boeing Access Rd
BNSF Railroad
5

Project 4.5.A. S Boeing Access Road from Airport Way S to I-5: Bridge Replacement

This project will replace the Boeing Access Road bridges over Airport Way, the BNSF railroad tracks, and I-5. It is unlikely that these bridges would be replaced without support of a federal bridge replacement grant.

Project 4.6.B. S Ryan Way from Martin Luther King Junior Way S to 51st Avenue S: Bicycle Facility Improvement (Walk & Roll B3)

On Ryan Way, between Martin Luther King (MLK) Way S and 51st Avenue S, the road will be restriped as part of a road diet to provide two 11 foot wide eastbound (uphill) travel lanes and one 11 foot westbound lane. Today, there are two travel lanes in each direction, and no bike facilities. Five foot wide bike lanes will be installed on each side of the road. In the downhill (westbound) direction, the bike lane should be terminated in advance of the MLK intersection and the traffic lane tapered to match the existing lane configuration, which consists of three westbound lanes (left turn lane, through lane, through/right turn lane). Sharrows could be installed at the intersection with MLK Way to indicate continuation of the bike route to the west along Boeing Access Road, and to the north along MLK Way. Since there is no roadway widening proposed, the improvements will not impact any utilities, parking or structures, and can be made within the existing right-of-way.



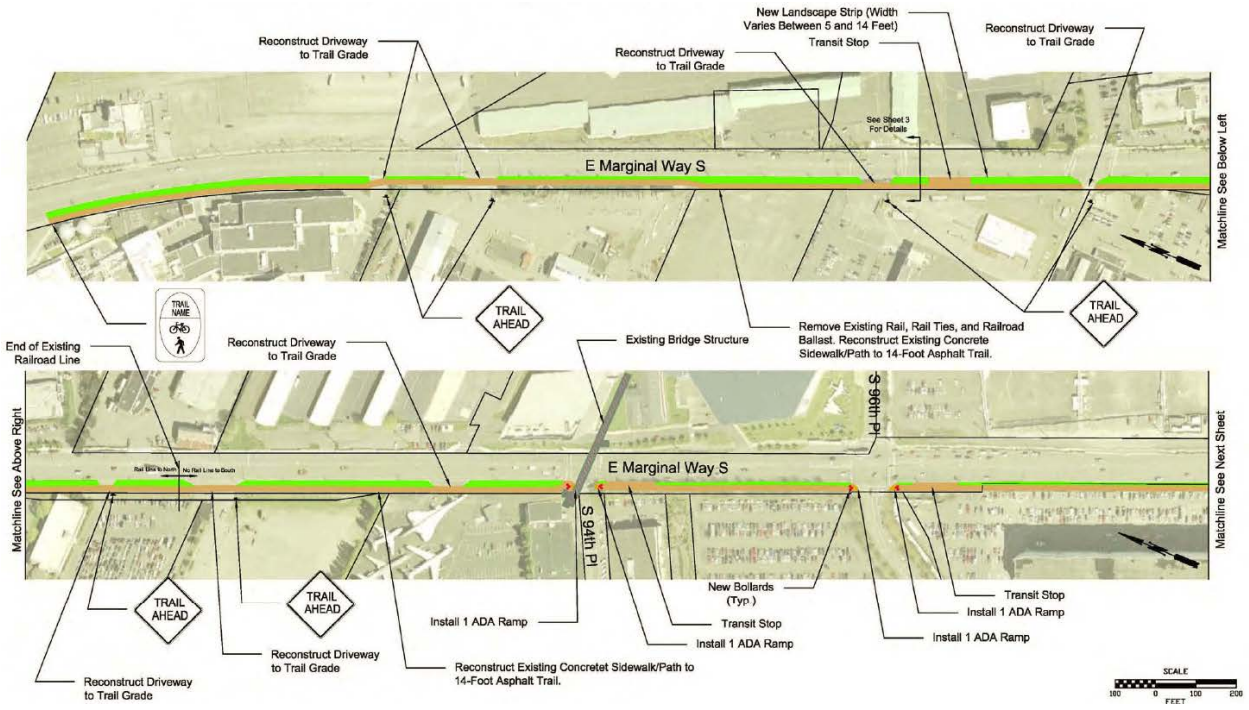
Project 4.7.C. S 102nd Street and S Norfolk Street from W Marginal Place to Airport Way S: Bicycle Facility and Sidewalk Improvement (Walk & Roll B10)

This project includes two components, including improvements to Norfolk Street and S 102nd Street. Along S Norfolk Street, a road diet is recommended, to reduce the current four lane cross section three lanes and add five-foot bike lanes on both sides. New sidewalks will be included on both the north and south sides of the roadway. The eastern portion of Norfolk Street is outside the Tukwila City limits; improvements to this section of Norfolk Street will need to be coordinated with the City of Seattle. All improvements can be constructed within the existing right-of-way, and no significant impacts are anticipated. At the intersection of Norfolk Street and Airport Way S, a crosswalk will be installed across Airport Way S to provide access to the northbound bike lane on that roadway. At the intersection of E Marginal Way S, it is recommended that a pedestrian signal with pedestrian activated buttons be installed for the crosswalk. In addition, the traffic signal should be modified to detect bicycles. There are no major utility impacts anticipated.

Along the north side of S 102nd Street, between East Marginal Way S and West Marginal Place, a multi-use trail is recommended.

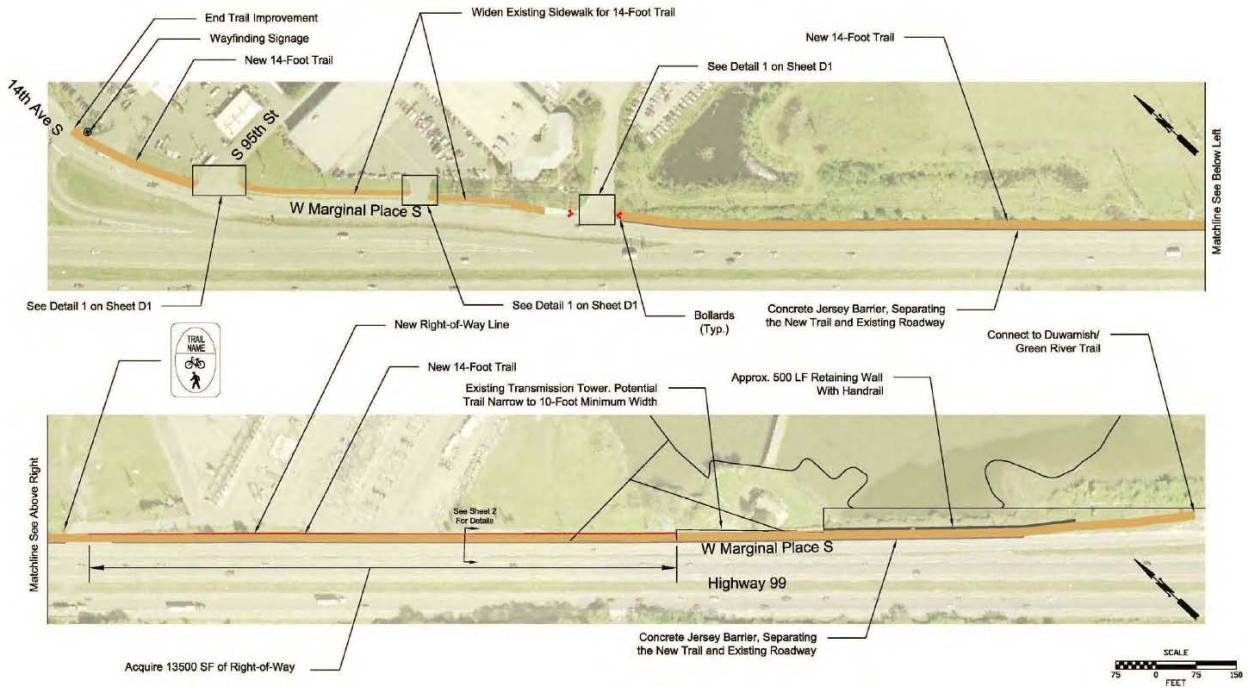
Project 4.8.C. E Marginal Way from N City Limits to S Boeing Access Road: Bicycle Facility Improvement (Walk & Roll B2)

This project would add a new multi-use trail on the west side E Marginal Way S from the northern city limits to S Norfolk St. The existing railroad would need to be removed in portions of this alignment. Where feasible, the existing sidewalk would be widened to create the new multi-use trail. Just north Norfolk St, the trail would narrow to the existing sidewalk width, due to the limited space and setback of the adjacent building. In general, the multi-use trail could be built within the existing right-of-way, but would require the closure/relocation of the existing rail line. In addition, it would require utility relocation.



Project 4.9.C. W. Marginal Place S from 14th Avenue S to Existing Trail: Bicycle Trail Extension (Walk & Roll B1)

This project is an extension of the Green/Duwamish River Trail along W Marginal Place S from its current trail ending. The northern portion of the trail will take advantage of an existing sidewalk by widening it to 14 feet. A 500 feet long retaining wall will be required along the east side of the trail for portions in close proximity to the river. Environmental permits would be required and approximately 13,500 SF of right-of-way would be required.



APPENDICES A – F

This section contains the Appendix Files for the City of Tukwila Transportation Element Update of the Comprehensive Plan. It is organized as follows:

- Appendix A contains the Multimodal Level of Service Analysis Report, previously submitted to the City.
- Appendix B contains maps detailing the segment-only pedestrian LOS.
- Appendix C contains the land use forecast information used to determine future auto LOS.
- Appendix D contains the revenue forecasts for transportation projects from 2011-2030.
- Appendix E contains the detailed cost estimate sheets used to develop costs for the detailed projects. Additional cost information was taken from the TIP and the Walk & Roll Plan and are available in their respective source document.
- Appendix F contains two projects that were considered, but ultimately dismissed as infeasible.

APPENDIX A:

MULTIMODAL LEVEL OF SERVICE ANALYSIS REPORT

Submitted by:
Fehr & Peers
11410 NE 122nd Way
Suite 320
Kirkland, WA 98034
(425) 820-0100

Prepared for:
City of Tukwila
Department of Public Works
6300 Southcenter Blvd.
Tukwila, WA 98188

January 2011

TABLE OF CONTENTS

ATTACHMENTS

Attachment A: Summary of Data Sources

Attachment B: Description of Assumptions

Attachment C: Non-Motorized Corridors, Existing Conditions

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1. INTRODUCTION

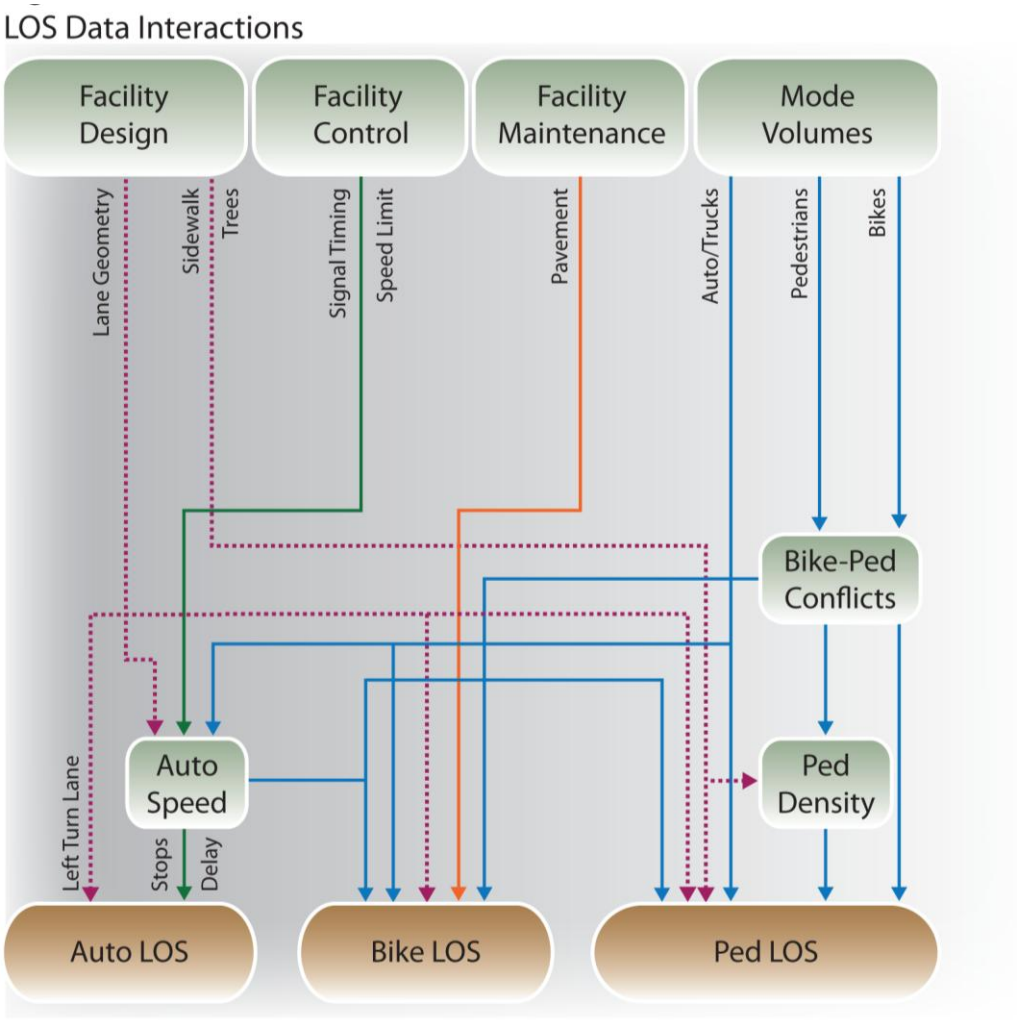
Fehr & Peers has completed a multimodal level of service (MMLOS) analysis for the City of Tukwila. As described in Deliverable #1 (attached as Attachment C), MMLOS summarizes the quality of the transportation system for autos, bicycles, and pedestrians based on the methodologies defined in NCHRP Project 3-70[1]. MMLOS is an advancement over traditional LOS techniques, which focus solely on automobile progression and delay to drivers.

This report summarizes the results of the MMLOS analysis for auto, bicycle, and pedestrian modes on roadway segments within the City of Tukwila. The results of the MMLOS analysis are followed by a list of preliminary recommendations for improving the LOS of poorly performing segments.

[1] These methodologies will also be included in the upcoming 2010 update to the *Highway Capacity Manual.*

CHAPTER 2. METHODOLOGY

A report by the National Cooperative Highway Research Program (NCHRP) Project 3-70 defines the methodologies to calculate MMLOS for auto, bicycle, transit, and pedestrian modes along roadway segments. These methods were applied to a set of major arterial roadways in the City of Tukwila to calculate LOS for pedestrian, bicycle, and auto modes. Although transit LOS is included in the MMLOS methodology, it was not calculated in this analysis as the City has no control over the transit service provided by King County Metro and Sound Transit. While LOS is determined independently for each mode, it is important to recognize variables that improve the LOS of one mode may worsen the LOS for another mode. For example, widening an intersection may improve auto LOS by reducing delay but worsen pedestrian and bicycle LOS by increasing crossing distances and exposure to conflicting vehicles. Thus balancing LOS by modes becomes a challenge, and in some cases it may be more appropriate to identify corridors that favor one mode over another to avoid creating a situation where all modes perform poorly. The diagram below highlights the interaction of the MMLOS data.



As described in Deliverable #1, the City of Tukwila identified 67 arterial study segments for MMLOS evaluation. In order to complete the MMLOS analysis for each mode, data were collected in both directions of the study segments. The data inputs for the MMLOS computation are summarized in Table 1. Due to construction activities and road closures, we were not able to collect data in the newly annexed southern portion of Tukwila, and these segments were not analyzed. In total, MMLOS was computed for 118 directional segments.

In accordance with MMLOS methodology, each segment must begin and end at a signalized intersection. While this was not the case for several of the designated segments, certain assumptions were made and are included in Attachment B. A summary of data sources that were used in the MMLOS calculations is provided in Attachment A.

TABLE 1 – MULTIMODAL LEVEL OF SERVICE DATA INPUT REQUIREMENTS

Data	Auto LOS	Bicycle LOS	Pedestrian LOS
Street Geometry			
Number of directional through lanes	X	X	X
Travel lane widths (feet)		X	X
Median width (if present, in feet)		X	
Bike lane width (if present, in feet)		X	X
Shoulder width (if present, in feet)		X	X
Planter strip width (if present, in feet)			X
Presence of barrier in planter strip (yes/no)			X
Sidewalk width (if present) (feet)			X
Presence of left hand turning lane(s) at intersections (yes/no)	X		
Length of analysis segment (feet)	X	X	X
Presence of right turn channelization islands at intersections (yes/no)			X
Number of cross-street through lanes at intersections			X
Cross-street curb to curb length (feet)		X	
Number of unsignalized intersections and driveways (per mile)	X	X	
Pavement condition (1-5 scale)		X	
Demand			
Intersection vehicle turning movements (vehicles per hour)	X	X	X
Vehicle right turn on red volume (vehicles per hour)			X
Vehicle peak hour factor (PHF)	X	X	X
Percent heavy vehicles		X	
Percent of on-street parking occupied		X	X
Intersection Control			
Saturation flow rate through lanes (vehicles per lane per hour)	X		
Green time per cycle for through movement (percentage)	X		X
Cycle length (seconds)	X		X
Quality of signal progression (1-5 scale)	X		
Speed limit (miles per hour)	X	X	X
Cross street speed limit (miles per hour)			X

Source: Fehr & Peers 2011

LOS DEFINITIONS

This section provides a qualitative description of how NCHRP Project 3-70 defines LOS for auto, bicycle, and pedestrian modes. The full equations necessary to compute MMLOS are complex and are not included in this report. Refer to the NCHRP documentation for additional details.

Auto LOS

Auto LOS is based on the average number of stops per mile and the presence of left turn lanes at signalized and unsignalized intersections along the roadway segment. Stops per mile are calculated using the volume to capacity (v/c) ratio and signal progression[2] of the through movement at the segment"s downstream intersection. With the exception of the presence of left-turn lanes at unsignalized intersections along the segment, auto LOS is completely dependent on the characteristics of the intersection located at the downstream end of the roadway segment. Roadway characteristics such as lane width or presence of street trees are not included in the methodology.

Bicycle LOS

Bicycle LOS is a weighted average of study segment LOS and intersection LOS. Bicycle segment LOS is based on vehicle volume, vehicle speed, number of lanes, percent heavy vehicles, parking conditions, lane and shoulder widths, pavement quality, and number of unsignalized conflicts[3]. Bicycle intersection LOS is based on vehicle volumes, bicycle crossing distance, and lane geometries. Bicycle LOS is not influenced by grades or other factors that may increase the physical difficulty of bicycling.

Pedestrian LOS

Pedestrian LOS is influenced by vehicle speed and volume, parking conditions, sidewalk width, buffer and barrier presence[4], shoulder or bike lane width, sidewalk and intersection geometry, and cross street speed and volume. Similar to bicycle LOS, pedestrian LOS is based on a weighted average of the segment and intersection LOS. Due to the nature of different modes of travel, appropriate scale of segments for automobile and bicycle LOS may not coincide with that of pedestrian travel. For this reason, a set of smaller segments were created for pedestrian LOS analysis.

---

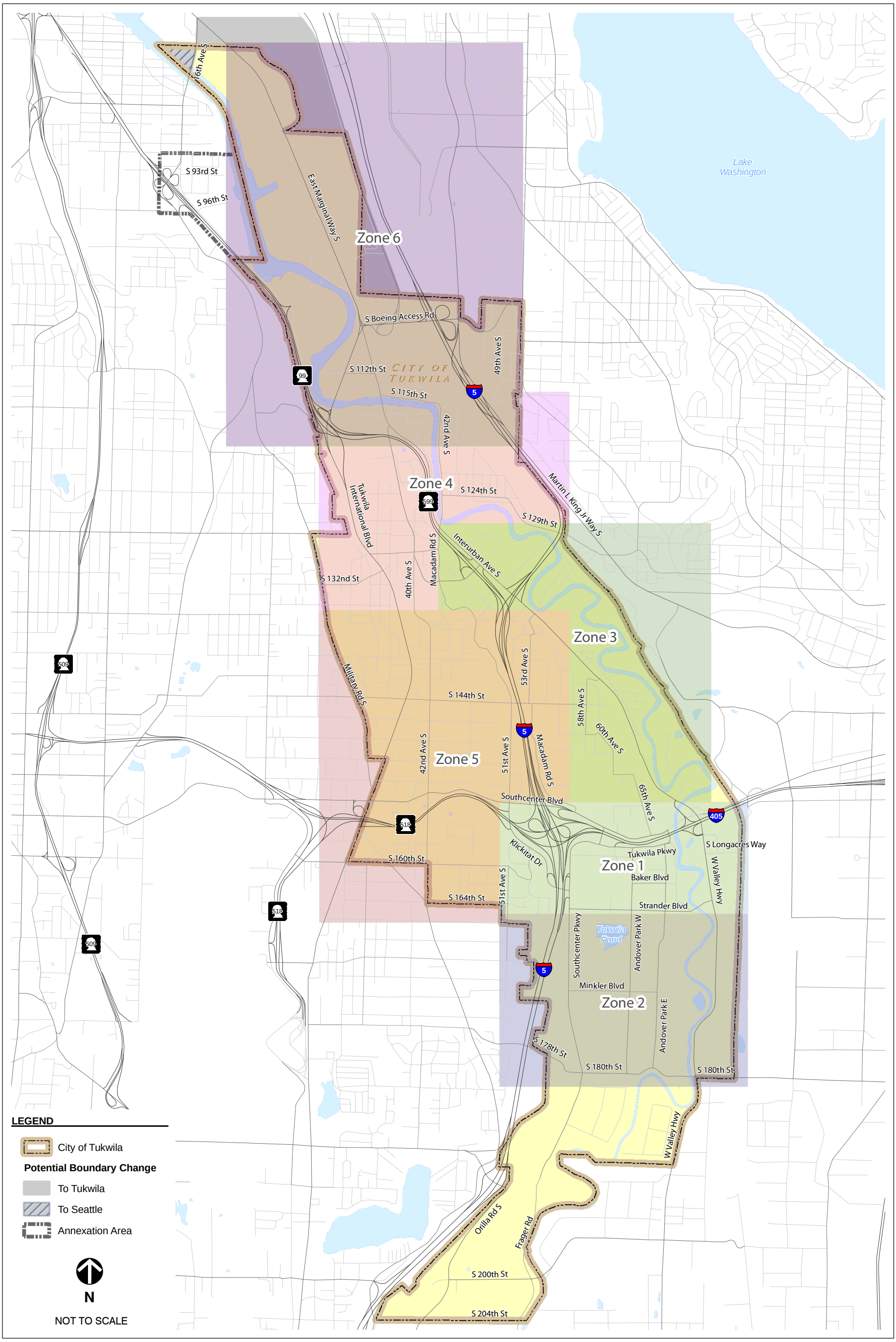
[2] Signal progression is a term from the Highway Capacity Manual, which describes the quality of signal coordination on a one to five scale. Signal progression of one represents very poor progression where vehicles are stopped by most traffic signals, while five represents exceptional progression where vehicles can proceed along a corridor with few stops or delays.

[3] Unsignalized conflicts are defined as unsignalized side street and driveway intersections.

[4] A buffer is an area (typically landscaped) between the edge of the sidewalk and the edge of the roadway. A barrier is a design feature that physically separates the pedestrians from the traffic stream. A barrier can be a railing, a low wall, or a row of closely spaced trees.

CHAPTER 3. RESULTS

Using the methodologies described above, MMLOS was determined for auto, bicycle, and pedestrian modes on the study segments in Tukwila. The study area was divided into six zones, as shown in Figure 1. The results are shown in Figures 2-7. Each figure number has three components-A showing auto LOS, B showing bicycle LOS, and C showing pedestrian LOS.

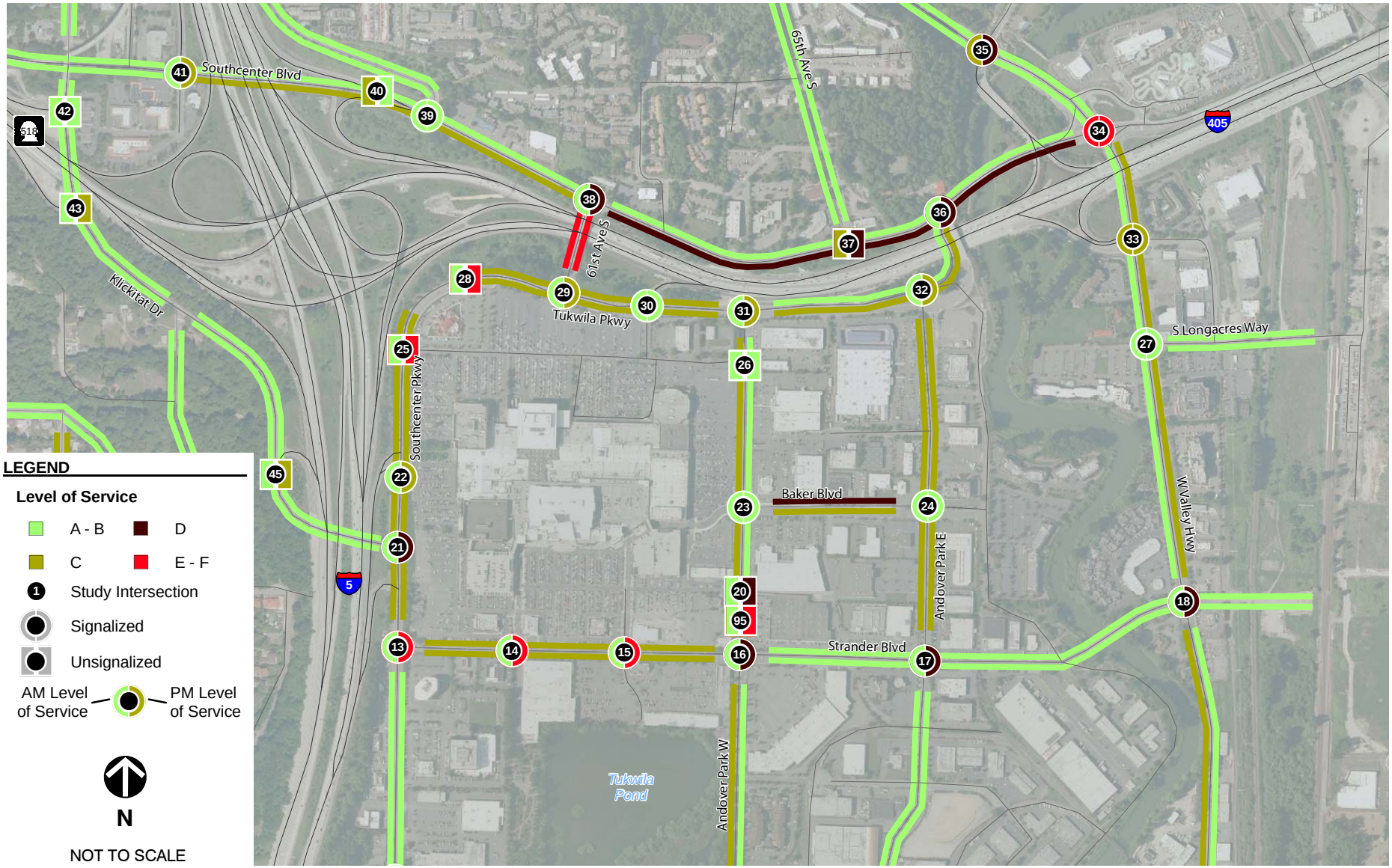


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\fig1_keyMap_noS.mxd

CITY OF TUKWILA - KEY MAP (ZONES)

FIGURE 1

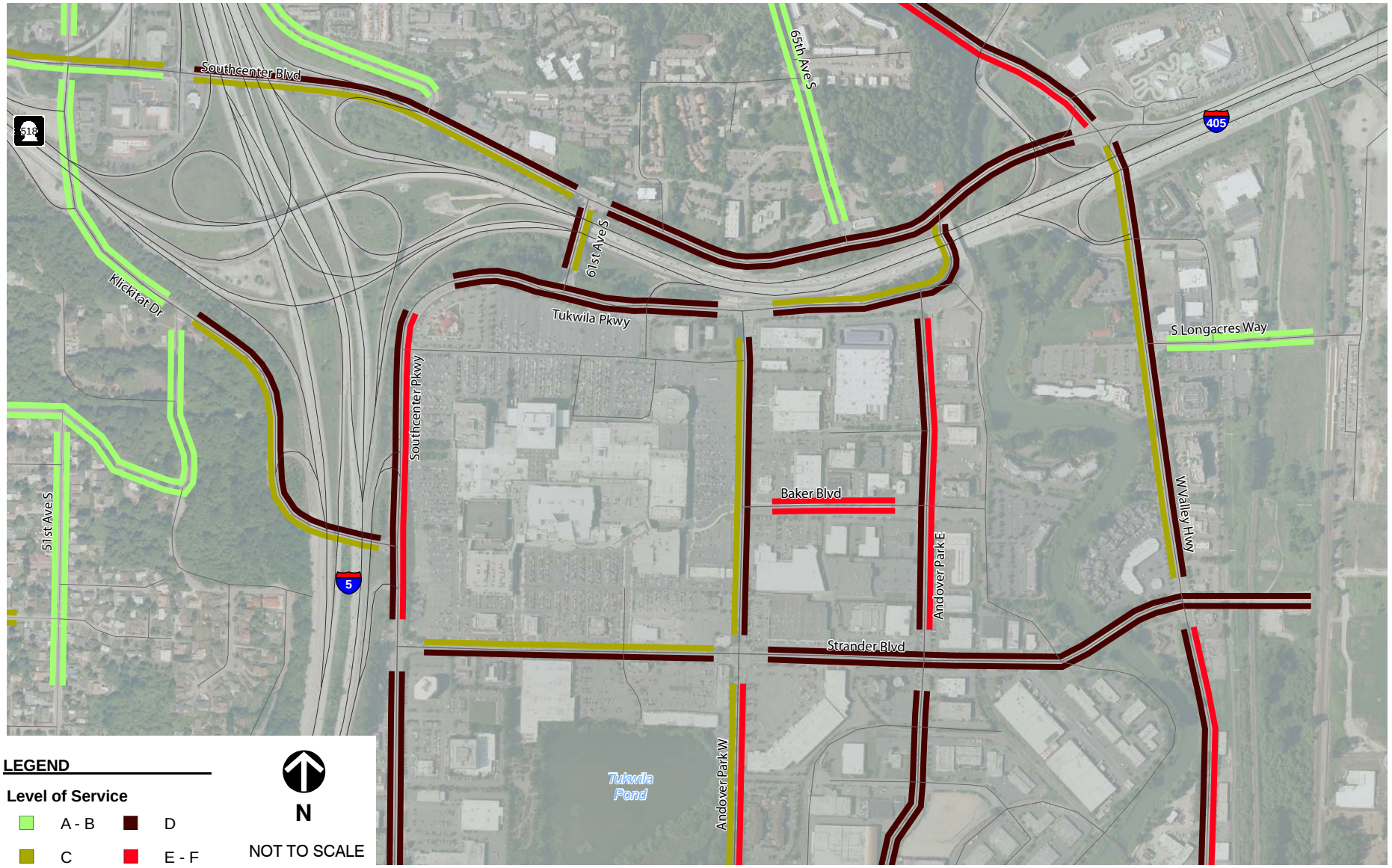


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig15A_los_zone1_INT.mxd

CITY OF TUKWILA - INTERSECTION AND ROADWAY AUTOMOBILE LEVEL OF SERVICE (ZONE 1)

FIGURE 2A

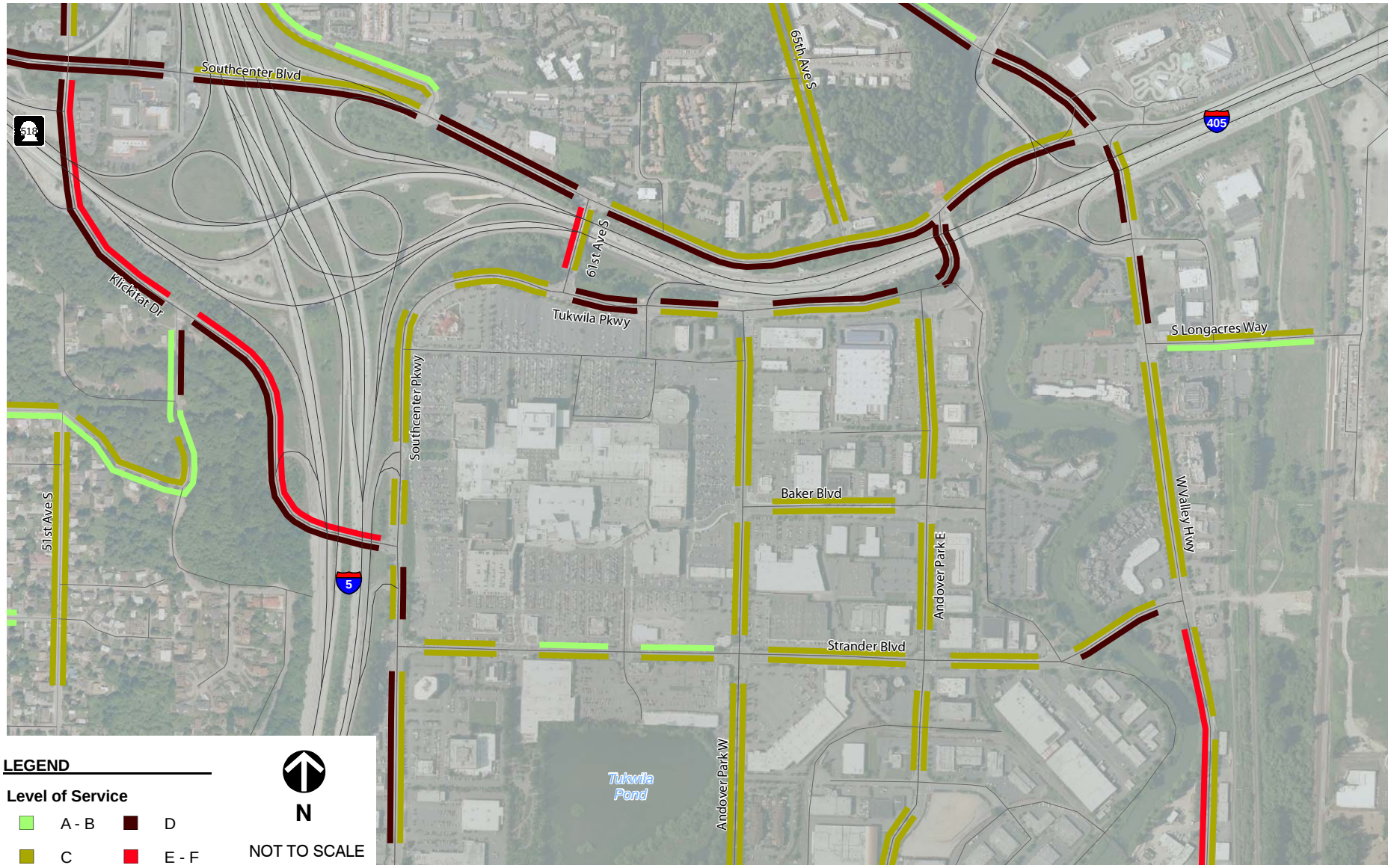


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig15B_los_zone1_BIKE.mxd

CITY OF TUKWILA - BICYCLE LEVEL OF SERVICE (ZONE 1)

FIGURE 2B

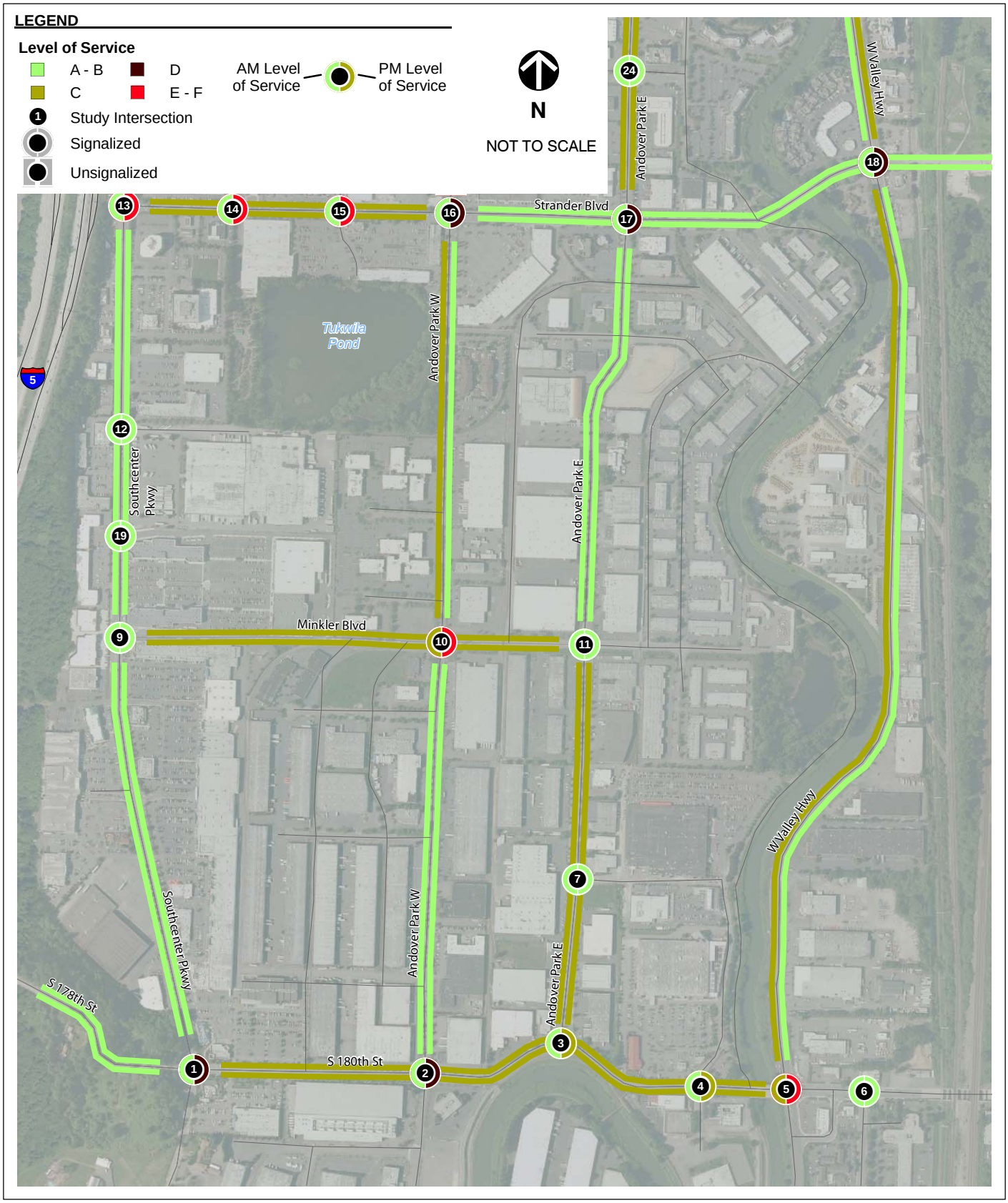


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig15C_los_zone1_PED.mxd

CITY OF TUKWILA - PEDESTRIAN LEVEL OF SERVICE (ZONE 1)

FIGURE 2C

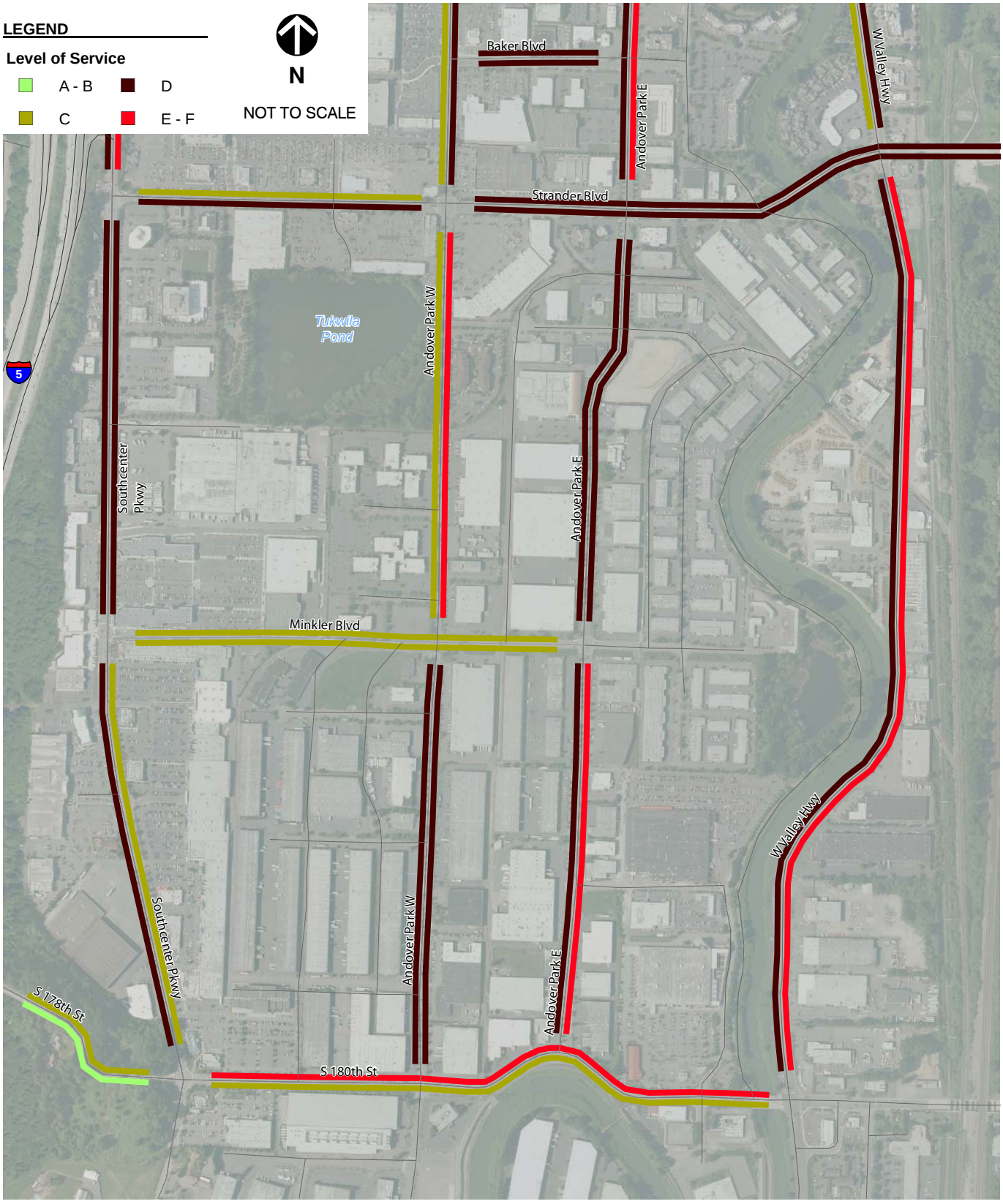


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig16A_los_zone2_INT.mxd

CITY OF TUKWILA - INTERSECTION AND ROADWAY AUTOMOBILE LEVEL OF SERVICE (ZONE 2)

FIGURE 3A

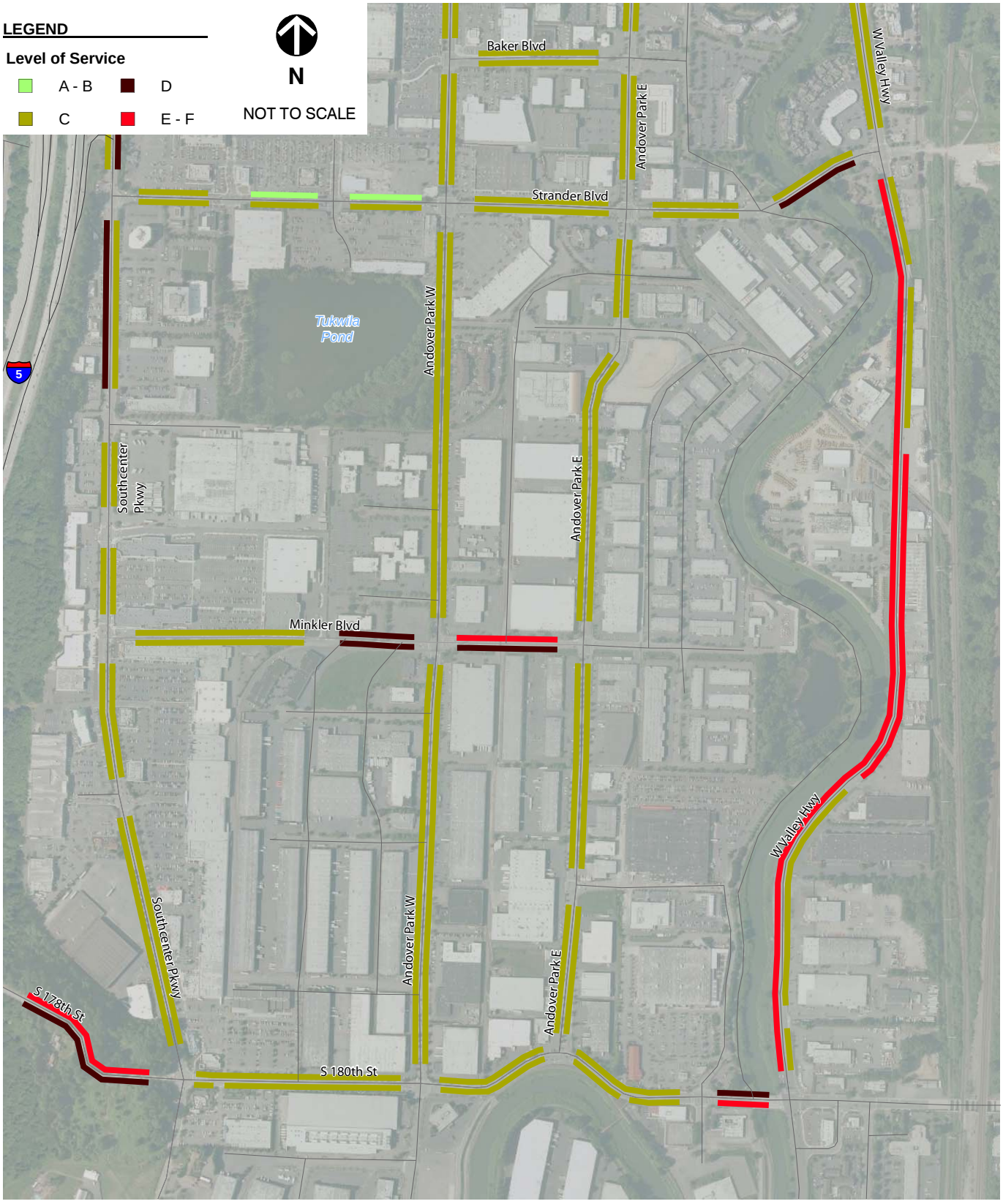


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig16B_los_zone2_BIKE.mxd

CITY OF TUKWILA - BICYCLE LEVEL OF SERVICE (ZONE 2)

FIGURE 3B

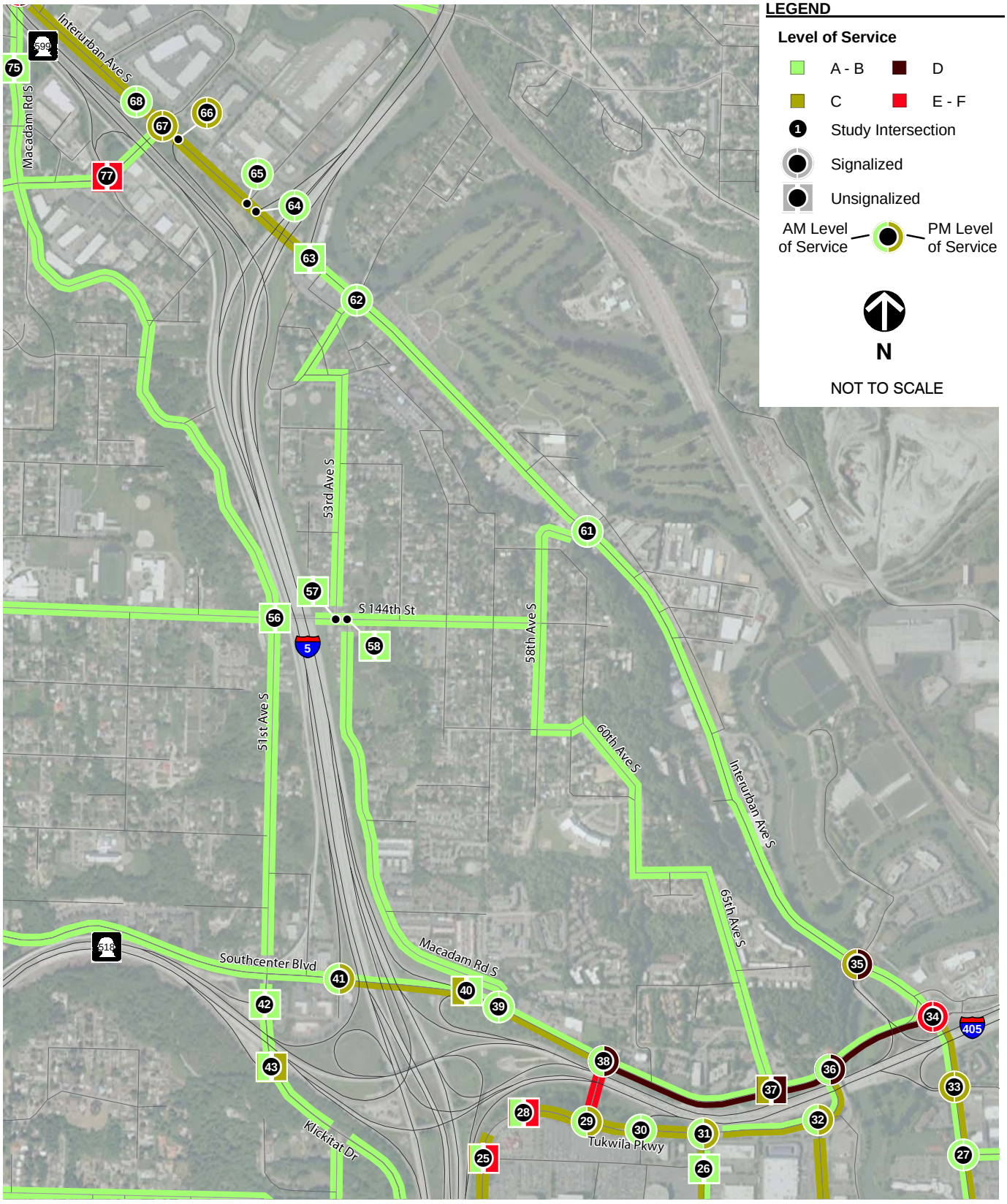


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig16C_los_zone2_PED.mxd

CITY OF TUKWILA - PEDESTRIAN LEVEL OF SERVICE (ZONE 2)

FIGURE 3C

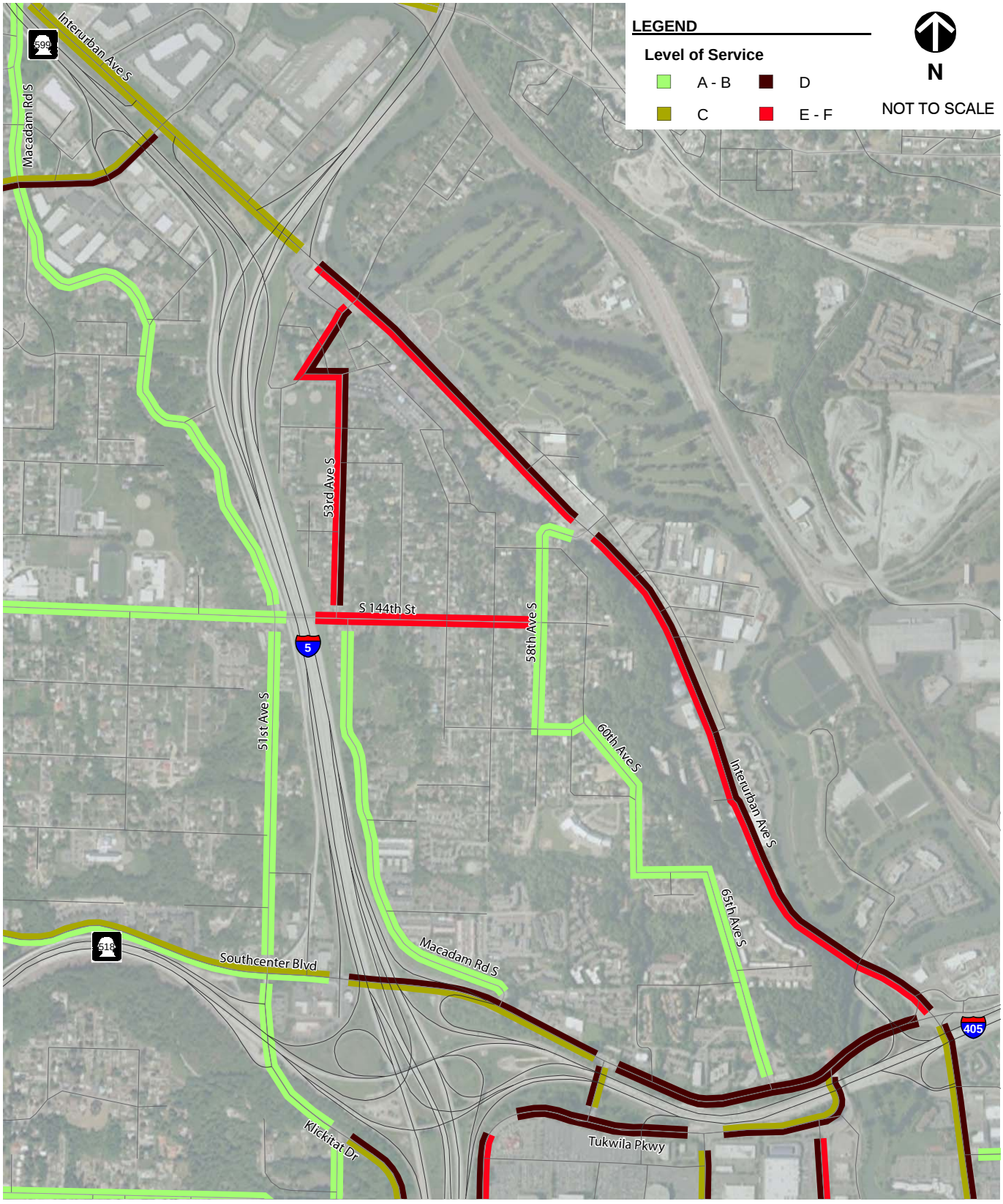


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig17A_los_zone3_INT.mxd

CITY OF TUKWILA - INTERSECTION AND ROADWAY AUTOMOBILE LEVEL OF SERVICE (ZONE 3)

FIGURE 4A

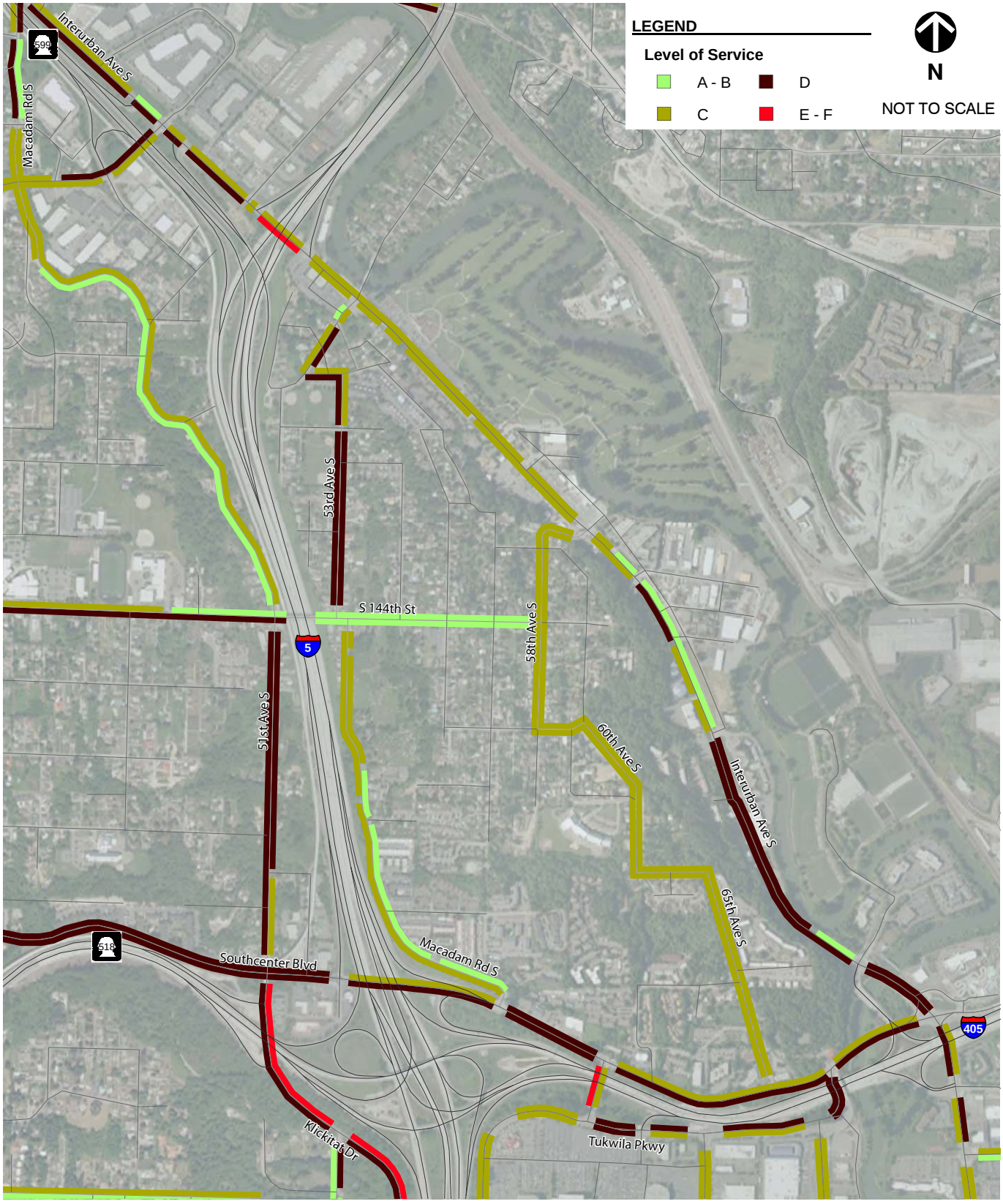


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig17B_los_zone3_BIKE.mxd

CITY OF TUKWILA - BICYCLE LEVEL OF SERVICE (ZONE 3)

FIGURE 4B

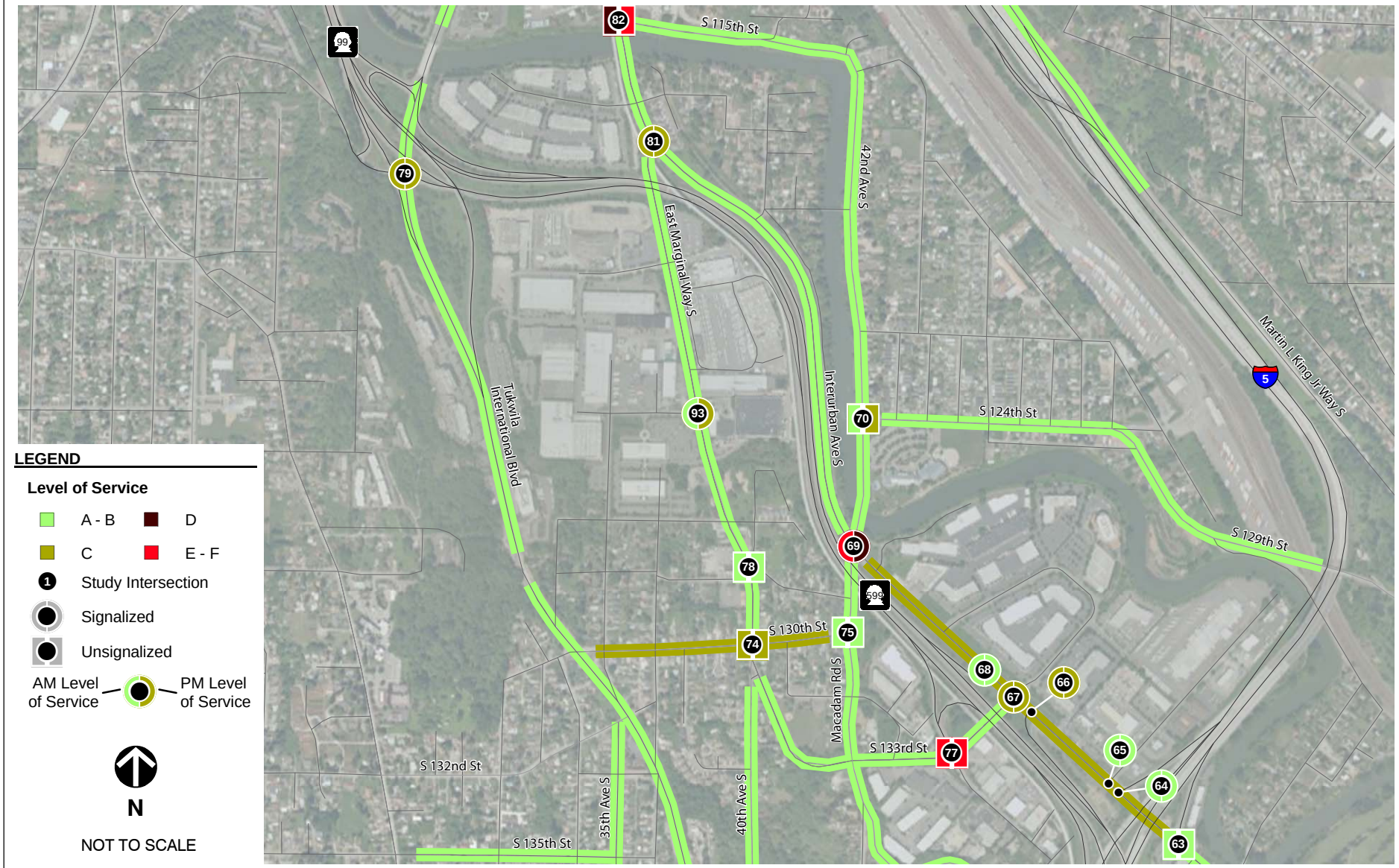


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig17C_los_zone3_PED.mxd

CITY OF TUKWILA - PEDESTRIAN LEVEL OF SERVICE (ZONE 3)

FIGURE 4C

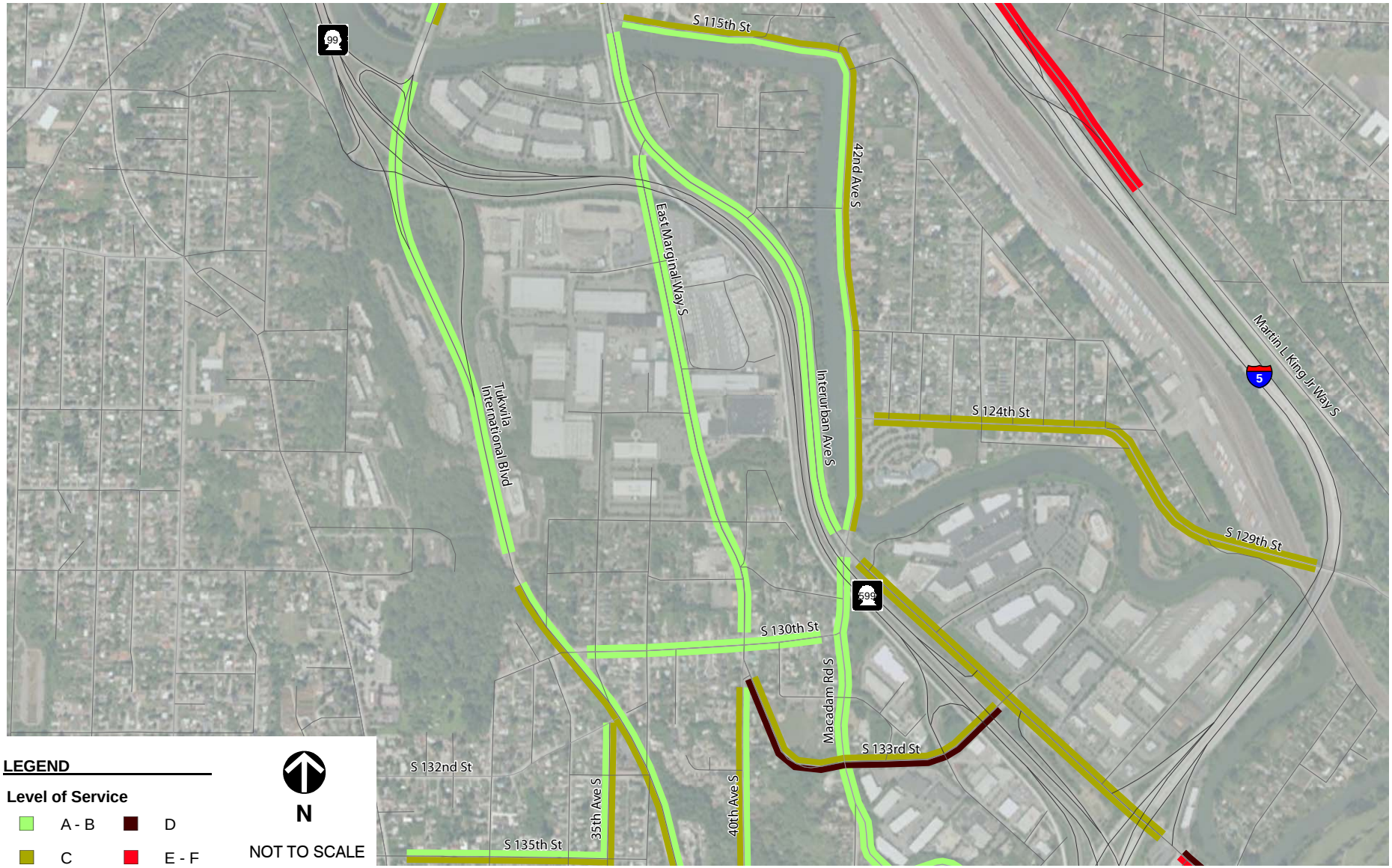


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig18A_los_zone4_INT.mxd

CITY OF TUKWILA - INTERSECTION AND ROADWAY AUTOMOBILE LEVEL OF SERVICE (ZONE 4)

FIGURE 5A

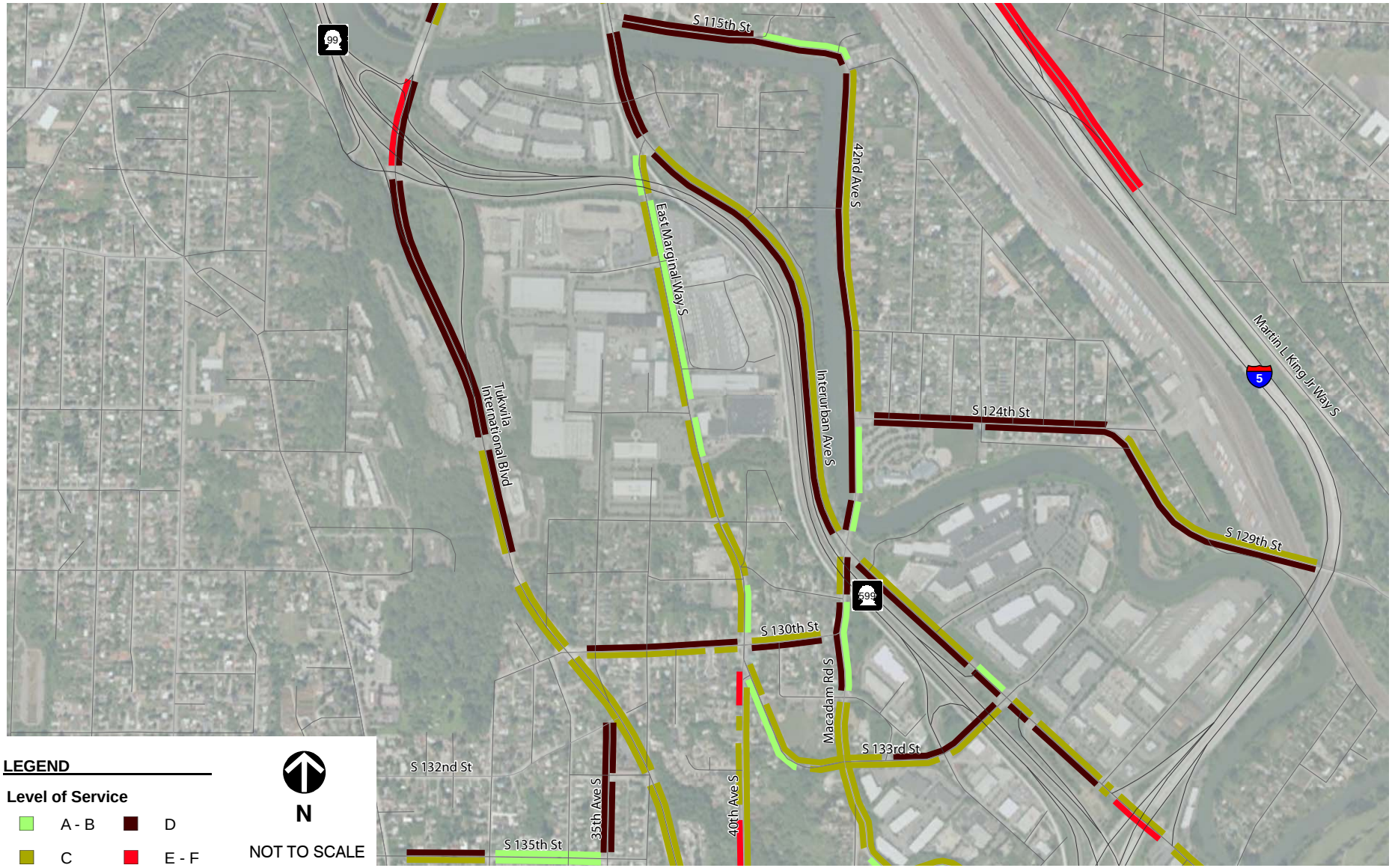


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig18B_los_zone4_BIKE.mxd

CITY OF TUKWILA - BICYCLE LEVEL OF SERVICE (ZONE 4)

FIGURE 5B

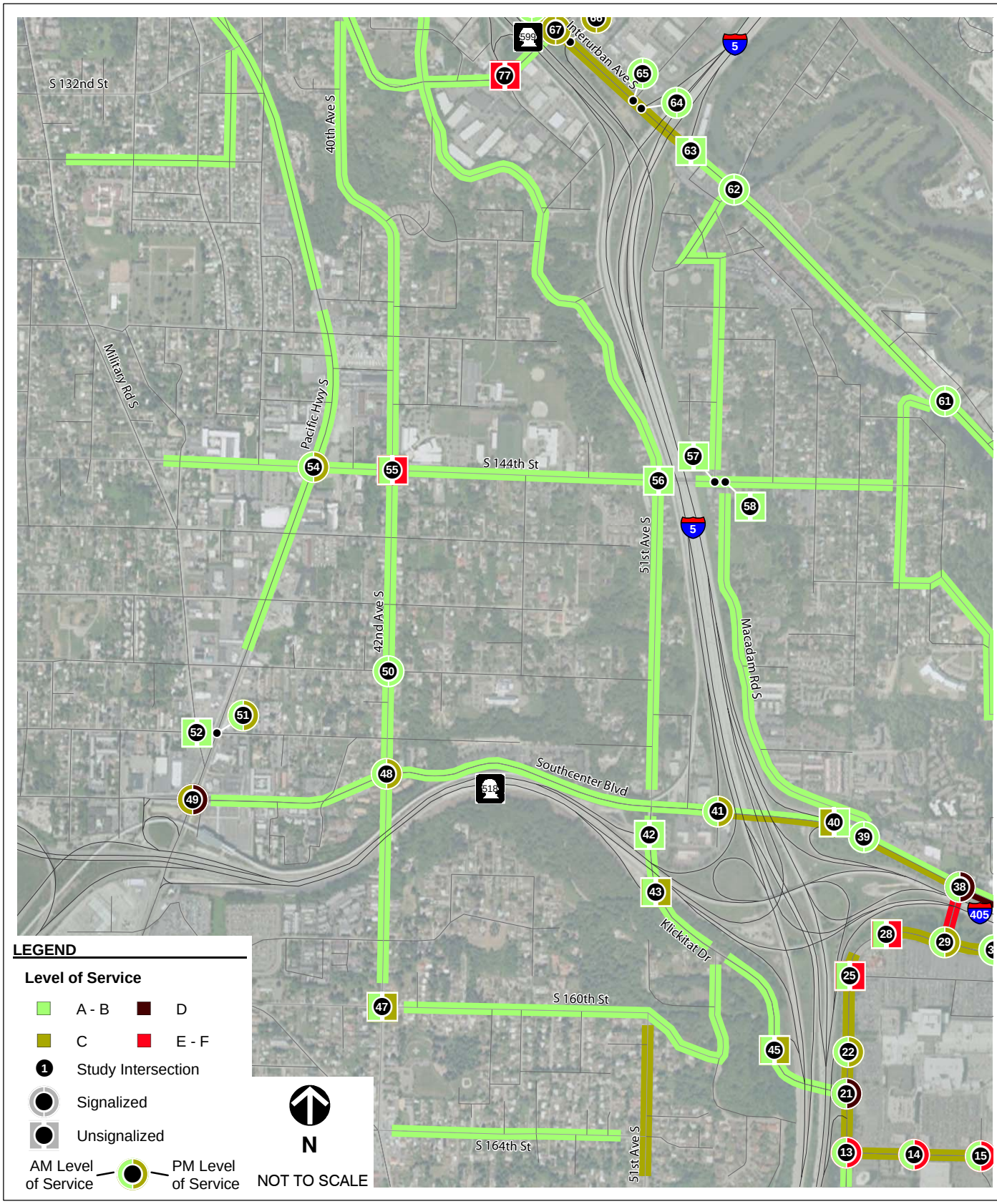


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig18C_los_zone4_PED.mxd

CITY OF TUKWILA - PEDESTRIAN LEVEL OF SERVICE (ZONE 4)

FIGURE 5C

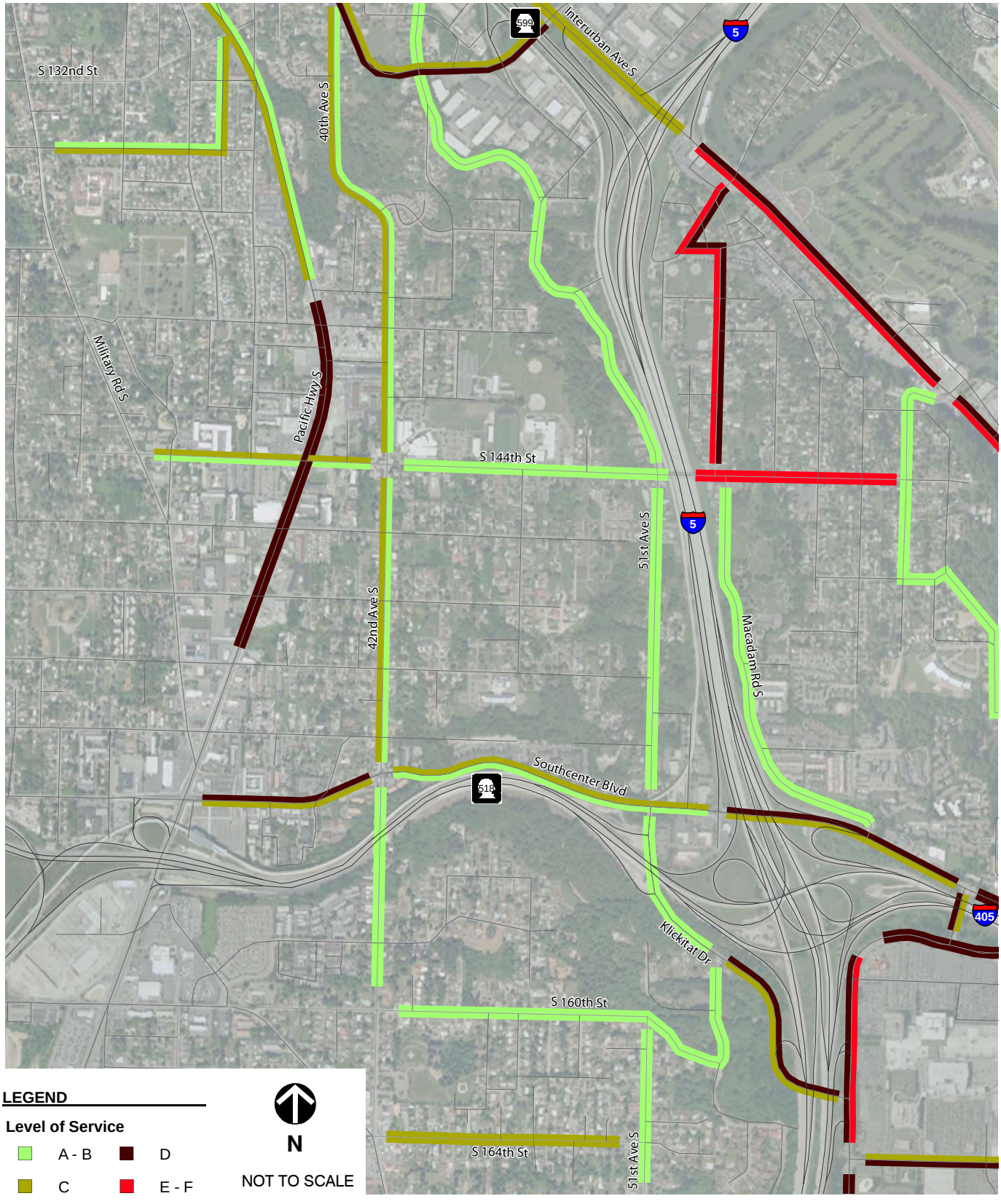


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig19A_los_zone5_INT.mxd

CITY OF TUKWILA - INTERSECTION AND ROADWAY AUTOMOBILE LEVEL OF SERVICE (ZONE 5)

FIGURE 6A

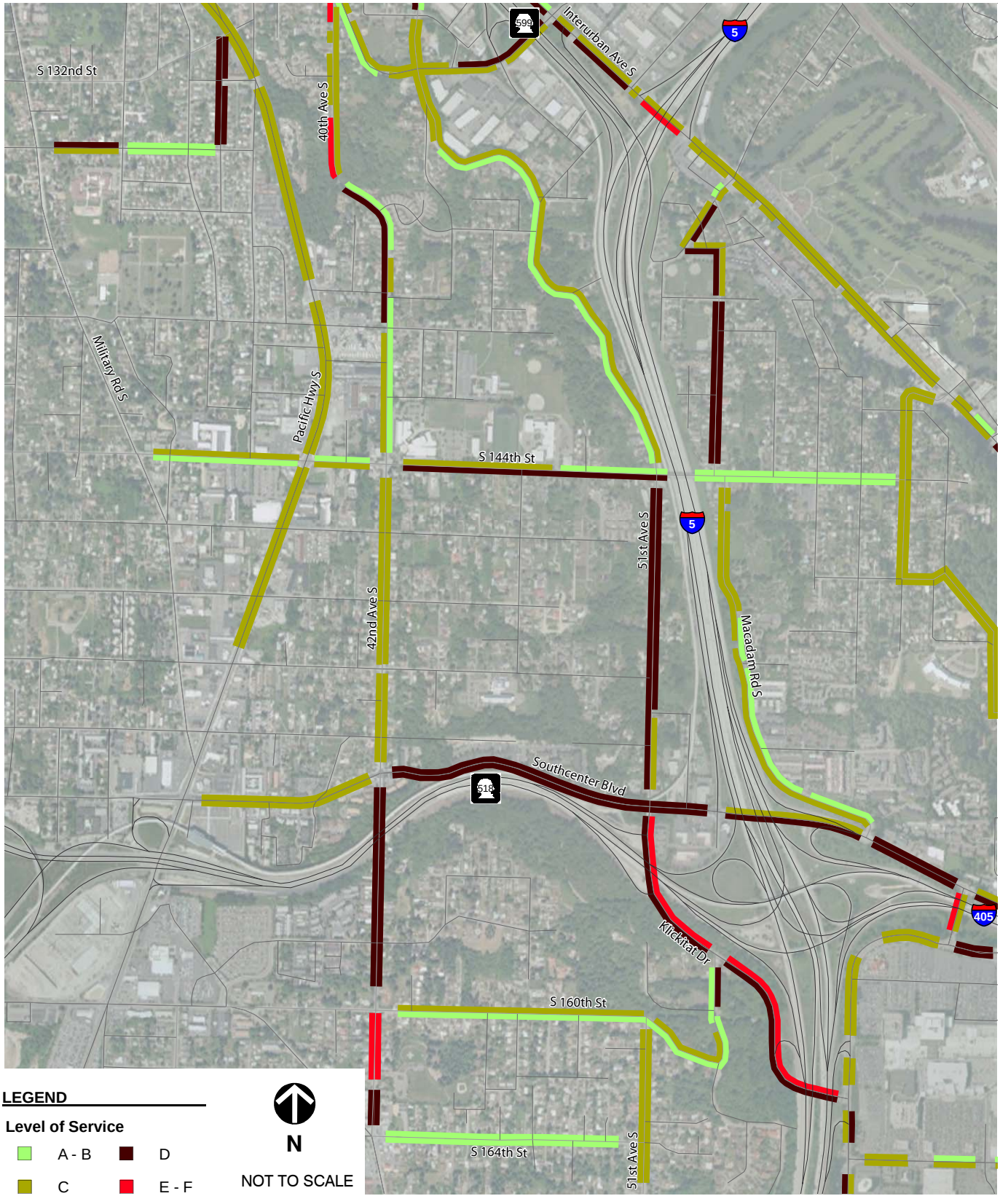


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig19B_los_zone5_BIKE.mxd

CITY OF TUKWILA - BICYCLE LEVEL OF SERVICE (ZONE 5)

FIGURE 6B

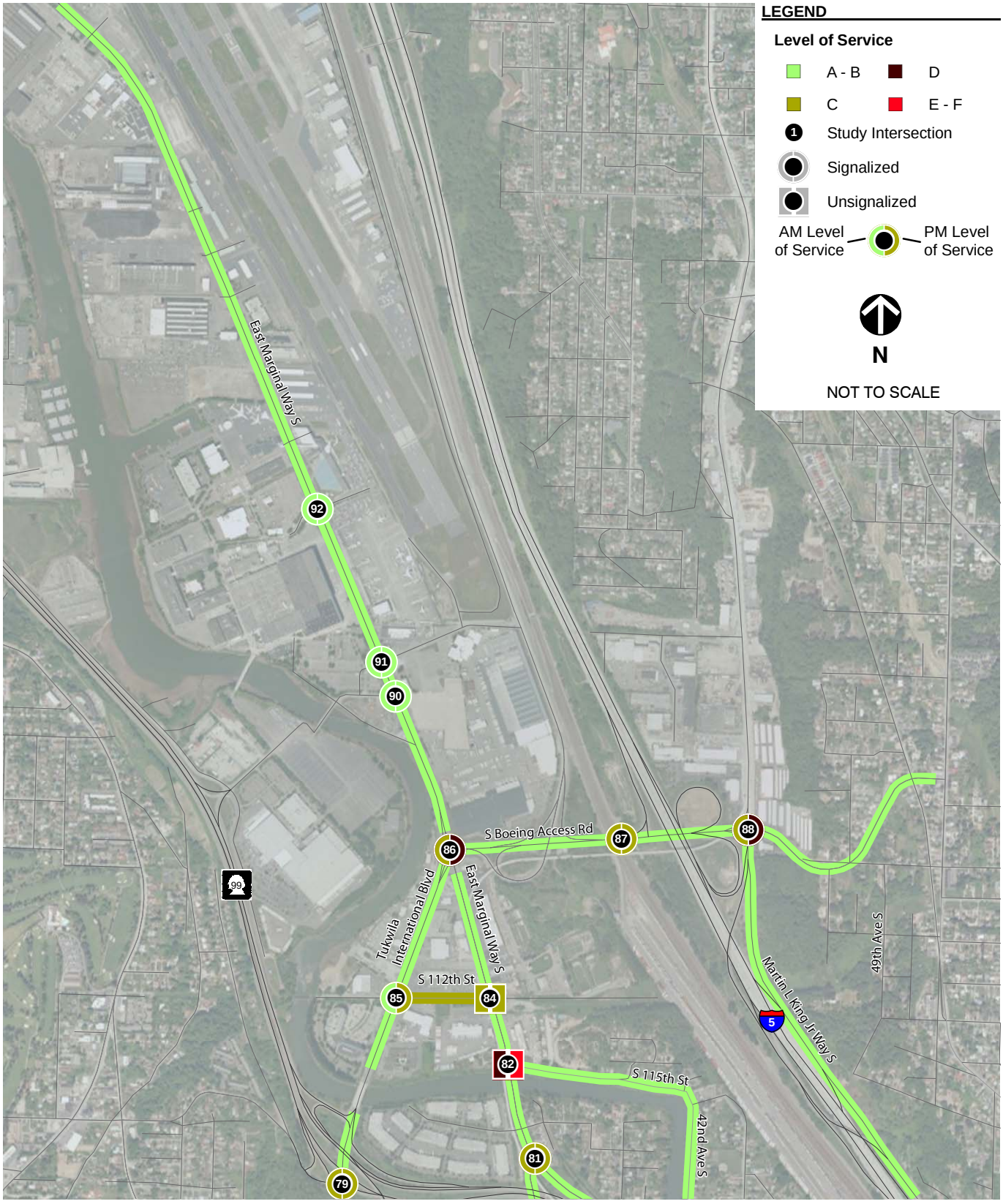


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig19C_los_zone5_PED.mxd

CITY OF TUKWILA - PEDESTRIAN LEVEL OF SERVICE (ZONE 5)

FIGURE 6C

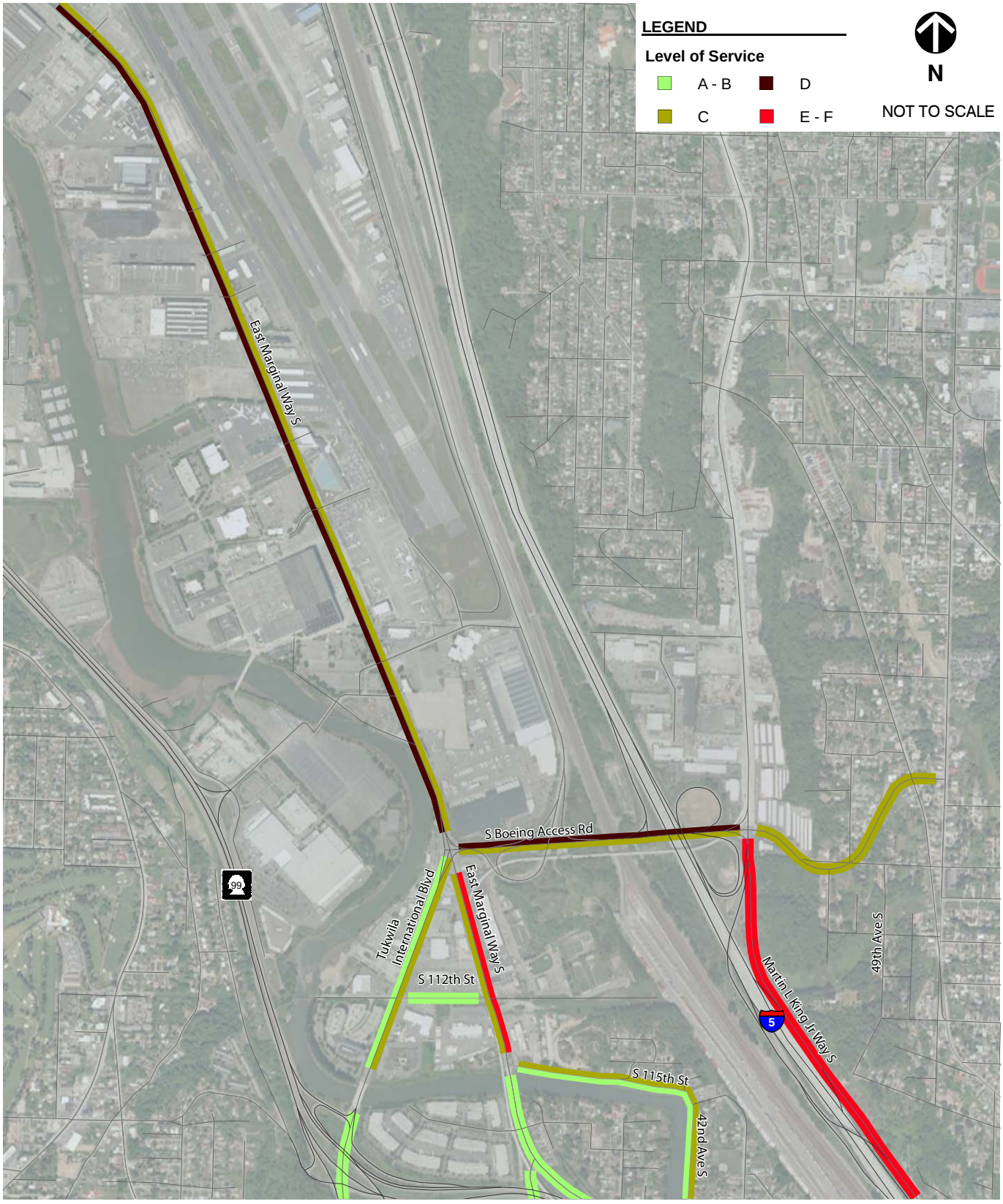


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig20A_los_zone6_INT.mxd

CITY OF TUKWILA - INTERSECTION AND ROADWAY AUTOMOBILE LEVEL OF SERVICE (ZONE 6)

FIGURE 7A

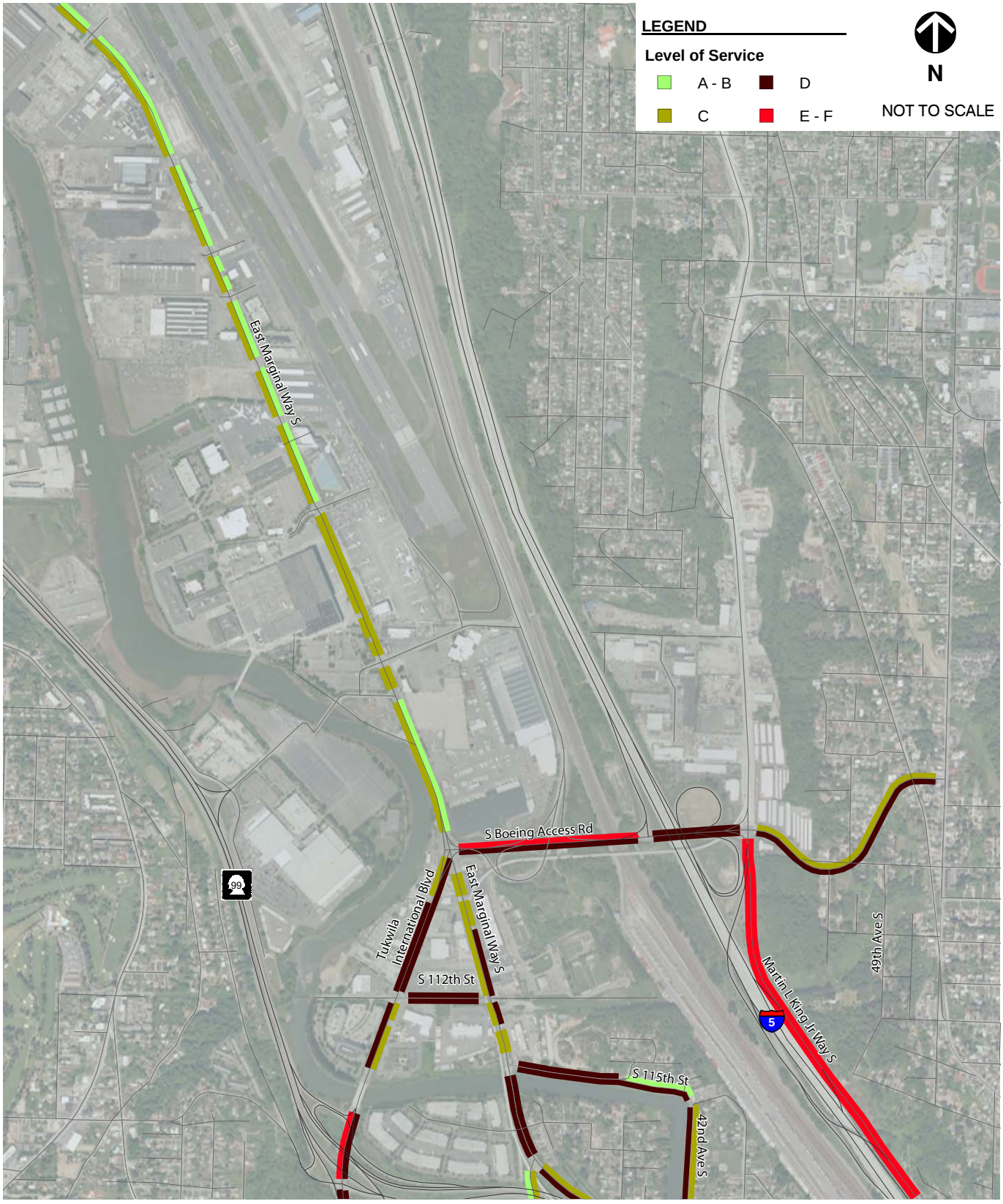


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig20B_los_zone6_BIKE.mxd

CITY OF TUKWILA - BICYCLE LEVEL OF SERVICE (ZONE 6)

FIGURE 7B



FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\ALL\fig20C_los_zone6_PED.mxd

CITY OF TUKWILA - PEDESTRIAN LEVEL OF SERVICE (ZONE 6)

FIGURE 7C

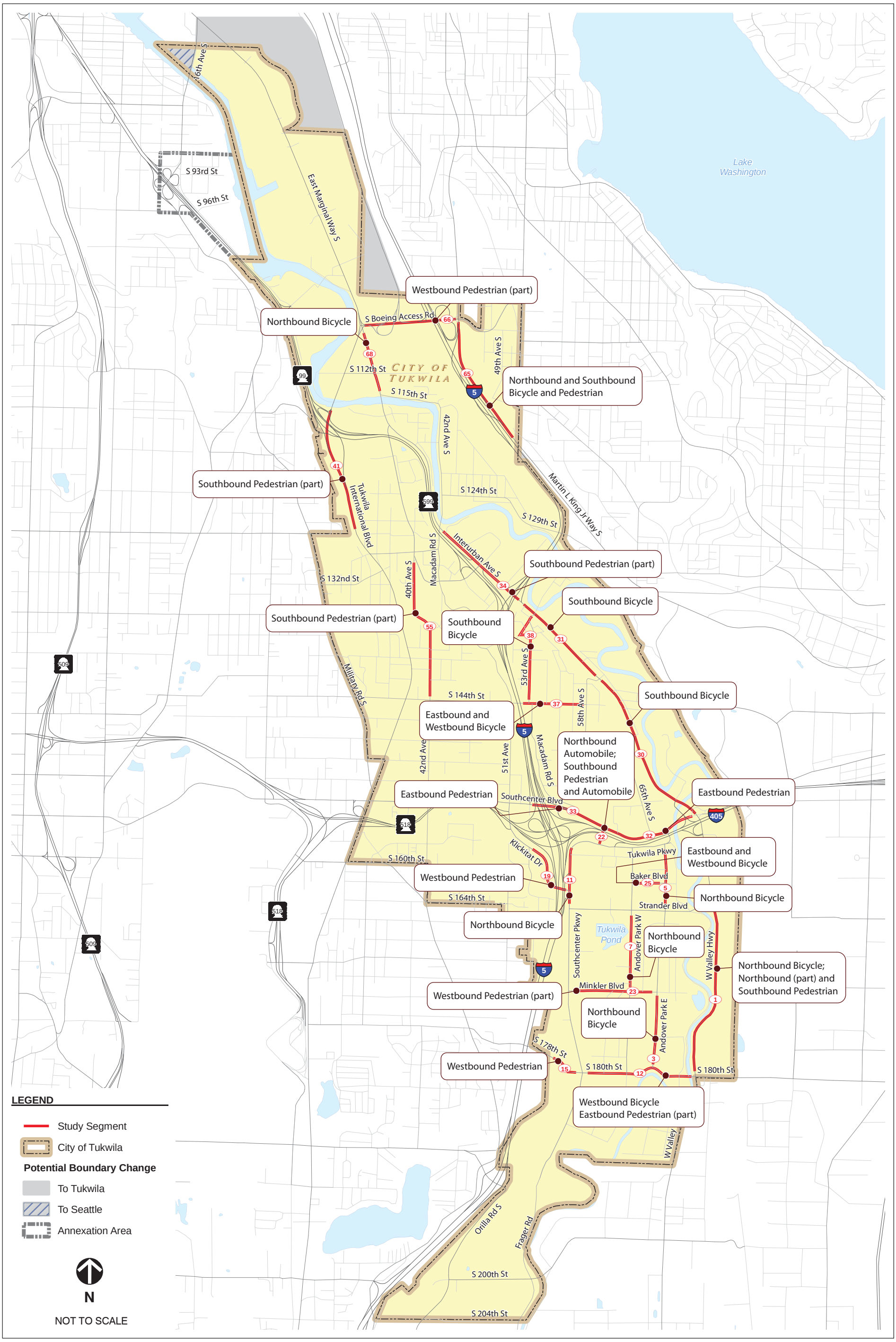
LOS E/F SEGMENTS

For the purposes of this study, segments in the City of Tukwila receiving an LOS of either E or F were considered to be performing poorly. The poorly performing segments and modes are summarized in Table 2 and shown in Figure 8.

TABLE 2 – LOS E/F SEGMENTS

Segment (Direction)	From	To	Auto LOS	Bike LOS	Pedestrian LOS
West Valley Highway (NB)	S 180th Street	Strander Boulevard		X	X
West Valley Highway (SB)	Strander Boulevard	S 180th Street			X
Andover Park East (NB)	S 180th Street	Minkler Boulevard		X	
Andover Park East (NB)	Strander Boulevard	Tukwila Parkway		X	
Andover Park West (NB)	Minkler Boulevard	Strander Boulevard		X	
Southcenter Parkway (NB)	Strander Boulevard	Northwest Mall Entrance		X	
S 180th Street (WB)	West Valley Highway	Southcenter Parkway		X	
S 180th Street (EB)	West Valley Highway	Southcenter Parkway			X
Klickitat Drive (EB)	53rd Avenue S	Southcenter Parkway			X
61st Avenue S (SB)	Southcenter Parkway	Southcenter Boulevard	X		
61st Avenue S (NB)	Southcenter Boulevard	Southcenter Parkway	X		X
Interurban Avenue S (SB)	58th Avenue S	Southcenter Boulevard		X	
Interurban Avenue S (SB)	I-5 NB On-Ramp	58th Avenue S		X	
Interurban Avenue S (SB)	Macadam Rd S	I-5 NB On-Ramp			X
Southcenter Boulevard (EB)	I-5 SB Off-Ramp	61st Avenue S			X
Southcenter Boulevard (EB)	61st Avenue S	West Valley Hwy			X
S 144th Street (EB & WB)	East End of I-5 Overpass	58th Avenue S		X	
53rd Avenue S/ 137th Street/52nd Avenue S (SB)	Interurban Avenue S	S 144th Street		X	
Martin Luther King Jr. Way (NB & SB)	East City Limit	North City Limit		X	X
40th Avenue S (SB)	East Marginal Way	42nd Avenue S			X
Baker Boulevard (EB & WB)	Andover Park West	Andover Park East		X	
Tukwila International Boulevard (SB)	Green River	SR-599 Ramp			X
S 178th Street (WB)	Southcenter Parkway	West City Limit			X
Boeing Access Road (WB)	Martin Luther King Jr. Way	East Marginal Way S			X
East Marginal Way S (NB)	S 115th Street	Boeing Access Road		X	

Source: Fehr & Peers, 2011



FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\zone_maps\MidSat\full\fig08_los_allZones_E-F_Segs.mxd

CITY OF TUKWILA -
STUDY SEGMENTS WITH A BICYCLE, PEDESTRIAN OR AUTOMOBILE LEVEL OF SERVICE OF 'E' OR 'F'

FIGURE 8

CHAPTER 4. RECOMMENDATIONS

Listed below are a series of preliminary improvement recommendations for each LOS E/F segment.

AUTO LOS E/F

Southbound 61st Avenue S from Southcenter Boulevard to Tukwila Parkway

Currently, the southbound segment of 61st Avenue S has an auto LOS of E. Due to the short distance of this segment and the traffic signal delay at the Tukwila Parkway / 61st Avenue S intersection, the segment has a relatively high number of stops per mile. The number of stops per mile is the most influential variable in calculating auto LOS, so this high value translates into poor auto LOS. Field observations confirm the poor auto LOS findings and indicate that heavy turning movements at the Southcenter Boulevard / 61st Avenue S and Tukwila Parkway / 61st Avenue S intersections cause long queues to form on eastbound Southcenter Boulevard and southbound 61st Avenue S.

In order to relieve some of the queuing that is forming along the southbound 61st Avenue S segment and improve traffic progression on this segment, the traffic signal timing could be improved to coordinate the eastbound right turn movement from Southcenter Boulevard and the southbound left turn movement from 61st Avenue S to Tukwila Parkway. By coordinating these two movements, the average number of stops per mile on the southbound 61st Avenue S segment would be reduced and the auto LOS would improve.

Since changing traffic signal timings could impact the progression on Southcenter Boulevard and Tukwila Parkway, a larger coordinated signal study focusing on both of these corridors should be conducted.

Northbound 61st Avenue S from Tukwila Parkway to Southcenter Boulevard

The auto LOS for the northbound segment of 61st Avenue S is E. Similar to the southbound segment, poor auto LOS is caused by heavy traffic volumes and closely spaced traffic signals that do not favor progression along 61st Avenue S. The auto LOS for this segment could be improved in one of two ways.

1) The 61st Avenue S Bridge could be widened to include three northbound lanes, which would increase the queue storage capacity of the northbound segment and increase the capacity of the Southcenter Boulevard / 61st Avenue S intersection.

2) Traffic signal coordination could be improved at the Southcenter Boulevard / 61st Avenue S and Tukwila Parkway / 61st Avenue intersections to favor northbound and southbound movements across the 61st Avenue S bridge. The progression for the movement along this segment is poor, as vehicles moving north through the Tukwila Parkway / 61st Avenue S intersection are usually met with a red signal at the Southcenter Boulevard / 61st Avenue S intersection. Coordinating this heavy movement could decrease delay through the segment and improve the auto LOS. As described above, any traffic signal coordination adjustments along 61st Avenue S would require a larger coordinated signal study focusing on the Southcenter Boulevard and Tukwila Parkway corridors.

BICYCLE LOS E/F

Northbound West Valley Highway from S 180th Street to Strander Boulevard

The bicycle LOS along this segment is E. The poor LOS can be attributed to relatively high vehicle speeds and high traffic volumes along with narrow travel lanes and a narrow shoulder. A relatively high percentage of heavy vehicles (16 percent) were also observed on the segment.

Given that West Valley Highway is a major north/south arterial through the City of Tukwila, carrying over 1,200 northbound vehicles during the PM peak hour, a reduction of vehicle capacity in order to accommodate bike lanes is not recommend. Providing additional bicycle capacity through right-of-way acquisition may be difficult as the Green River borders the segment to the west and several businesses border the segment to the east.

Therefore, we recommend that cyclists seeking a northbound or southbound route through this corridor be directed to the Interurban Trail or Green River Trail. Both trails are dedicated bike paths with no vehicular traffic. The Interurban Trail, located east of West Valley Highway is a direct and level route with very few vehicle conflicts. The Green River Trial, located west of West Valley Highway, meanders along the bank of its namesake river and provides a less direct but more scenic option than either West Valley Highway or the Interurban Trail. The Green River Trail is a good option for recreational cyclists who are less concerned with minimizing distance or travel time. No action is recommended for this segment as sufficient parallel bicycle routes exist.

Northbound Andover Park E from S 180th Street to Minkler Boulevard

The bicycle LOS for this segment is E. This poor bicycle LOS is a result of narrow vehicle lanes with no shoulders and a large number of unsignalized conflict points along the corridor. Field observations indicate that many on the businesses along the roadway have multiple driveways accessing Andover Park E.

Bicycle and pedestrian LOS could be improved along this corridor by reducing the number of lanes from four to three, which is commonly known as a “road diet.” The road would be restriped to include one through lane in each direction with a center two-way left turn lane. The remaining roadway width would be restriped to create a bicycle lane in each direction. With average daily traffic volumes along this segment under 10,000 vehicles per day, this three-lane configuration would provide adequate capacity to provide auto LOS of D or better.

In addition to the road diet, we also recommend that an access consolidation study be considered to determine the feasibility of reducing the number of driveways along the corridor. Fewer driveways will reduce the number of unsignalized conflicts, which will improve bicycle LOS. In addition, fewer driveways and a three-lane roadway configuration will provide the opportunity to create landscaped medians, improving the aesthetic quality of the roadway.

Northbound Andover Park E from Strander Boulevard to Tukwila Parkway

The bicycle LOS for this segment of Andover Park E is E. Along this segment, high vehicular volumes, the lack of a shoulder, and a large number of unsignalized conflicts cause the poor LOS.

Consolidating driveway access will lead to an improved bicycle LOS. Several businesses on the east side of the segment have multiple driveways. Reducing access points to one per business would improve the bicycle LOS from E to D.

Bicycle LOS on this corridor could also be improved from E to C with a road diet. However, the average daily traffic volume along this segment is over 13,000 vehicles per day, which could result in a negative impact on auto LOS unless additional lanes are provided at key intersections like at Baker Boulevard and Strander Boulevard. Although road diets along corridors with similar traffic volumes have been successfully implemented in other areas, further studies on this corridor should be considered prior to implementing a lane reduction.

Northbound Andover Park W from Minkler Boulevard to Strander Boulevard

Limited space for cyclists on this four-lane roadway with no shoulders and heavy traffic volumes results in a bicycle LOS of E. The segment also includes a large number of unsignalized conflicts that exacerbate the poor LOS.

Driveway consolidation could be considered as part of a bicycle LOS improvement plan for the corridor. Many businesses along the corridor have multiple access points that could potentially be removed; however an access study is recommended to determine the feasibility of reducing the number of driveways.

A road diet could also improve the bicycle LOS along the corridor. Although this segment serves a relatively high traffic volume (over 13,000 vehicles per day), benefits to pedestrians and cyclists along the corridor may outweigh any degradation in auto LOS. The City should consider further studying the impact of a road diet on this segment, potentially in conjunction with the road diet analysis for Andover Park E between S 180th Street and Tukwila Parkway.

Northbound Southcenter Parkway from Strander Boulevard to Northwest Southcenter Mall Entrance

The NCHRP 3-70 methodology does not accurately reflect the T-intersection geometry along this segment (see Attachment B). However, based on field observations, we estimate that this segment has a bicycle LOS of E. We based the poor LOS on the heavy traffic volumes, lack of shoulders or bike lanes, and the proportion of heavy vehicles traveling on the segment (8.2 percent).

As the Klickitat Drive / Southcenter Boulevard intersection will soon undergo reconstruction, we are recommending that no pedestrian or bicycle improvements be implemented along this segment. Cyclists should seek alternate routes such as Andover Park W.

Westbound S 180th Street from West Valley Highway to Southcenter Parkway

The bicycle LOS for westbound S 180th Street is currently E. High vehicle volumes along with the lack of bicycle facilities such as shoulders or bike lanes lead to the poor LOS.

The bicycle LOS could be improved along this segment by widening the street to provide bicycle lanes; however, businesses and the Green River levee could make any roadway widening costly and technically challenging. Heavy traffic volumes and complex geometric configurations (long crossing distances, dual right turn lanes) at the S 180th Street / Southcenter Parkway and S 180th Street / West Valley Highway intersections also limit the ability to improve bicycle LOS along this segment.

Given the proposed development in the Tukwila South Project area (along Southcenter Parkway, south of S 180th Street), future traffic volumes on S 180th Street will increase, which will further degrade the bicycle, pedestrian, and auto LOS of this corridor. To address the transportation challenges along this segment, a full multimodal access study should be prepared as part of the ongoing Transportation Element update. This multimodal study should consider a variety of enhancements including additional roadway capacity and the development of a parallel pedestrian and bicycle facility.

Southbound Interurban Avenue S from 58th Avenue S to Southcenter Boulevard

The Bicycle LOS for this segment is currently F. Heavy vehicle volumes, a high proportion of trucks, and narrow shoulders are the main factors leading to the poor LOS result. The two intersections analyzed for this segment (Southbound I-405 ramps and Grady Way/Southcenter Boulevard) also contributed to the poor LOS because of the long crossing distances.

Without increasing the width of the roadway, improving the bicycle LOS of the segment is not feasible in the near-term. Considering the high vehicle volumes, a road diet is not recommended in this location. While the Green River Trail parallels this segment, its circuitous routing may be unattractive to commuting cyclists. Cyclists traveling on this corridor increase their trip by over one mile when using the Green River Trail as an alternate route. As part of the Transportation Element update, the feasibility of a long-term strategy to add bike lanes and improve bicycle LOS on this facility should be explored.

Southbound Interurban Avenue S from I-5 NB On-ramp to 58th Avenue S

The bicycle LOS for this segment is currently E. As with the previous segment, high traffic volumes, a high percentage of heavy vehicles, and a lack of shoulders or bicycle lanes are the primary factors contributing to the poor LOS. The segment also has a high number of unsignalized driveways and intersections.

Without increasing the width of the roadway, improving the bicycle LOS of the segment is not feasible. However, the Green River Trail, a non-motorized recreational path, parallels Interurban Avenue along the east side of the road. Cyclists can use the Green River Trail as viable alternate route as it adds no additional distance to their route. To better direct southbound cyclists the Green River Trail, we recommend providing directional signs, potentially at the Interurban Avenue / 48th Avenue S intersection.

Eastbound and Westbound S 144th Street between the I-5 Overpass and 58th Avenue S

These eastbound and westbound segments have a bicycle LOS of E due to poor pavement quality. The city should consider repaving this street. With better pavement quality, these segments would have a bicycle LOS of B.

Southbound 53rd Avenue S / 137th Street / 52nd Avenue S from Interurban Avenue S to S 144th Street

This segment has a bicycle LOS of E due to poor pavement quality. The city should consider repaving this street. With better pavement quality, this segment would have a bicycle LOS of B.

Northbound and Southbound Martin Luther King Jr. Way between the East City Limit and the North City Limit

Martin Luther King Jr. Way has a deficient LOS in both directions for both bicycle and pedestrian modes. The segment, which is located between the Martin Luther King Jr. Way / Boeing Access Road intersection and Tukwila"s east city limit, is a limited access highway designed with no bicycle or pedestrian amenities. Providing pedestrian and bicycle facilities along Martin Luther King Jr. Way would require coordination between municipalities. As no businesses or pedestrian or bicycle attractions exist along either side of this segment, no action is recommended at this time.

Northbound East Marginal Way S from S 115th Street to Boeing Access Rd

The bicycle LOS of northbound East Marginal Way between S 115th Street and Boeing Access Road is E. Although this segment has wide shoulders conducive to cyclists, the segment also has a large number of driveways conflicts. These driveway conflicts are responsible for the poor segment LOS.

The City should consider working with the business along the east side of the East Marginal Way to develop an access management strategy. The LOS of this segment would significantly improve with the consolidation of these driveways.

Eastbound and Westbound Baker Boulevard from Andover Park West to Andover Park East

Both eastbound and westbound Baker Boulevard received a Bicycle LOS of F. This poor LOS can be attributed to the lack of a shoulder or bike lane and a high unsignalized conflicts per mile value. With average daily traffic volume well below 10,000, the City should consider studying a 4 to 3 lane conversion or road diet. This would enable bicycle lanes to be placed on either side on the street, improving the bicycle LOS without significantly impacting traffic operations. The City should also consider driveway consolidation as part of their bicycle LOS improvement plan as businesses along the corridor have multiple access points.

PEDESTRIAN LOS E/F

Westbound Klickitat Drive from Southcenter Parkway to 53rd Avenue S

Westbound Klickitat Drive currently has a pedestrian LOS of E. The poor pedestrian LOS is related to the lack of sidewalks and relatively high traffic volumes. It is recommended that no action be taken on improving the pedestrian LOS for this segment as the parallel pedestrian walkway just south of the segment provides adequate pedestrian service.

Southbound 61st Avenue S from Southcenter Boulevard to Tukwila Parkway

The pedestrian LOS for this segment was determined to be E. No pedestrian facilities currently exist along this portion of 61st Avenue S. With no separation between the pedestrian and the travel lanes, along with heavy vehicle volumes, a lack of crosswalks, and multiple turning lanes, pedestrian travel on the west side of the 61st Avenue S bridge is difficult and potentially hazardous.

With heavy vehicle volumes along the segment, reconfiguring the roadway geometry to provide a sidewalk is impractical. In the near-term, pedestrians should be urged to use the sidewalk on the east side of the bridge. Without the modification of the bridge to provide sidewalks or the construction of a new, wider bridge, pedestrian LOS cannot be improved along this segment.

Eastbound Southcenter Boulevard from I-5 SB Off-ramp to West Valley Hwy

Calculations for the sub-segments along this section of roadway yield pedestrian LOS results of C and D. However, after further analyzing this portion of Southcenter Boulevard, engineering judgment leads us to believe this segment should fall into the E/F range. With heavy vehicle volumes along Southcenter Boulevard and no sidewalk present along the majority of the segment, little pedestrian service is provided. The pedestrian LOS could be improved by installing a sidewalk along the south side of Southcenter Boulevard. However, given the lack of businesses or other pedestrian attractions, and the proximity of I-405 on this side of the street, it is reasonable to direct pedestrians to use the sidewalk on the north side of Southcenter Boulevard. We also recommend that the narrow pedestrian path on the south side of Southcenter Boulevard between 61st Avenue S and 62nd Avenue S be rebuilt to meet City of Tukwila sidewalk standards. This improved sidewalk will provide better access to the eastbound bus stop located east of 61st Avenue S.

Westbound Boeing Access Rd from I-5 Off-ramp to East Marginal Way S

The pedestrian LOS along the westbound direction of Boeing Access Road is E. This segment has no sidewalk and requires pedestrians to cross five high-speed ramps accessing I-5, Airport Way, and East Marginal Way. The addition of sidewalks and crosswalks along this segment would improve pedestrian LOS. While the City's CIP address the replacement of the BNRR Bridge including sidewalks on both sides, it is being recommended that sidewalks also be placed along the entirety of the segment from the East Marginal Way intersection to the Martin Luther King Way intersection.

Northbound and Southbound Martin Luther King Jr. Way between the East City Limit and the North City Limit

Martin Luther King Jr. Way is a limited access highway designed solely for vehicle use. Pedestrians traveling along this corridor should seek alternate routes. As little to no pedestrian attractions, such as recreational areas or businesses, are located along this corridor, no action is being recommended.

Southbound Tukwila International Boulevard from Green River to SR 99 / SR 599 Ramps

Pedestrian LOS along this segment of Tukwila International Boulevard is E. Pedestrians traveling through this segment have no sidewalk and face relatively long crossing lengths at intersections due to the SR 99 / SR 599 ramp designs. Improvements at this location could include adding a sidewalk or reducing pedestrian crossing lengths by providing crosswalks perpendicular to the flow of traffic on ramps.

Southbound Interurban Avenue S from Macadam Rd to I-5 Northbound On-ramp (part)

A pedestrian LOS of E was calculated along this corridor. The segment contains no sidewalks as shrubs and trees occupy the side of the street, effectively prohibiting pedestrian travel. As no pedestrian attractions occupy this side of the street and the adjacent land serves as a drainage basin, widening the right-of-way for the placement of a sidewalk is unreasonable. Pedestrians should be advised to use the opposite side of the street. No action is recommended at this time.

Southbound 40th Avenue S from S 130th St to 42nd Avenue S (part)

This section of 40th Avenue S received a pedestrian LOS of E. Lack of continuous sidewalks and a narrow shoulder are responsible for the poor rating. As only a large shoulder is present on the opposite, northbound side of the street, it is recommended that the sidewalk on the southbound side of the street be extended northward to S 130th St creating a continuous pedestrian facility to serve the local residential neighborhood.

Westbound Minkler Boulevard from Andover Park East to Andover Park West

This section of Minkler Boulevard received a pedestrian LOS of E. Neither the north nor south sides of the street have sidewalks as the relatively heavy traffic volumes occupy the corridor. The north side of the street has several small sections of sidewalk, but the presence of the railroad tracks causes discontinuities at several locations. While a drainage basin occupies the southern side of the street, it is recommended that a continuous sidewalk be constructed on the north side to improve pedestrian LOS.

Northbound and Southbound West Valley Highway from Strander Boulevard to S 180th St

The entire southbound side of West Valley Highway from Strander Boulevard to S 180th St received a pedestrian LOS of E. Pedestrians on this side of the street are faced with high vehicular volumes and speeds without the safety of a sidewalk. As much of this section is bordered by the Green River and few pedestrian destinations, no action is being recommended for the southbound side of West Valley Highway. Pedestrians should be encouraged to use the opposite side of the street or either the Interurban Trail or Green River Trail which parallel the segment.

One section of the West Valley Highway northbound from S 180th to Strander Boulevard received a pedestrian LOS of E. This stretch, from approximately the businesses of Leavitt Machinery and Forklift Parts to SimpleFloors Seattle, is the single northbound section that does not have a sidewalk. It is recommended that a sidewalk be constructed for this section to provide a continuous pedestrian facility on one side of West Valley Highway.

Westbound S 178th St from Southcenter Parkway to West City Line

S 178th St westbound received an LOS of E. This calculation was based on the segment LOS rating only as no downstream intersection was present. The poor LOS can be attributed to the high vehicle volumes and lack of sidewalk. According to the methodology used for the LOS calculation, the segment also experienced high vehicular speeds. Because the methodology does not take into account grade and this

segment has a severe slope, the average running speed may be overestimated. It is recommended that a sidewalk be considered for this corridor to increase pedestrian service. The speed limit could also be reduced to improve LOS.

Eastbound S 180th St from Sperry Drive to West Valley Highway

See recommendation for corridor in **Bicycle LOS E/F** section**.**

NEXT STEPS

In addition to this MMLOS analysis, we will work with staff to establish MMLOS policies to balance deficiencies and improvement measures for different modes. These MMLOS policies will establish clear guidance on which modes receive priority when improvement measures result in LOS degradation for different modes. These policy issues will be discussed as part of the Transportation Element Update.

ATTACHMENT A:
SUMMARY OF DATA SOURCES

TRAFFIC DATA

Several pieces of data used in the MMLOS calculations were taken from turning movement counts collected at intersections throughout the City of Tukwila. These counts were taken on weekdays during June and July, 2010. Traffic data extracted from the turning movement counts included peak hour factor (PHF) and peak hour roadway segment volumes.

HEAVY VEHICLES

The heavy vehicle percentages used in the bicycle LOS calculation were taken from 2010 vehicle classification counts collected by the City along key corridors. In locations where vehicle classification counts were not available, heavy vehicle percentages were estimated from the turning movement counts described above. In locations where neither vehicle classification counts nor turning movement counts had been collected, heavy vehicle percentages from 2007 turning movement counts were used.

SYNCHRO DATA

The Synchro traffic LOS analysis software was used in several circumstances to calculate input data. These data included the volume-to-capacity ratio, the proportion of green time for an approach to an intersection, and the traffic signal vehicle control delay. The time-space diagram feature of Synchro was also used in determining the signal progression of several segments.

INTERSECTION AND ROADWAY GEOMETRIC FEATURES

Google Earth was used to measure the lengths and widths of the intersections and roadway segments. Although using Google Earth does not provide exact measurements, precise dimensions were not necessary for this methodology. Sensitivity tests completed on features such as sidewalk and lane width revealed the LOS for a given mode was insignificantly affected by increases or decreases of widths within a one-to-two foot range. Field observations at several locations were used to validate the Google Earth measurement approach.

PAVEMENT QUALITY

Data for the pavement quality of the study segments was provided by the City of Tukwila in the *Pavement Maintenance Management Program* report from 2008. In this report, city roadways were rated 0-100 based on the Pavement Engineers – Pavement Condition Rating (PE-PCR) system. As described earlier, the MMLOS methodology requires a 1-5 pavement rating system to calculate bicycle LOS. The 0-100 PE-PCR system was broken into five categories (0-20, 21-40, 41-60, 61-80, 81-100) which were simplified to the 1-5 MMLOS pavement quality rating scheme.

PERCENT OCCUPIED PARKING

The percentage of occupied parking was determined for segments with legal street parking. A field study was conducted where parked cars were counted along relevant study segments. We estimated the percentage of occupied parking using the following equation:

$$Percentage\ of\ occupied\ parking = \frac{(Number\ of\ parked\ cars\ on\ a\ segment * 20\ feet\ per\ parked\ car)}{Total\ length\ of\ parking\ area}$$

ATTACHMENT B:
DESCRIPTION OF ASSUMPTIONS

ANALYZING T-INTERSECTIONS

The analysis of T-intersections is not addressed in the MMLOS methodology of NCHRP Project 3-70. While the methodology allows for the analysis of movements crossing the intersection, there is no provision for calculating the pedestrian or bicycle LOS on the "top of the T." In other words, the NCHRP methodology does not give any guidance about the pedestrian or bicycle LOS for the side of the intersection with no roadway leg.

In these instances, the bicycle intersection crossing distance variable was given a value of 0 in the calculation. This approach basically rewards the intersection LOS for having no conflicting movements while continuing to analyze based on other variables. This approach was chosen because while the bicyclist is not faced with conflicting movements, there is still a negative impact to the cyclist"s level of service due to the presence of the intersection. For example the duration of time spent adjacent to vehicles and the decrease in comfort traveling through the intersection can all affect the bicycle LOS.

When analyzing pedestrian LOS through a signalized T intersection, an intersection LOS of A was assumed since the pedestrian faces no conflicts and the overall walking environment is similar to walking along the street between intersections. The LOS of A effectively removes the intersection from the pedestrian LOS calculation for segments with T intersections.

UNSIGNALIZED INTERSECTIONS

Unsignalized intersections are not addressed in the MMLOS methodology. The methodology used for bicycle and pedestrian intersection LOS is limited only to four-way signalized intersections. Therefore engineering judgment was used to describe the LOS for segments with unsignalized intersections; although these intersections were generally not considered to have any impact beyond the reduction in bicycle LOS associated with unsignalized conflict points.

RIGHT TURN ON RED (RTOR) VOLUMES

For the purposes of determining the pedestrian intersection LOS, several assumptions were made to determine the RTOR volume. For intersections where a right turning lane was present, 20 percent of the total right turning movement for the intersection was assumed to occur on the red light. For intersections where a shared through and right lane was present, 5 percent of the right turning volume was assumed to occur on the red light.

PERMITTED LEFT TURNS

In order to determine the permitted left turning volumes, which can conflict with the pedestrian movement, several assumptions were made. For protected only left turns (signals with red and green left turn arrows), a value of 0 percent was assumed. For approaches where left turns were permitted only, 100 percent of left turns were defined as potentially conflicting with pedestrian crossings. For approaches with permitted-protected left turn phasing (where a green arrow is initially given, followed by a permitted left turn phase), 20 percent of the total left turning movement was assumed to occur during the permitted (conflicting) phase.

PEDESTRIAN SUBSEGMENTS

In order to produce LOS results to the pedestrian scale, subsegments were created from the original segments. The MMLOS methodology was consequently broken as some of the subsegments did not begin and end at intersections. In these cases, the overall pedestrian LOS was determined solely by the segment LOS value and not a weighted average between segment and intersection LOS.

ATTACHMENT C:
NON-MOTORIZED CORRIDORS, EXISTING CONDITIONS

FEHR & PEERS
TRANSPORTATION CONSULTANTS

MEMORANDUM

Date: June 7, 2010 (Update)

To: Cyndy Knighton, City of Tukwila

From: Kendra Breiland and Tom Noguchi, Fehr & Peers

Subject: ***Deliverable #1: Non-Motorized Corridors, Existing Conditions, and Previously Identified Needs***

SE08-0181

The City of Tukwila has contracted with Fehr & Peers to develop a process for evaluating operations of bicycle and pedestrian facilities in the City. This analysis, which is funded by an Energy Efficiency in Transportation Planning grant from the Washington State Department of Commerce, will include measuring bicycle and pedestrian level of service (LOS) on the City's roadway network according to the newest procedures described in the draft 2010 Highway Capacity Manual (HCM). Defining bicycle and pedestrian LOS on key corridors throughout the City will inform the City's Comprehensive Transportation Plan Update as to which sorts of projects would most benefit bicycle and pedestrian travel in the City.

This memorandum summarizes the following:

- The City's existing bicycle and pedestrian facilities
- Projects that are currently being planned and constructed, as reflected in the 2010-2015 Capital Improvement Program (CIP)
- The "Bicycle Friendly Routes" that are identified in the City's Walk and Roll Plan
- The corridors that have been selected for bicycle and pedestrian LOS evaluation
- The data needs to evaluate bicycle and pedestrian LOS on each of the selected corridors
- Connection with the Comprehensive Plan Update process

Existing Bicycle and Pedestrian Facilities

In 2009, the City published a Walk and Roll Plan, which is Tukwila's key non-motorized transportation plan. Fehr & Peers has reviewed the Plan and summarized Tukwila's existing transportation network, including bicycle and pedestrian facilities along arterial roadways. The following types of transportation facilities were identified as accommodating non-motorized travel:

- Sidewalks
- Bike lanes
- Paved shoulders

Figure 1 summarizes the existing non-motorized facilities on arterials within the City. It is worthwhile to note that this map does not include the components of the City's non-motorized transportation network that are outside of the arterial roadways. These facilities include sidewalks along non-arterial roadways, unpaved paths that are used by pedestrians, and local roadways that are shared by autos and bikes.

Future Bicycle and Pedestrian Facilities

Fehr & Peers has reviewed the City's 2010-2015 CIP to determine the sorts of non-motorized facilities planned for construction in the next five years. As shown in Figure 2, the City plans to construct new sidewalks on roadways throughout the City, as well as a bike-pedestrian bridge over the Green River. Not shown on Figure 2 are a number of intersection signal enhancements and crosswalks included in the CIP, which may also benefit bicycle and pedestrian travel.

Beyond the 2010-2015 CIP, the City's Walk and Roll Plan designates "Bicycle Friendly Routes" and provides guidance to ensure that major transportation infrastructure projects include bicycle and pedestrian elements that are consistent with City's ultimate non-motorized system. The Plan's Bicycle Friendly Routes are shown in Figure 3 and are intended to provide a coordinated City bikeway system that connects parks, schools, major employers, transportation centers, neighboring cities, and other activity centers.

Bicycle and Pedestrian Level of Service Evaluation

To refine the Walk and Roll Plan and inform the City's Comprehensive Transportation Planning process, Fehr & Peers will be evaluating bike and pedestrian LOS on several key corridors throughout the City. Figure 4 shows the corridors that were identified by City staff. In general, these corridors overlap with the Bicycle Friendly Routes identified in the Walk and Role Plan, but also include some additional locations (particularly near the Southcenter Mall) to ensure that major bicycle and pedestrian needs are considered.

Traditionally, LOS analysis has focused on a single mode – the auto. However, as jurisdictions like Tukwila attempt to plan for the travel experience of non-auto modes, a singular focus on automobile operations provides an incomplete picture. Thus, the City has identified the need to measure bicycle and pedestrian LOS. Below, we describe how LOS is measured for each mode:

- **Autos:** Auto operations have traditionally been measured by volume to capacity (V/C) ratios on roadways and by delay experienced by vehicles at intersections. The 2010 HCM guidelines may enhance these capacity and delay-based metrics to consider factors like speed and stops per mile.

- **Bicycles:** Bicycle operations will consider the experience of cyclists at intersections and on street segments between intersections. Bicycle experience at intersections is measured by the physical space available for bicycles and the number of conflicting vehicles using the intersection. Bicycle experience on roadway segments will consider a number of factors, including vehicle composition, speed and volume, pavement quality, physical space allotted to cyclists, the presence of on-street parking, and the number of conflicts (driveways and intersections) cyclists encounter per mile.

- **Pedestrians:** Pedestrian LOS can be measured either based on density or non-density factors. Since overutilization of pedestrian facilities is not presently a concern for Tukwila, we will use non-density factors to measure pedestrian LOS. These factors

include physical separation of pedestrian and vehicle facilities (via on-street parking, bike lanes, planter strips, and other buffers), the speed of vehicle traffic, and the presence of sidewalks.

Measuring LOS for bicycles and pedestrians will require more data than analyses where vehicle operations are the sole focus. Below, we list the data required to reflect each mode:

- **Bicycle:** Bicycle operations analyses should include data on the number of conflicts cyclists face on a roadway segment (driveways and intersections), number of vehicle lanes, vehicle speeds, volumes and peaking characteristics, pavement quality, on-street parking utilization, the widths of the bicycle lane and outside vehicle lanes.

- **Pedestrian:** Pedestrian LOS analyses will assess the pedestrian environmental along roadway segments. Pedestrian segment LOS will require data on presence of sidewalks, width of outside vehicle lanes, barriers between pedestrians and vehicles (bike lanes, shoulders, on-street parking utilization, and other buffers), the continuity and width of sidewalks, vehicle speeds, volumes, and peaking factors.

The HCM 2010 guidelines will likely provide look-up tables and default values for many of the above data requirements. However, it is difficult to say the extent to which the default values would represent conditions in Tukwila. Thus, to accurately measure bicycle and pedestrian LOS on its transportation network, the City will begin collecting locally valid travel data for use in this analysis.

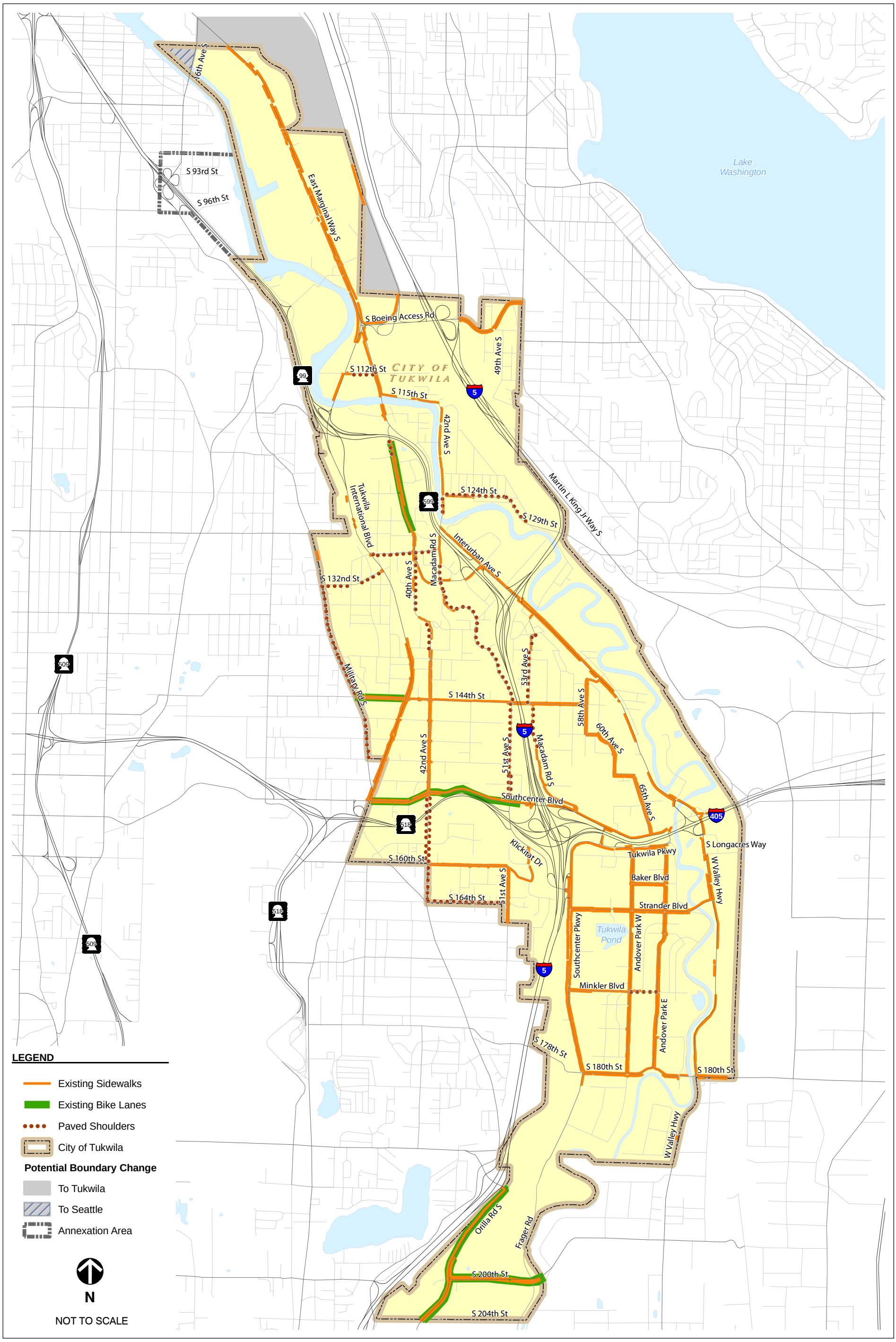
Connection with Comprehensive Plan Update Process

It is important to note that non-motorized travel is influenced by both the presence of bike and pedestrian facilities as well as the mix of adjacent land uses. Land use considerations include the type of land uses in place and whether they are conducive to non-motorized travel, as well as how close these land uses are to one another. As the City updates its Comprehensive Transportation Plan, we will be reviewing how the future land use plan will influence demand for non-motorized travel.

The work funded by this grant will provide the City with guidance as to how existing non-motorized facilities function. By pairing an understanding of the City's existing and planned land uses with how its current transportation system accommodates non-motorized modes, these efforts will provide the City with a better understanding of where bicycle and pedestrian facility improvements are needed.

Next Step

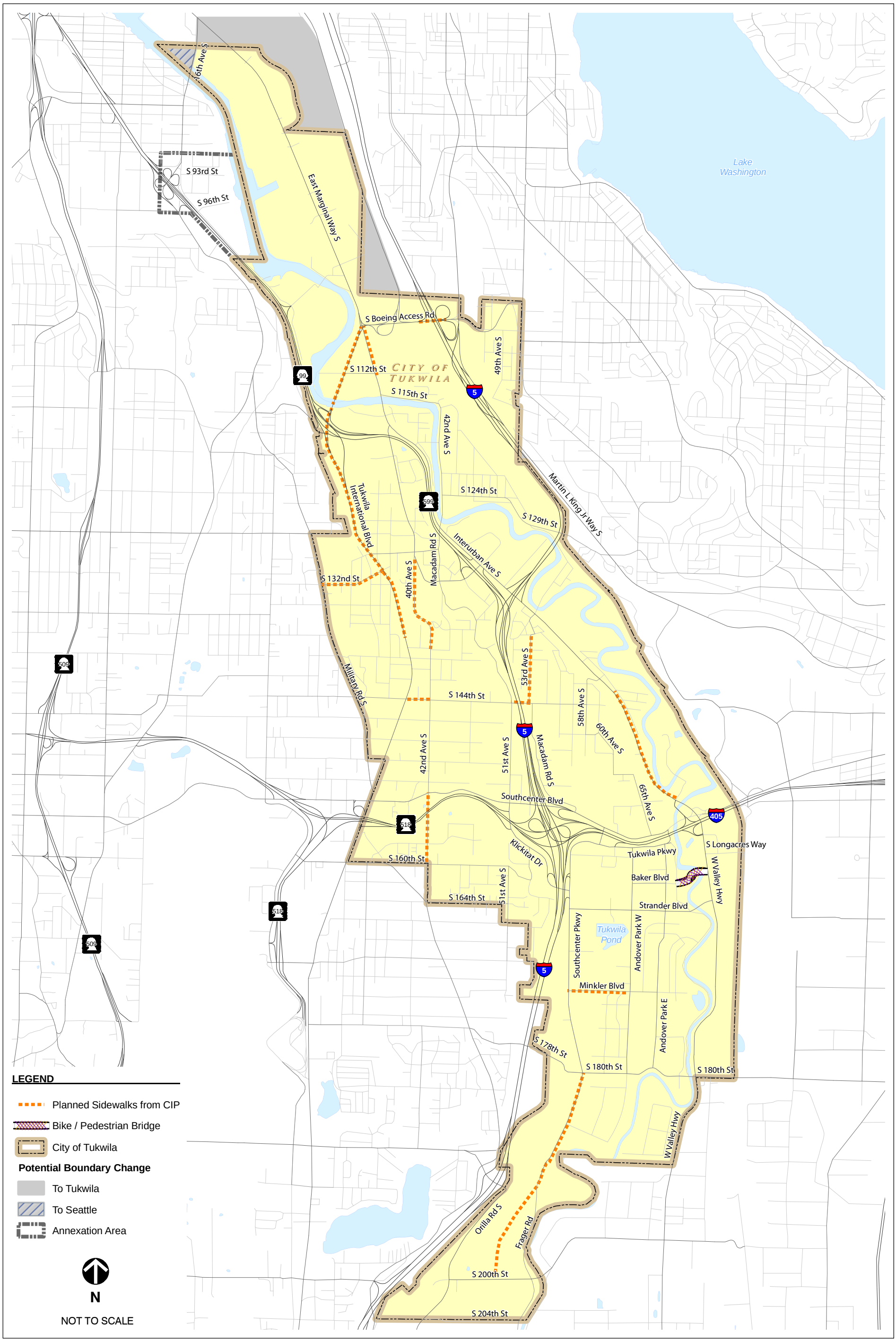
During the next phase, Fehr & Peers will collect the data and calculate auto, pedestrian, and bicycle levels of service for the arterial segments shown in Figure 4.



FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\fpse2\data2\2010Projects\SE10-0181.01_Tukwila PedBike LOS\Graphics\Draft\GIS\MXD\fig01_bike_side_sldrs2.mxd

CITY OF TUKWILA -
EXISTING PEDESTRIAN AND BICYCLE FACILITIES
FIGURE 1

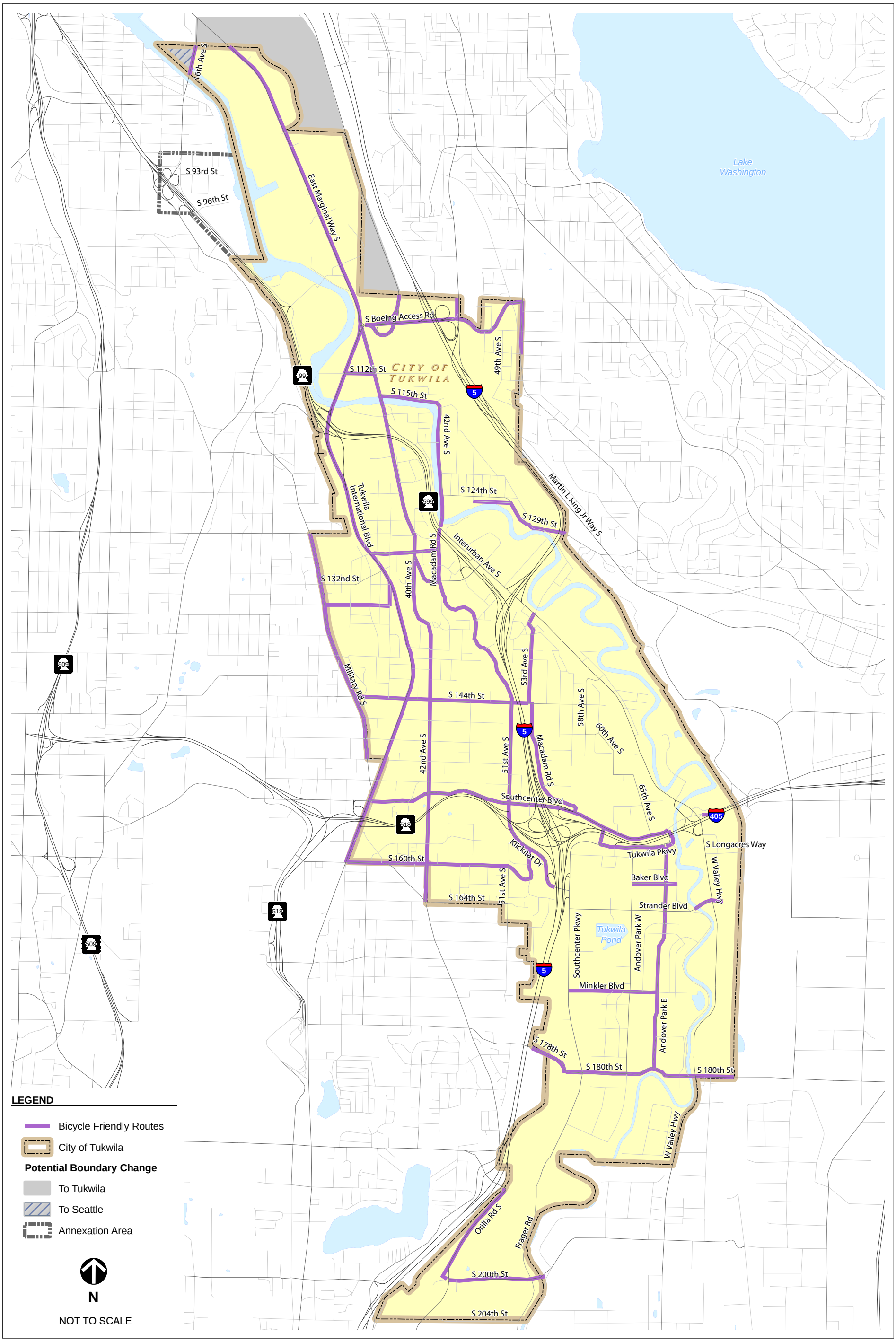


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\FPSE2\Data2\2010Projects\SE10-0181.01_Tukwila PedBike LOS\Graphics\Draft\GIS\MXD\fig02_plnd_side.mxd

CITY OF TUKWILA - PLANNED PEDESTRIAN FACILITIES

FIGURE 2

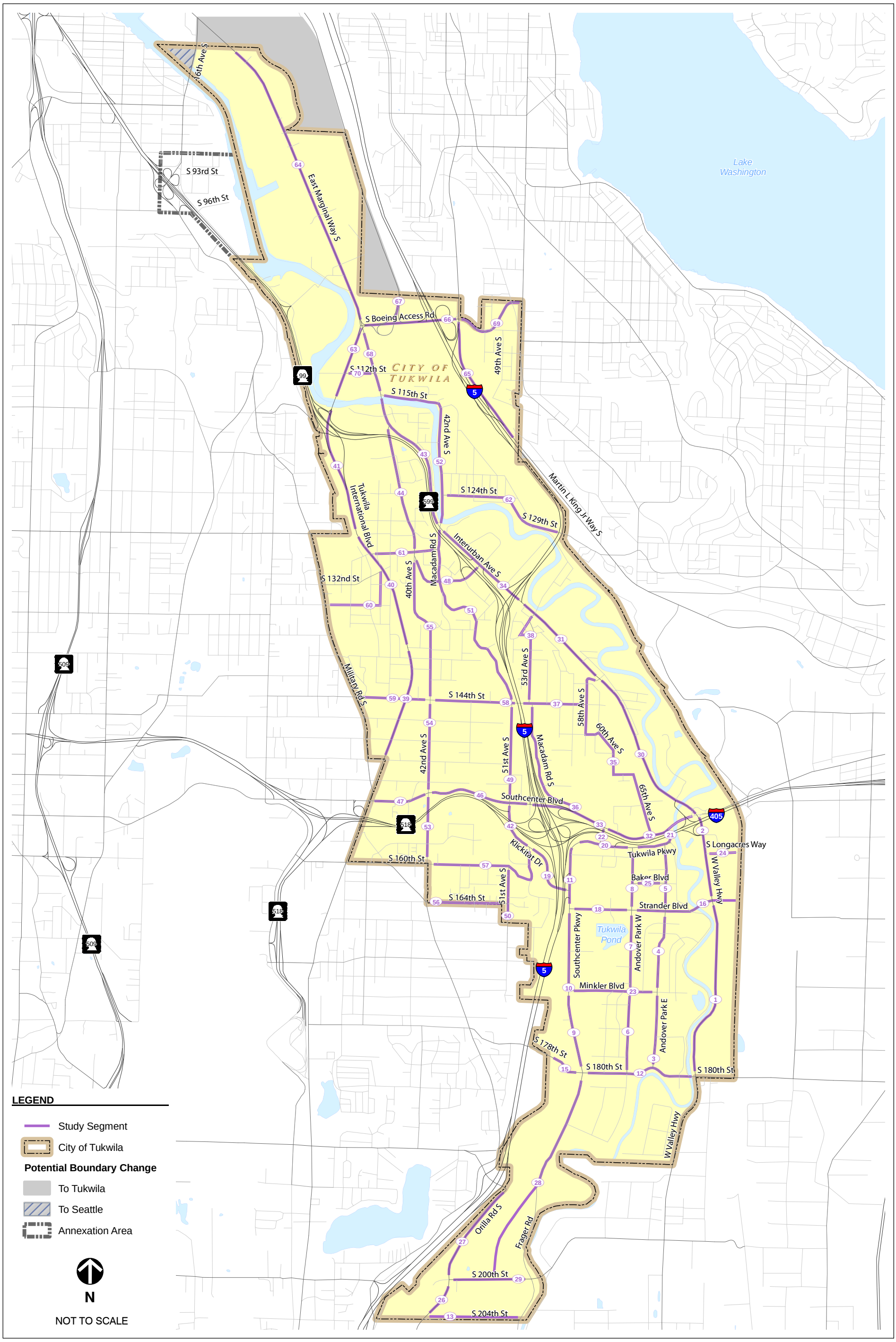


FEHR & PEERS
TRANSPORTATION CONSULTANTS

\\fpse2\data2\2010Projects\SE10-0181.01_Tukwila PedBike LOS\Graphics\Draft\GIS\MXD\fig03_bike_frd_routes.mxd

CITY OF TUKWILA - BICYCLE FRIENDLY ROUTES

FIGURE 3



FEHR & PEERS
TRANSPORTATION CONSULTANTS

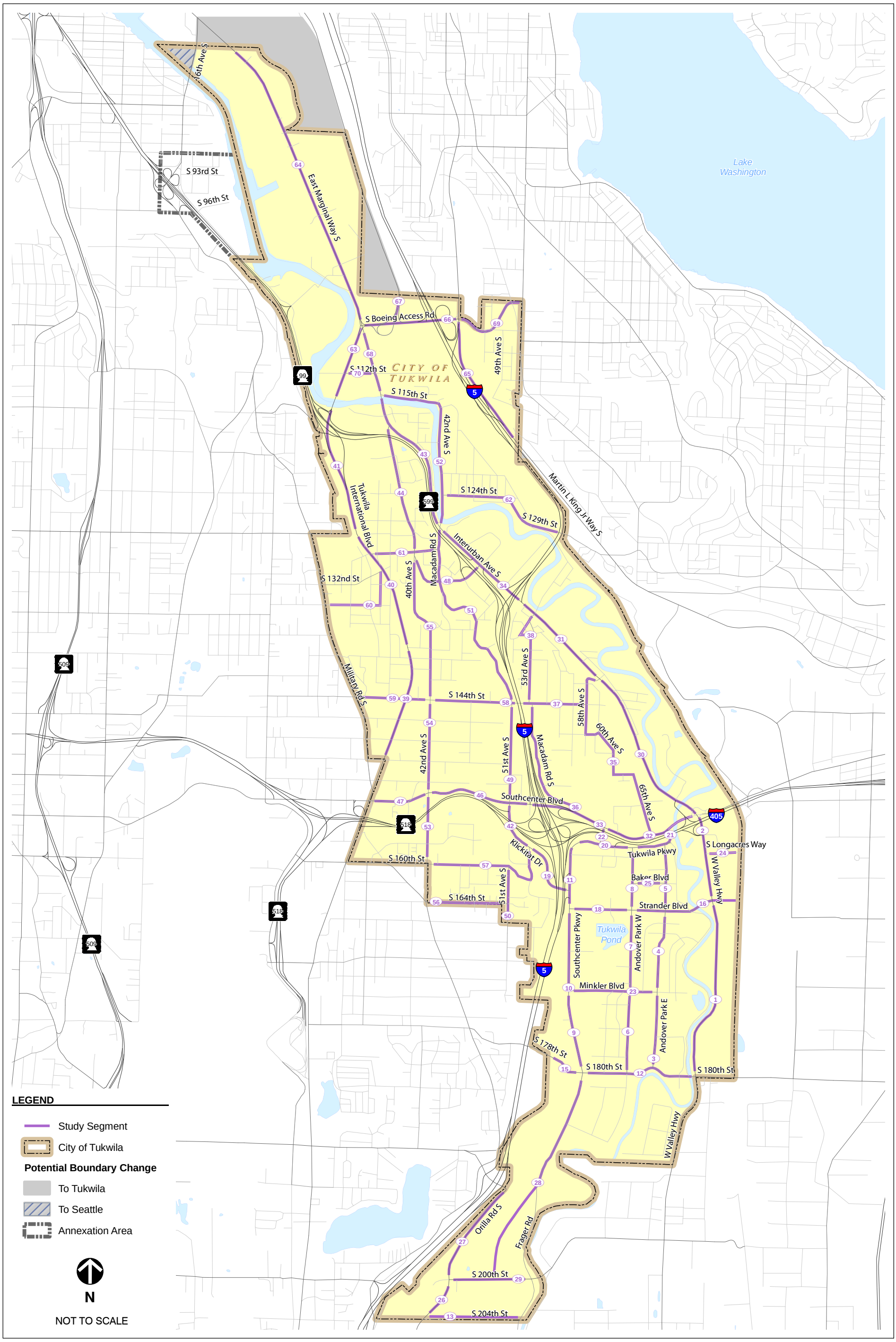
\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\fig04_studySegs.mxd

CITY OF TUKWILA - STUDY SEGMENTS

FIGURE 4

APPENDIX B:

PEDESTRIAN SEGMENT LOS RESULTS



FEHR & PEERS
TRANSPORTATION CONSULTANTS

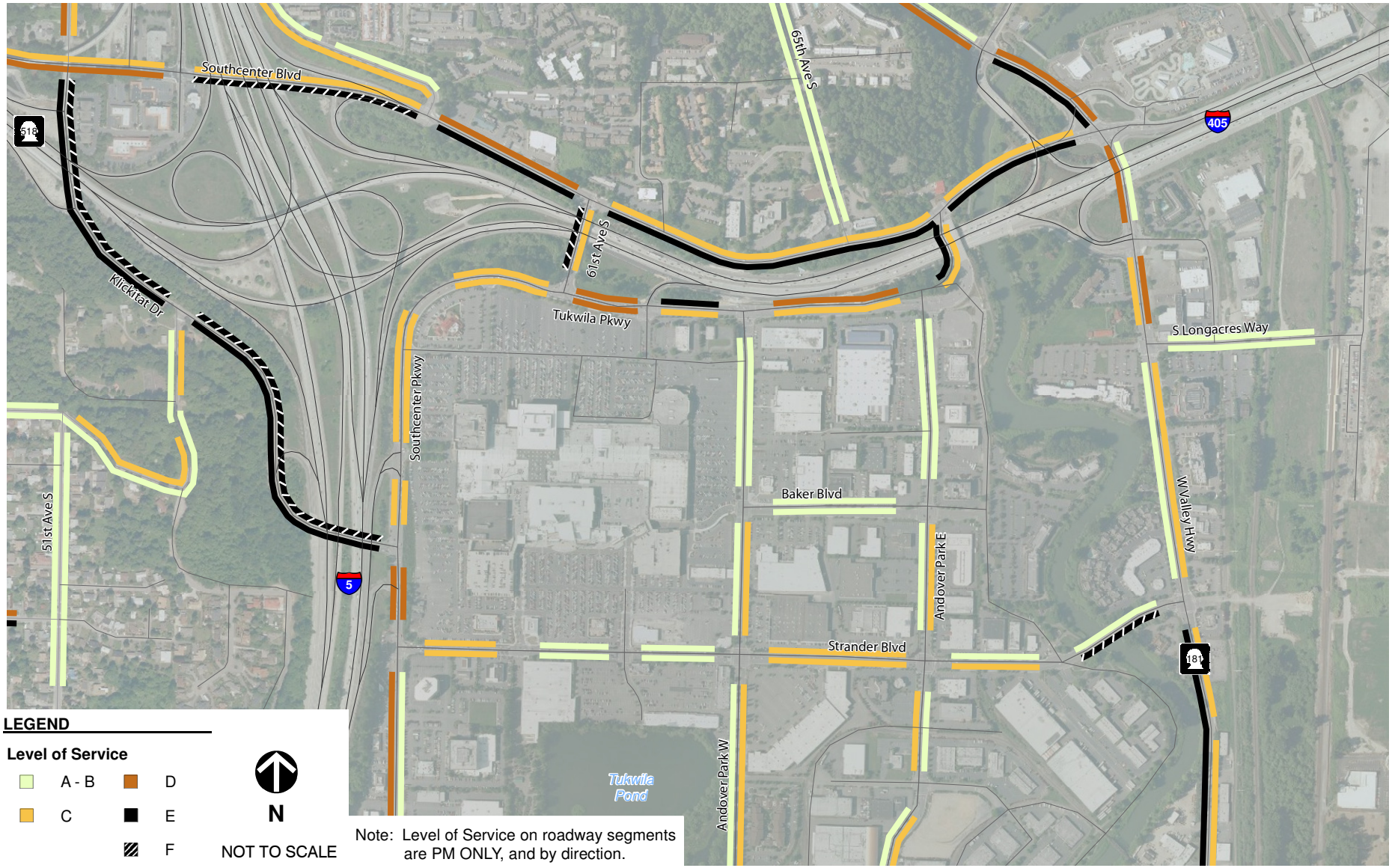
\\FPSE2\Data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\fig04_studySegs.mxd

CITY OF TUKWILA - STUDY SEGMENTS

FIGURE 4

APPENDIX B:

PEDESTRIAN SEGMENT LOS RESULTS

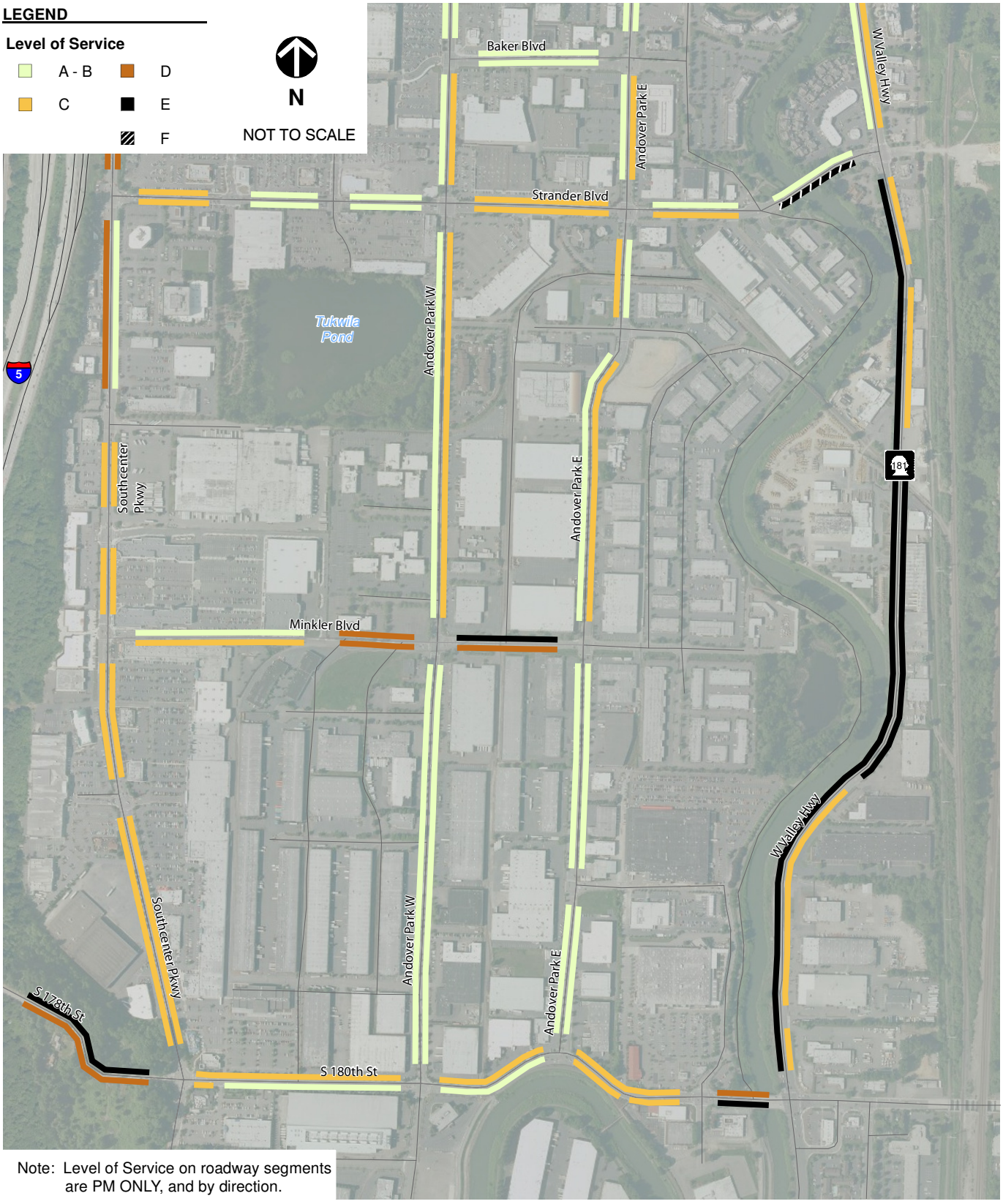


CITY OF TUKWILA - 2010 PEDESTRIAN SEGMENT-ONLY LEVEL OF SERVICE (SECTION 1)

FEHR & PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\figB-1_los_sec1_PED_hash.mxd

FIGURE B-1



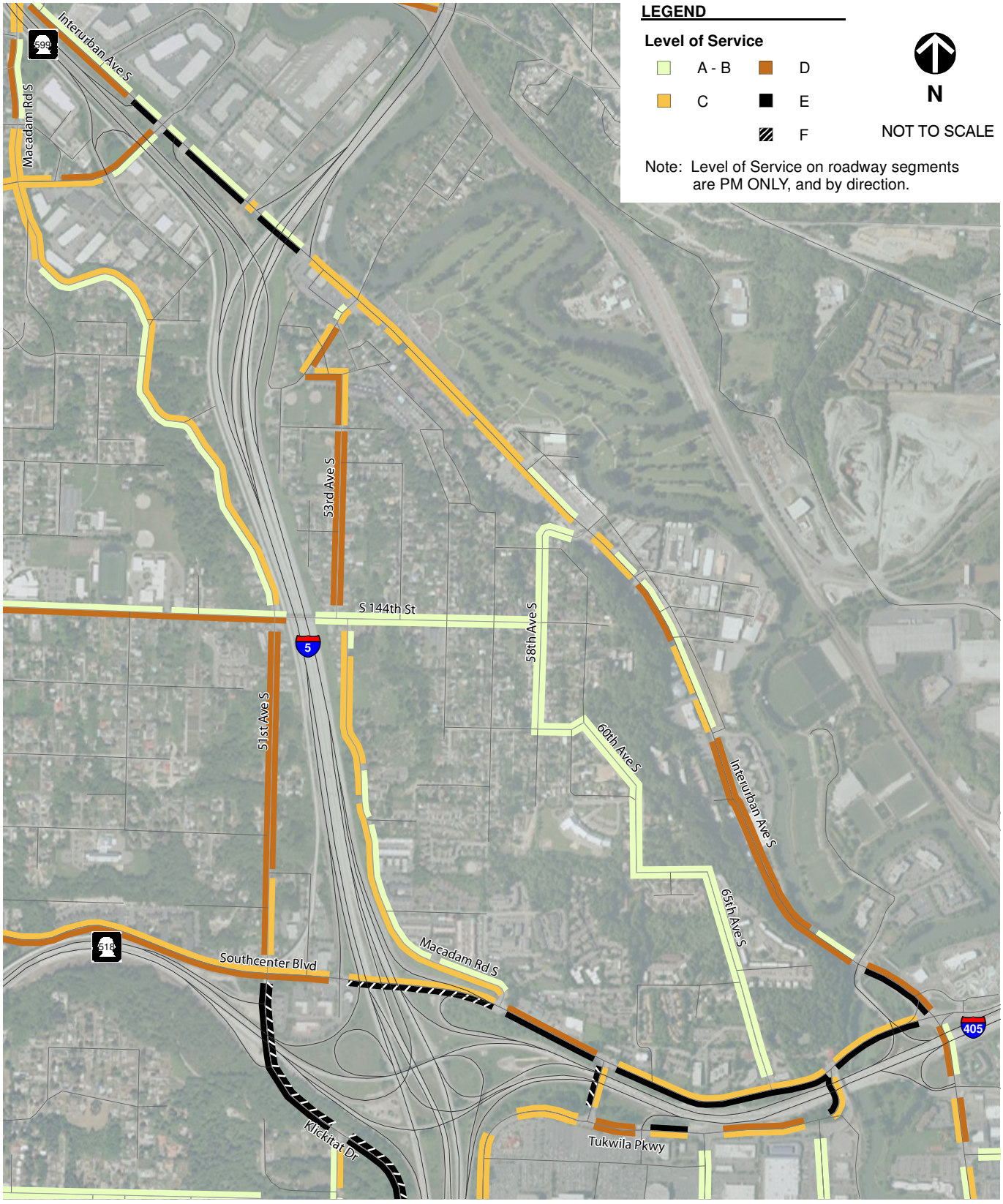
Note: Level of Service on roadway segments are PM ONLY, and by direction.

CITY OF TUKWILA -
2010 PEDESTRIAN SEGMENT-ONLY LEVEL OF SERVICE (SECTION 2)

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\figB-2_los_sec2_PED_hash.mxd

FIGURE B-2

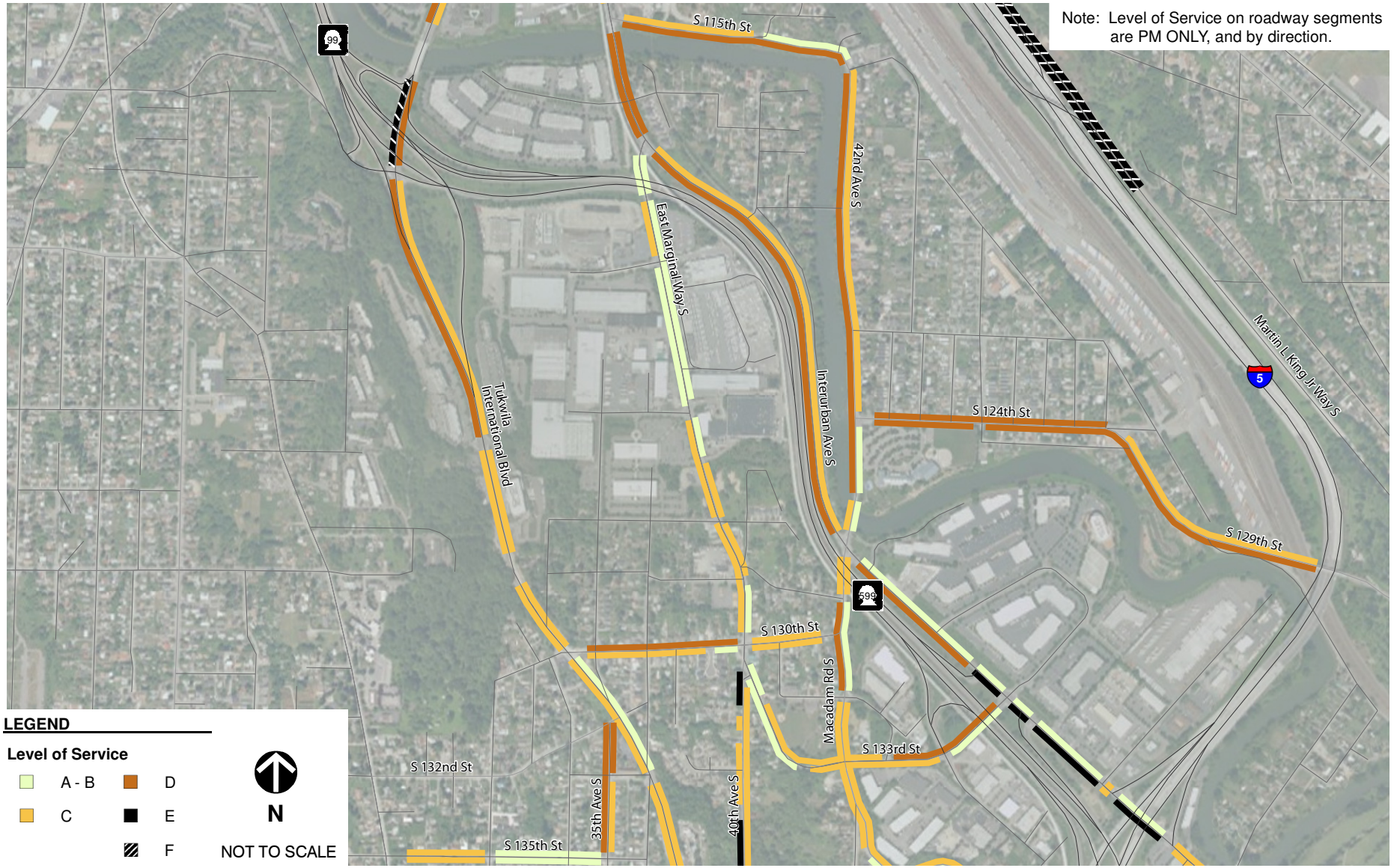


CITY OF TUKWILA -
2010 PEDESTRIAN SEGMENT-ONLY LEVEL OF SERVICE (SECTION 3)

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\figB-3_los_sec3_PED_hash.mxd

FIGURE B-3

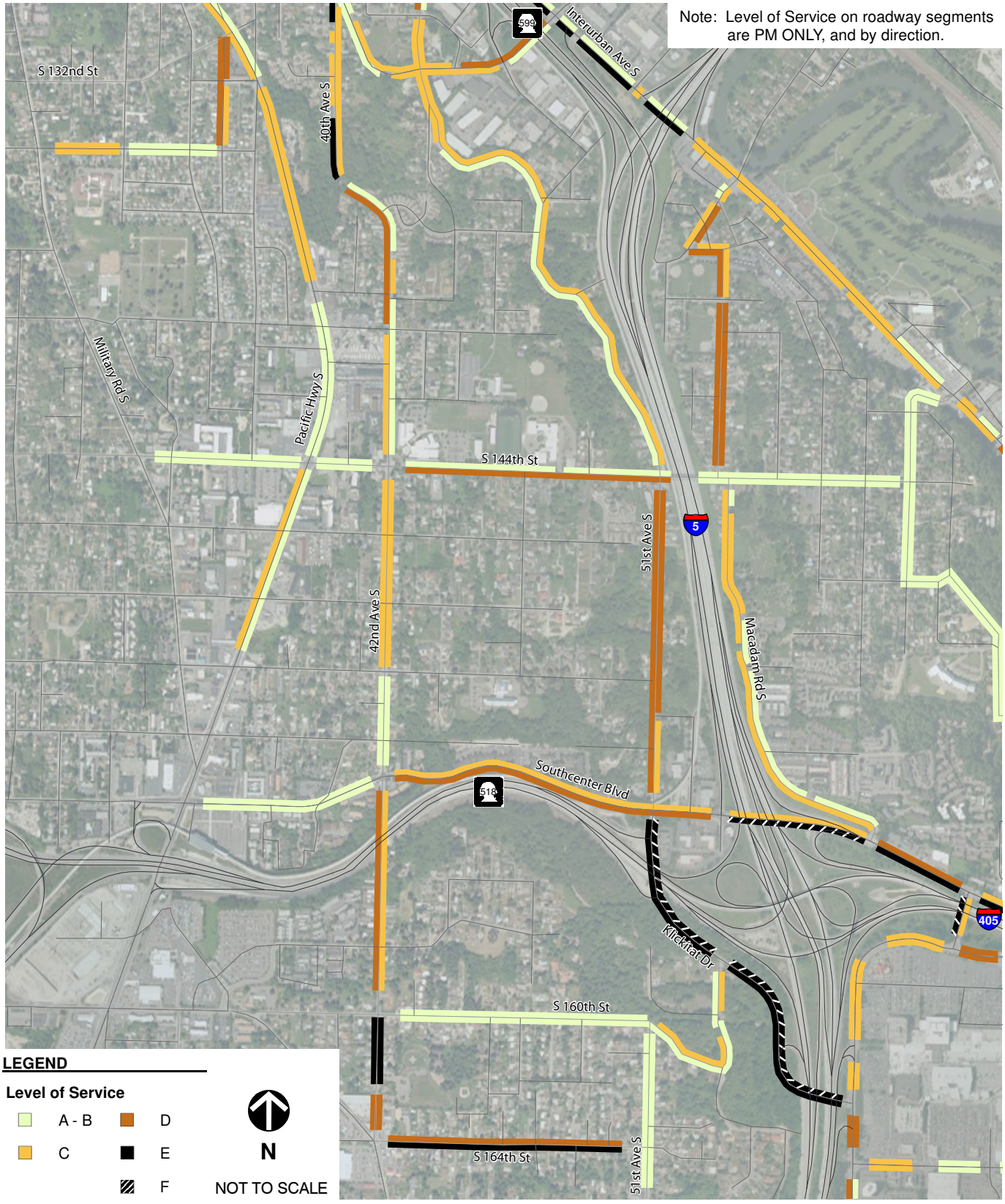


CITY OF TUKWILA - 2010 PEDESTRIAN SEGMENT-ONLY LEVEL OF SERVICE (SECTION 4)

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig18C_los_zone4_PED_hash.mxd

FIGURE B-4

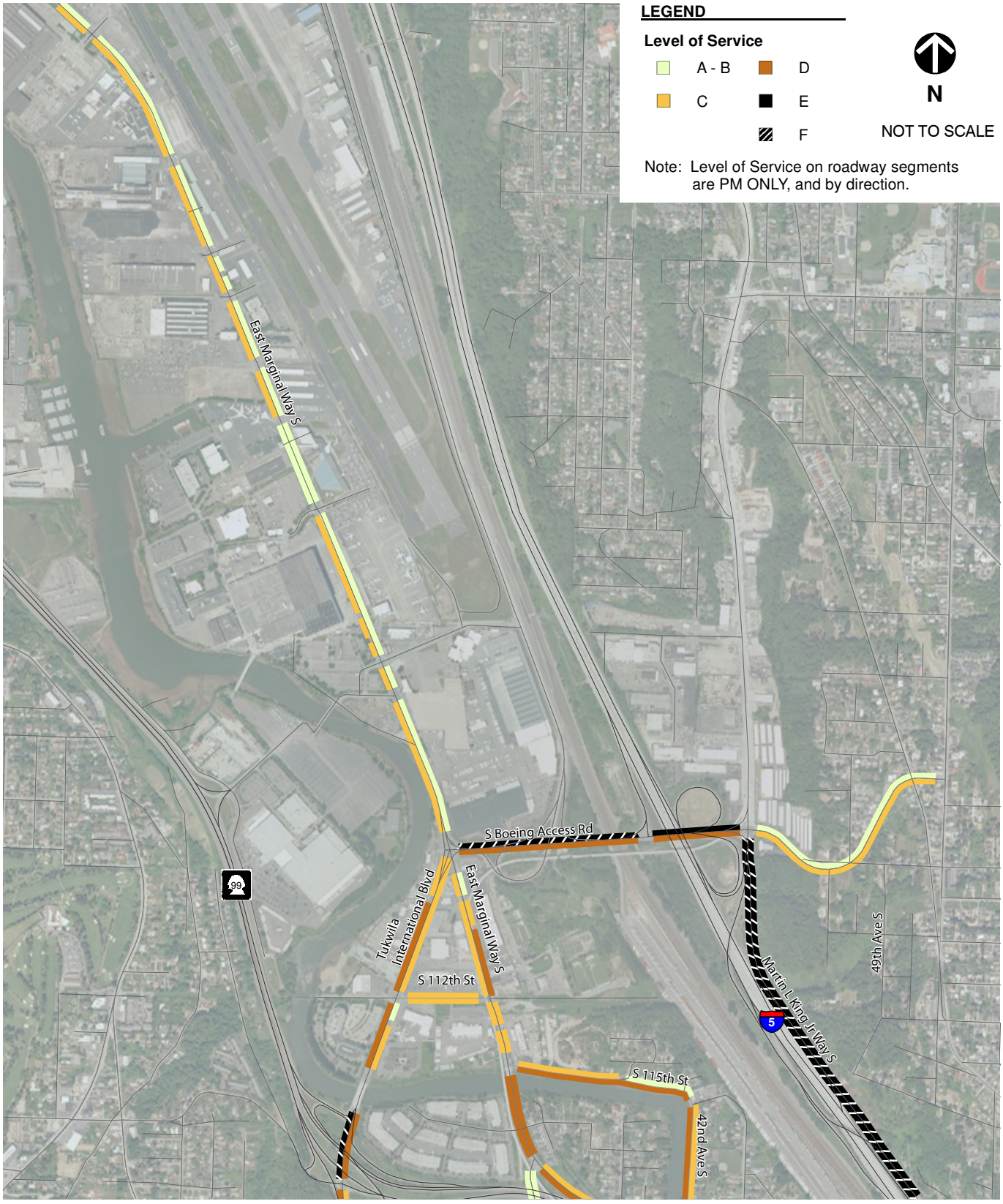


CITY OF TUKWILA - 2010 PEDESTRIAN SEGMENT-ONLY LEVEL OF SERVICE (SECTION 5)

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\figB-5_los_sec5_PED_hash.mxd

FIGURE B-5



CITY OF TUKWILA -
2010 PEDESTRIAN SEGMENT-ONLY LEVEL OF SERVICE (SECTION 6)

FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\April_2012\fig20C_los_zone6_PED_hash.mxd

FIGURE B-6

APPENDIX C:

CITY OF TUKWILA LAND USE FORECASTS

TABLE C-1 – LAND USE DATA FOR THE CITY OF TUKWILA (2010-2030)

TAZ	2010		2030		Growth 2010-2030	
	Households	Employment	Households	Employment	Households	Employment
1	0	6166	223	7754	223	1588
2	0	734	141	866	141	132
3	0	294	141	426	141	132
4	0	943	304	984	304	41
5	0	518	161	800	161	282
6	0	378	146	528	146	150
7	0	749	311	1219	311	470
8	0	551	236	592	236	41
9	0	931	147	1607	147	676
10	0	1004	147	1276	147	272
11	0	550	0	618	0	68
12	0	1063	0	1131	0	68
13	2	702	0	1106	-2	404
14	0	1172	0	1645	0	473
15	0	559	0	627	0	68
16	0	271	0	339	0	68
17	0	604	0	672	0	68
18	0	1139	0	1207	0	68
19	1	316	21	551	20	235
20	2	181	341	270	339	89
21	0	248	300	278	300	30
22	0	255	199	358	199	103
23	3	928	3	1153	0	225
24	0	713	0	781	0	68
25	0	1100	0	1325	0	225
26	1	1115	111	3551	110	2436
27	4	86	111	3551	107	3465
28	113	525	155	597	42	72
29	1080	111	1102	271	22	160
30	563	281	596	281	33	0
31	0	781	12	941	12	160
32	8	950	8	1335	0	385
33	88	128	100	353	12	225
34	558	370	588	530	30	160
35	132	5	199	5	67	0
36	224	56	224	56	0	0
37	5	0	67	0	62	0
38	127	6	189	6	62	0

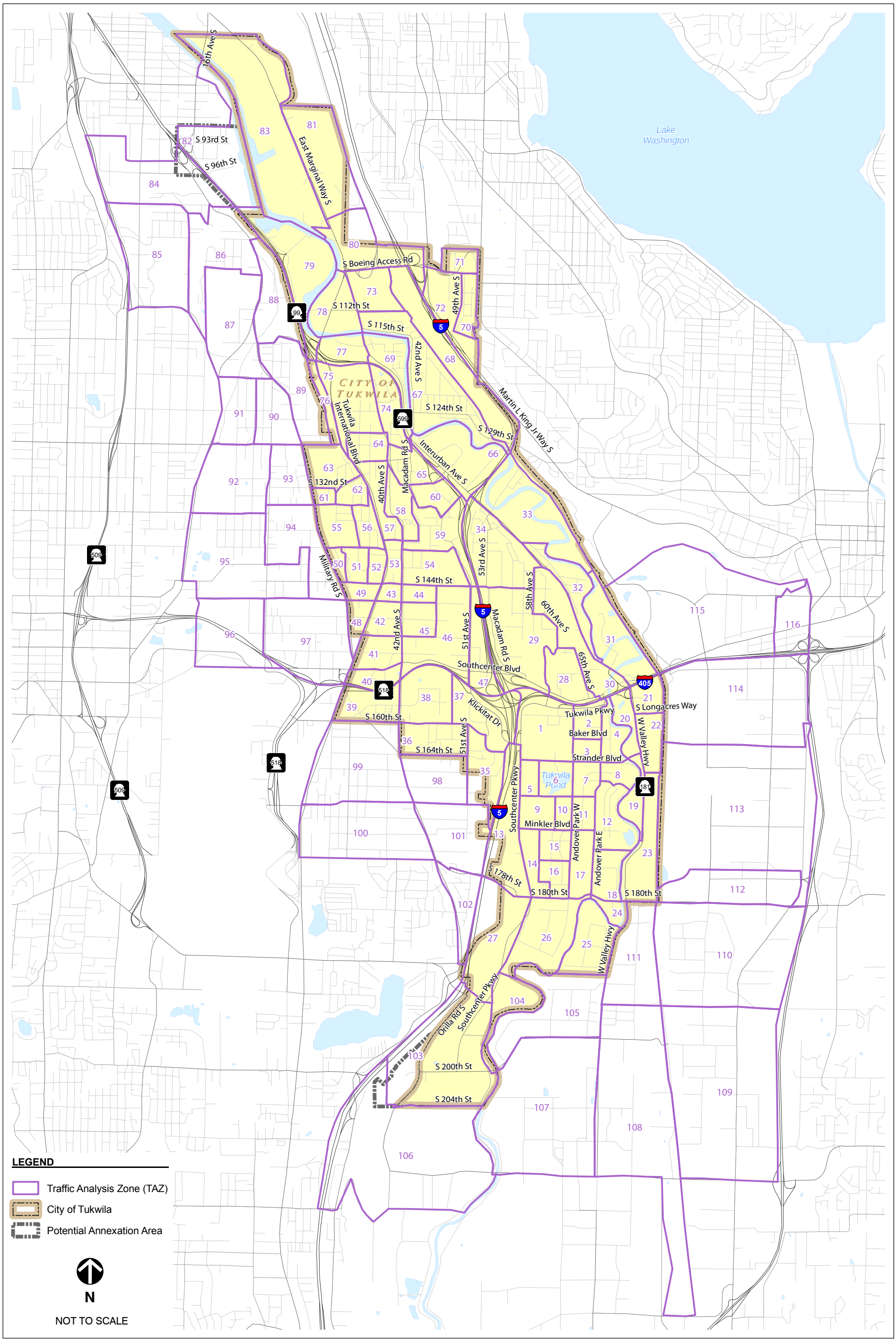
TABLE C-1 – LAND USE DATA FOR THE CITY OF TUKWILA (2010-2030)

TAZ	2010		2030		Growth 2010-2030	
	Households	Employment	Households	Employment	Households	Employment
39	214	252	251	472	37	220
40	353	13	383	93	30	80
41	271	188	304	268	33	80
42	162	75	211	184	49	109
43	95	49	122	78	27	29
44	35	7	97	7	62	0
45	66	6	128	6	62	0
46	475	36	507	36	32	0
47	18	239	30	311	12	72
48	123	267	168	517	45	250
49	279	141	306	170	27	29
50	85	8	147	8	62	0
51	158	18	191	18	33	0
52	149	150	176	179	27	29
53	114	42	162	151	48	109
54	89	40	151	40	62	0
55	98	18	160	18	62	0
56	158	17	201	247	43	230
57	188	58	215	221	27	163
58	64	2	126	2	62	0
59	158	22	220	22	62	0
60	20	721	20	946	0	225
61	34	12	96	12	62	0
62	112	4	182	4	70	0
63	77	234	100	306	23	72
64	104	52	116	92	12	40
65	71	135	100	389	29	254
66	0	3125	0	3351	0	226
67	392	274	404	278	12	4
68	0	0	0	0	0	0
69	109	1	171	1	62	0
70	128	4	150	4	22	0
71	41	5	103	5	62	0
72	13	35	75	35	62	0
73	0	250	0	1200	0	950
74	15	2341	15	2381	0	40
75	10	1582	10	2532	0	950
76	13	101	13	326	0	225

TABLE C-1 – LAND USE DATA FOR THE CITY OF TUKWILA (2010-2030)

TAZ	2010		2030		Growth 2010-2030	
	Households	Employment	Households	Employment	Households	Employment
77	0	807	0	847	0	40
78	0	2540	0	3490	0	950
79	0	213	0	393	0	180
80	0	500	0	500	0	0
81	0	361	0	1311	0	950
83	17	6110	17	7061	0	951
103	16	2	111	3551	95	3550
104	0	0	78	3551	78	3551

Source: City of Tukwila, 2011.



FEHR PEERS

\\fpse2\data2\2010Projects\SE10-0181.00_Tukwila_TransElement\Graphics\GIS\MXD\figB1_TAZ_appendix.mxd

CITY OF TUKWILA -
TRANSPORTATION AREA ZONE (TAZ) MAP
FIGURE C-1

APPENDIX D:

2030 REVENUE FORECASTS FOR TRANSPORTATION CAPITAL PROJECTS

Henderson,
Young &
Company

MEMORANDUM

TO: Tom Noguchi – Fehr & Peers

FROM: Randy Young

DATE: September 19, 2011

RE: Initial Research for Tukwila Transportation Funding

In preparation for our meeting with City staff on September 26th I have reviewed the City's funding of transportation capital improvements during the past 5 years (2006-2010), and their planned funding in the City's CIP for 2011-2016.

Attached to this memo is a compilation of my initial research. It contains the following information that may be useful for our discussions with City staff:

Please keep in mind that THIS INITIAL RESEARCH IS NOT OUR ESTIMATE OF LIKELY REVENUE FOR TRANSPORTATION CAPITAL IMPROVEMENTS. We will prepare our estimates after meeting with City staff during which we will discuss assumptions I should use. Two important questions for discussion are:

1. Which sources of revenue should be included in the initial estimates?
2. What basis and/or assumptions should be used for each estimate?

Feel free to share this memo and initial research compilation with City staff prior to the September 26th meeting, or we can distribute it at the meeting.

Tukwila Transportation Project Expenditure "Capacity"

Tukwila's transportation project expenditure "capacity" is not a forecast of future expenditures, nor is it a forecast of future revenues. The "capacity" indicates how much Tukwila's 20-year Transportation Plan could cost if it continued to incur expenditures in the future that are similar to the level of expenditures in the recent past and/or the planned level of expenditures in the most recently adopted CIP.

The "capacity" calculation begins by determining the annual average expenditures for transportation projects. Three averages are calculated.

The first annual average is based on the actual expenditures during 2006 - 2010.

The second annual average is based on the adopted CIP for 2011 - 2106.

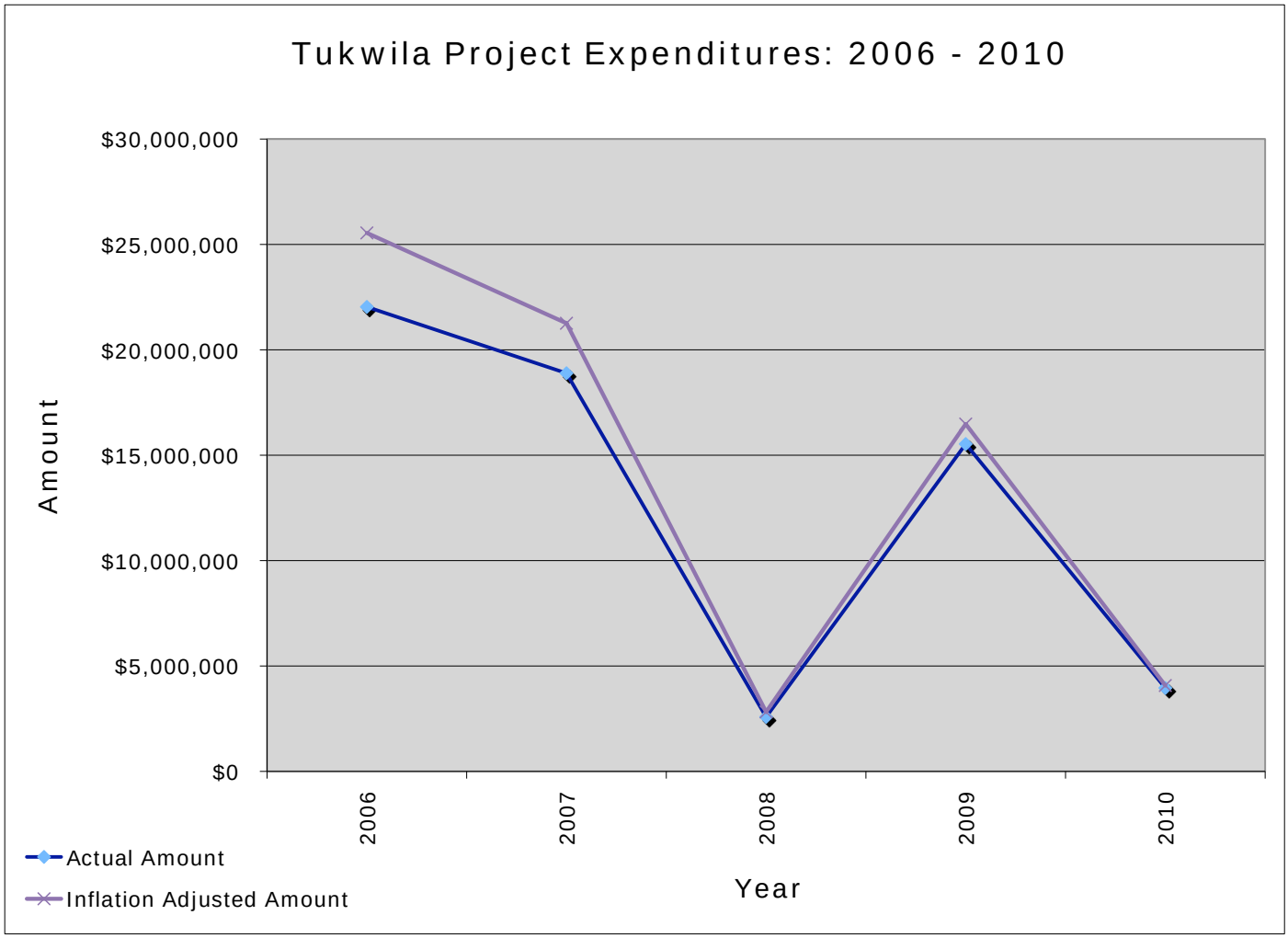
The third annual average is based on the combined data for 2006 - 2106.

Each annual average is multiplied times the 20-year period covered by the Transportation Plan. The result is the amount that Tukwila would spend in the next 20 years if it continued spending at the same annual rate as the recent past and/or near future.

Conclusion: Tukwila has the "capacity" to manage and construct transportation projects during the next 20 years in the range of $280 - $306 million.

Year	2006-2010 Actual Amount	Multiplier for 3% Inflation	Inflation Adjusted Amount	2011-2016 CIP	2006-2016 Combined
2006	22,036,352	1.16	25,546,172		25,546,172
2007	18,889,825	1.13	21,260,664		21,260,664
2008	2,580,491	1.09	2,819,772		2,819,772
2009	15,532,035	1.06	16,477,936		16,477,936
2010	3,954,925	1.03	4,073,573		4,073,573
2011				37,623,000	37,623,000
2012				5,869,000	5,869,000
2013				5,147,000	5,147,000
2014				16,072,000	16,072,000
2015				22,272,000	22,272,000
2016				4,830,000	4,830,000
Total	62,993,628		70,178,117	91,813,000	161,991,117
Annual Average	12,598,726		14,035,623	15,302,167	14,726,465
"Capacity" = 20 years @ Annual Average			280,712,468	306,043,333	294,529,303

Tukwila Transportation Project Expenditures: 2006-2010



Year	Actual Amount	Multiplier for 3% Inflation	Inflation Adjusted Amount
2006	22,036,352	1.16	25,546,172
2007	18,889,825	1.13	21,260,664
2008	2,580,491	1.09	2,819,772
2009	15,532,035	1.06	16,477,936
2010	3,954,925	1.03	4,073,573
Total	62,993,628		70,178,117
Annual Average	12,598,726		14,035,623
Average Annual % Increase	-29.07%		-30.73%
Estimate = 20 years @ Annual Average			280,712,468

Tukwila CIP Project Funding During 2011-2016
(excludes prior to 2011 and after 2016)
All amounts are $ x 1,000

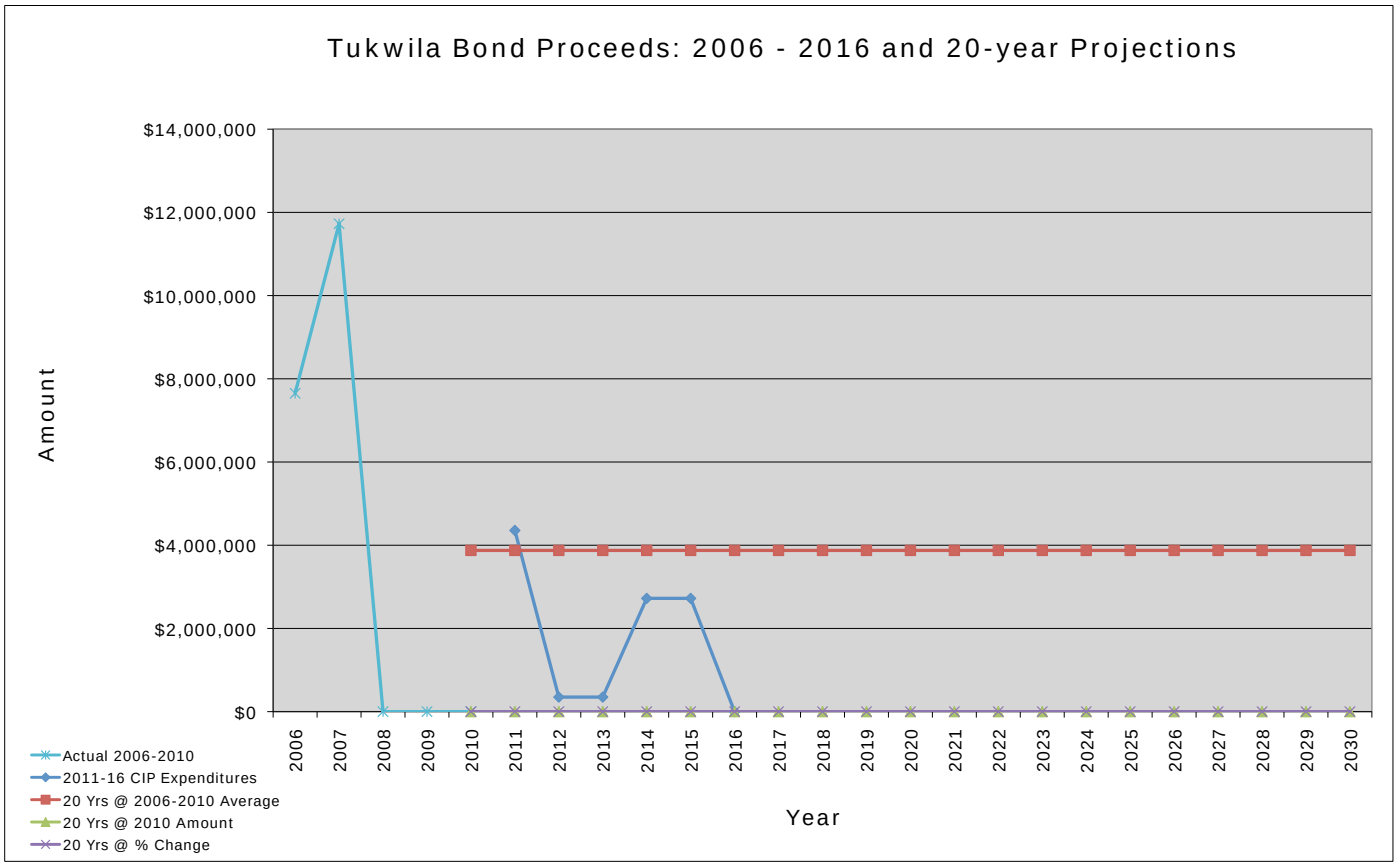
Project	Total	2011	2012	2013	2014	2015	2016
Awarded Grant							
Southcenter Pkwy	6,442	6,442					
Tukwila Urban Center Access	8,250	8,250					
Tukwila Urban Center Ped/Bike	517	517					
Tukwila Urban Center - Transit	468		468				
Total: Awarded Grant	15,677	15,209	468	0	0	0	0
Proposed Grant							
Tukwila Urban Center Ped/Bike	5,200					5,200	
Tukwila Urban Center - Transit	1,035			1,035			
Boeing Access Rd	24,588		1,400	1,400	10,894	10,894	
Total: Proposed Grant	30,823	0	1,400	2,435	10,894	16,094	0
Awarded + Proposed Grant	46,500	15,209	1,868	2,435	10,894	16,094	0
LID							
Tukwila Urban Center Access	11,545	11,545					
Bond							
Southcenter Pkwy	4,356	4,356					
Boeing Access Rd	6,146		350	350	2,723	2,723	
Total: Bond	10,502	4,356	350	350	2,723	2,723	0
Impact Fees							
S 144 St Phase II	68	68					
Andover Park West	981		981				
Macadam Rd & S 144th St	1	1					
Andover Park E/Minkler Blvd	55	55					
West Valley Hwy/S 156 St	75	75					
Andover Park E/Industry Dr	75	75					
S 133 St/SR 599	20	20					
E Marginal Way	50		50				
Total: City Oper Revenue	1,325	294	1,031	0	0	0	0
Park Impact Fees							
Tukwila Urban Center Ped/Bike	1,600				80	1,520	
Mitigation Expected							
Southcenter Pkwy	3,458	3,458					
Impact Fees + Mitigation	6,383	3,752	1,031	0	80	1,520	0

Project	Total	2011	2012	2013	2014	2015	2016
City Oper. Revenue							
Tukwila Urban Center Ped/Bike	820				20	800	
Tukwila Int'l Blvd Phase III	0						
Interurban Ave S	0						
Tukwila Urban Center - Transit	797	682	115				
Tukwila Int'l Blvd Phase II	25	25					
Strander Blvd Extension to SW	0						
Andover Park West	603	123	480				
Macadam Rd & S 144th St	16	16					
Andover Park E/Minkler Blvd	667	20	45	602			
Andover Park East/Industry Dr	525		25		500		
Annual Overlay & Repair	8,660	1,250	1,350	1,450	1,500	1,550	1,560
Annual Traffic Signal Program	525	100	100	105	105	115	
Walk & Roll Program	0						
Transp Element of Comp Plan	250	250					
40-42 Ave South	3,450	150	300				3,000
Annual Bridge Insp & Rep	1,365	145	205	205	270	270	270
Total: City Oper Revenue	16,883	2,761	2,620	2,362	2,375	1,935	4,830
Grand Total	91,813	37,623	5,869	5,147	16,072	22,272	4,830

Tukwila Transportation Revenues 2010 - 2030

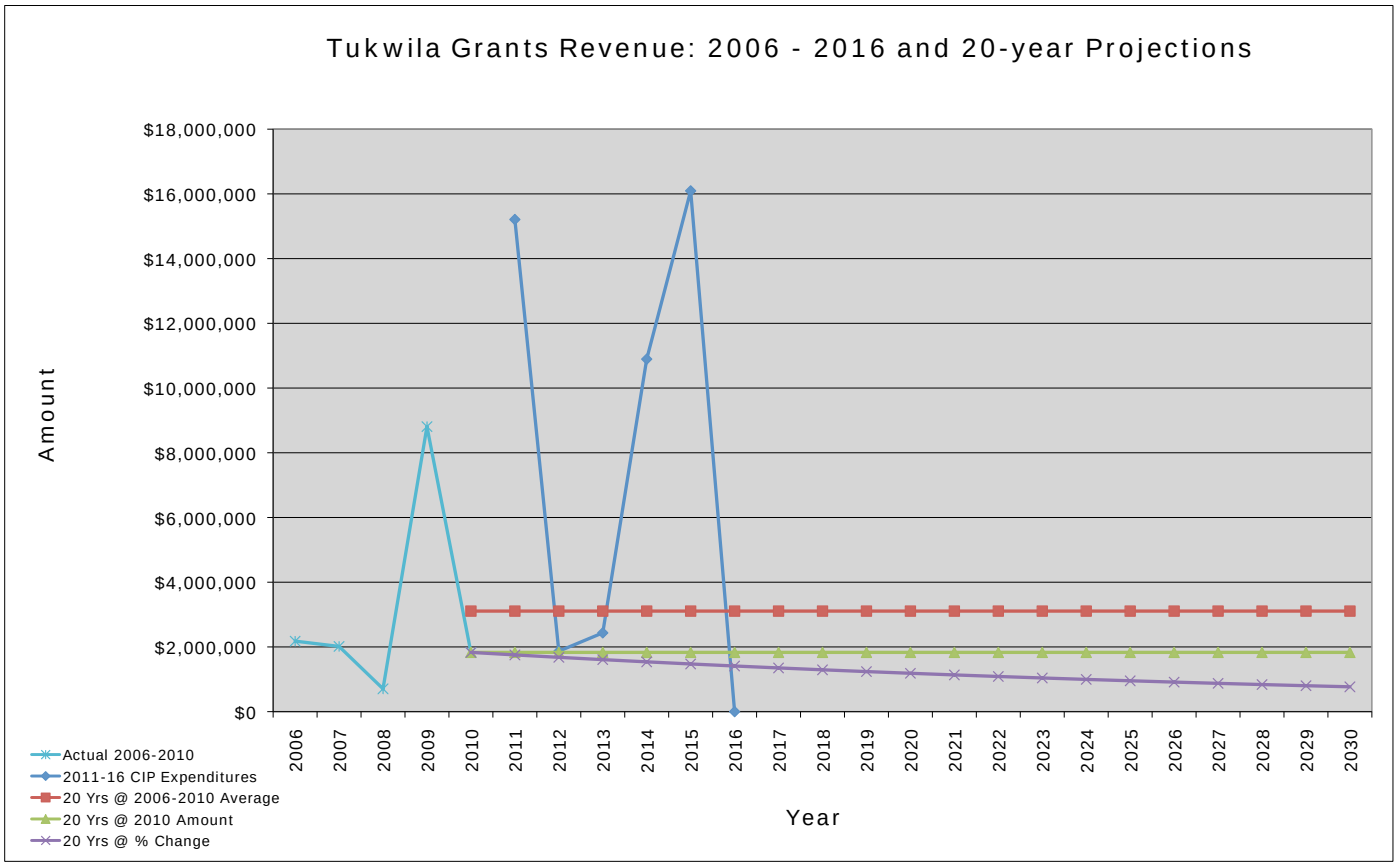
Page	Source of Revenue	Average	Low Estimate	High Estimate
	Existing Revenue Sources for Capital			
6	Bond Proceeds for Transportation	81,384,269		
7	Grants for Transportation	65,269,743		
8	Sales Tax for Transportation	41,466,466		
9	Real Estate Excise Tax for Transportation	13,164,774		
10	Development Payments for Transportation	10,490,189		
11	Interest & Other Earnings for Transportation	4,146,421		
12	Parking Tax	2,740,042		
13	Motor Vehicle Tax	2,410,582		
14	City Operating Revenue			
?	Head Tax			
?				
	Total: Existing Revenue for Capital	221,072,485	0	0
	Potential Additional Revenue Sources for Capital			
A.	Impact Fees - Reciprocal from King County			
B.	Business License Fee for Transportation			
C.	Voted General Obligation Bonds			
D.	Business and Occupations Tax			
E.	Transportation Benefit District			
F.				
G.				
	Total: Potential Additional Revenue for Capital	0	0	0
	Combined Total for Capital: Existing + Potential	221,072,485	0	0

Tukwila Bond Proceeds



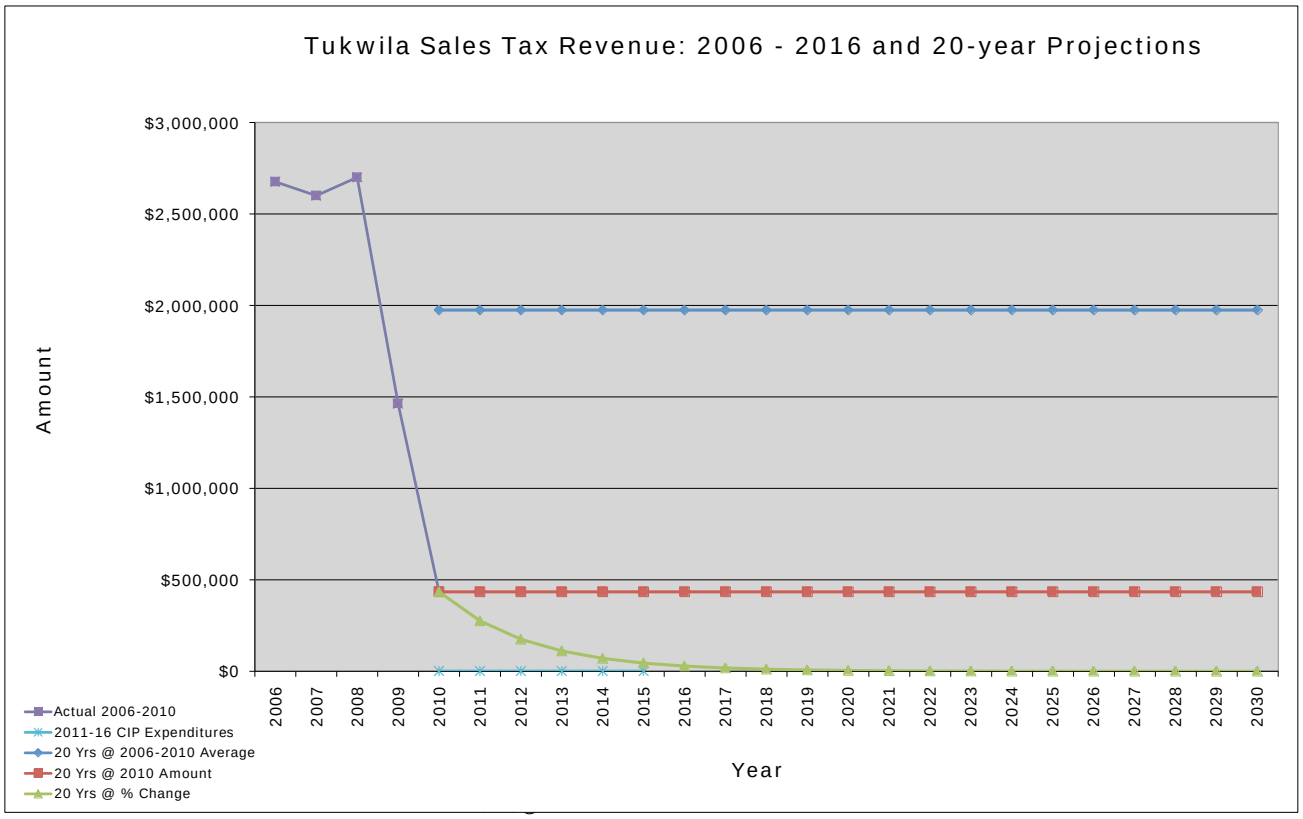
Year	Actual 2006-2010	2011-16 CIP Expenditures	20 Yrs @ 2006-2010 Average	20 Yrs @ 2010 Amount	20 Yrs @ % Change
2006	7,651,932				
2007	11,725,275				
2008	0				
2009	0				
2010	0		3,875,441	0	0
2011		4,356,000	3,875,441	0	0
2012		350,000	3,875,441	0	0
2013		350,000	3,875,441	0	0
2014		2,723,000	3,875,441	0	0
2015		2,723,000	3,875,441	0	0
2016		0	3,875,441	0	0
2017			3,875,441	0	0
2018			3,875,441	0	0
2019			3,875,441	0	0
2020			3,875,441	0	0
2021			3,875,441	0	0
2022			3,875,441	0	0
2023			3,875,441	0	0
2024			3,875,441	0	0
2025			3,875,441	0	0
2026			3,875,441	0	0
2027			3,875,441	0	0
2028			3,875,441	0	0
2029			3,875,441	0	0
2030			3,875,441	0	0
			81,384,269	0	0
2006-2010 Annual Average	3,875,441				
2006-2010 Average Annual % Increase	-100.00%				

Tukwila Grants Revenue



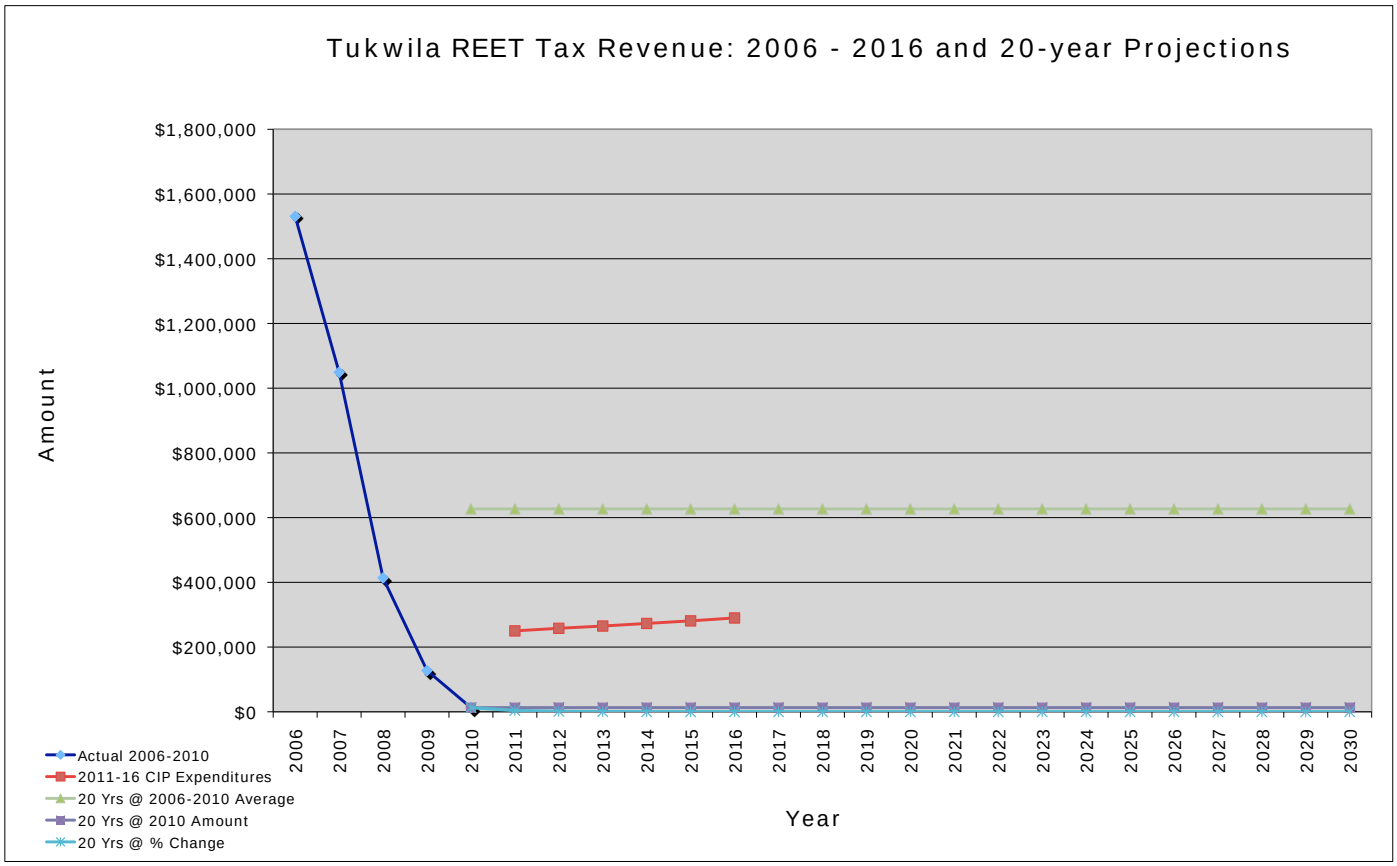
Year	Actual 2006-2010	2011-16 CIP Expenditures	20 Yrs @ 2006-2010 Average	20 Yrs @ 2010 Amount	20 Yrs @ % Change
2006	2,179,145				
2007	2,015,737				
2008	706,390				
2009	8,807,788				
2010	1,831,355		3,108,083	1,831,355	1,831,355
2011		15,209,000	3,108,083	1,831,355	1,753,453
2012		1,868,000	3,108,083	1,831,355	1,678,865
2013		2,435,000	3,108,083	1,831,355	1,607,450
2014		10,894,000	3,108,083	1,831,355	1,539,072
2015		16,094,000	3,108,083	1,831,355	1,473,603
2016		0	3,108,083	1,831,355	1,410,919
2017			3,108,083	1,831,355	1,350,902
2018			3,108,083	1,831,355	1,293,437
2019			3,108,083	1,831,355	1,238,417
2020			3,108,083	1,831,355	1,185,738
2021			3,108,083	1,831,355	1,135,299
2022			3,108,083	1,831,355	1,087,006
2023			3,108,083	1,831,355	1,040,767
2024			3,108,083	1,831,355	996,495
2025			3,108,083	1,831,355	954,106
2026			3,108,083	1,831,355	913,520
2027			3,108,083	1,831,355	874,661
2028			3,108,083	1,831,355	837,455
2029			3,108,083	1,831,355	801,831
2030			3,108,083	1,831,355	767,723
			65,269,743	38,458,455	25,772,072
2006-2010 Annual Average	3,108,083				
2006-2010 Average Annual % Increase	-4.25%				

Tukwila Sales Tax Revenue



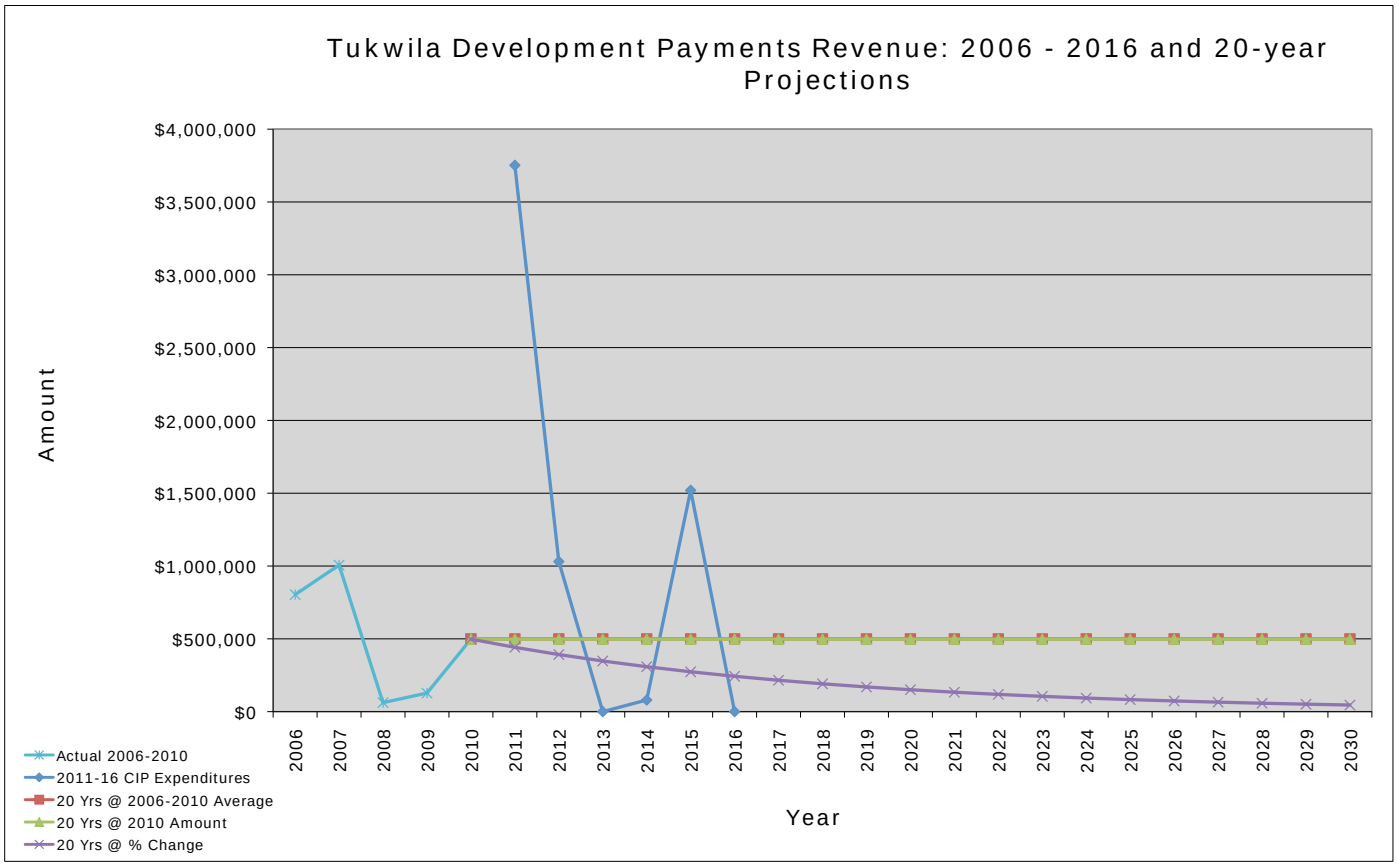
Year	Actual 2006-2010	2011-16 CIP Expenditures	2006-2010 Average	20 Yrs @ 2010 Amount	20 Yrs @ % Change
2006	2,675,938				
2007	2,600,000				
2008	2,700,000				
2009	1,462,616				
2010	434,414	1,000	1,974,594	434,414	434,414
2011		1,000	1,974,594	434,414	275,747
2012		1,000	1,974,594	434,414	175,032
2013		1,000	1,974,594	434,414	111,103
2014		1,000	1,974,594	434,414	70,523
2015		1,000	1,974,594	434,414	44,765
2016			1,974,594	434,414	28,415
2017			1,974,594	434,414	18,037
2018			1,974,594	434,414	11,449
2019			1,974,594	434,414	7,267
2020			1,974,594	434,414	4,613
2021			1,974,594	434,414	2,928
2022			1,974,594	434,414	1,859
2023			1,974,594	434,414	1,180
2024			1,974,594	434,414	749
2025			1,974,594	434,414	475
2026			1,974,594	434,414	302
2027			1,974,594	434,414	192
2028			1,974,594	434,414	122
2029			1,974,594	434,414	77
2030			1,974,594	434,414	49
			41,466,466	9,122,694	1,189,296
2006-2010 Annual Average	1,974,594				
2006-2010 Average Annual % Increase	-36.52%				

Tukwila Real Estate Excise Tax Revenue



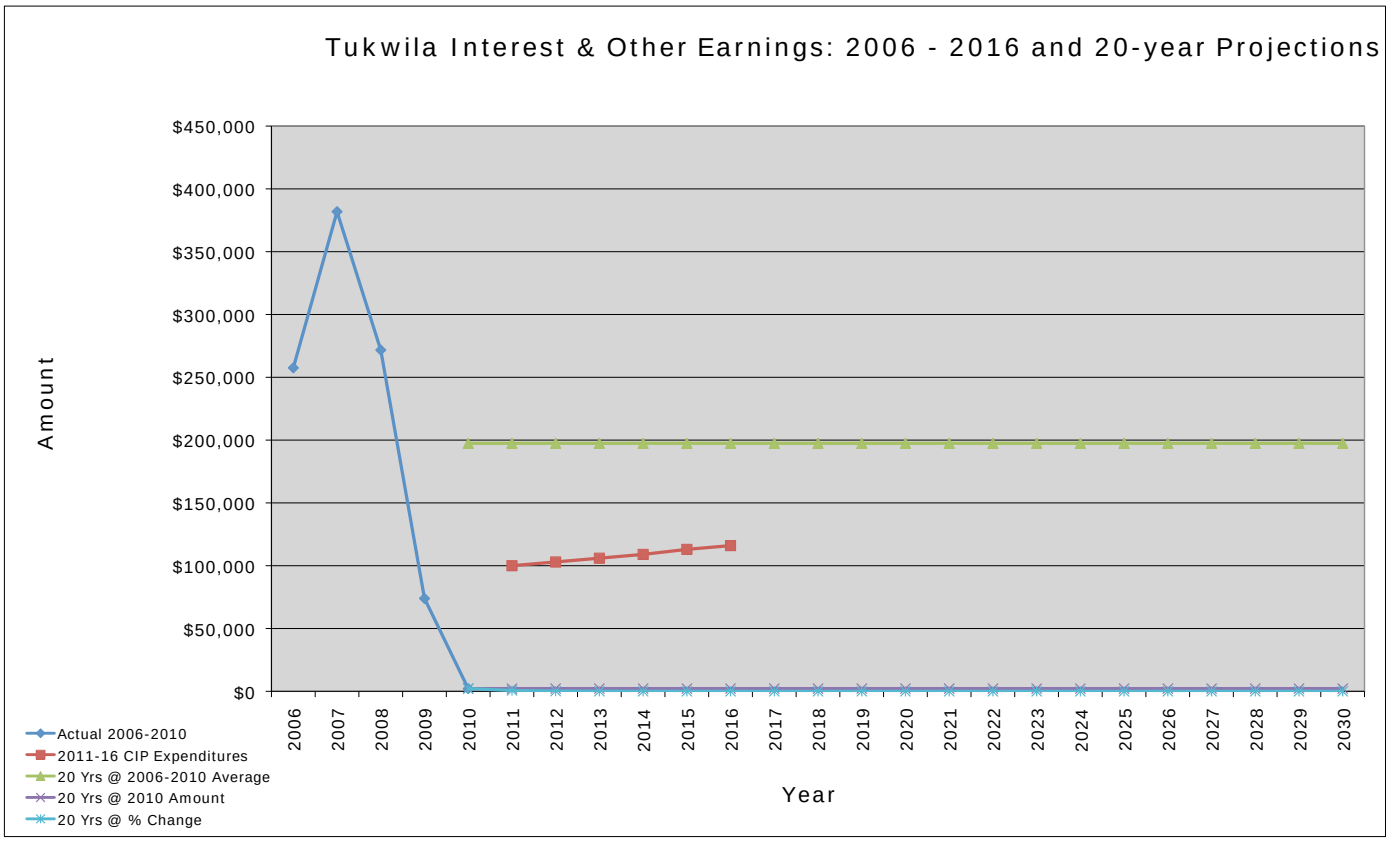
Year	Actual 2006-2010	2011-16 CIP Expenditures	20 Yrs @ 2006-2010 Average	20 Yrs @ 2010 Amount	20 Yrs @ % Change
2006	1,530,994				
2007	1,049,090				
2008	413,928				
2009	127,493				
2010	12,965		626,894	12,965	12,965
2011		250,000	626,894	12,965	3,933
2012		258,000	626,894	12,965	1,193
2013		265,000	626,894	12,965	362
2014		273,000	626,894	12,965	110
2015		281,000	626,894	12,965	33
2016		290,000	626,894	12,965	10
2017			626,894	12,965	3
2018			626,894	12,965	1
2019			626,894	12,965	0
2020			626,894	12,965	0
2021			626,894	12,965	0
2022			626,894	12,965	0
2023			626,894	12,965	0
2024			626,894	12,965	0
2025			626,894	12,965	0
2026			626,894	12,965	0
2027			626,894	12,965	0
2028			626,894	12,965	0
2029			626,894	12,965	0
2030			626,894	12,965	0
			13,164,774	272,265	18,611
2006-2010 Annual Average	626,894				
2006-2010 Average Annual % Increase	-69.66%				

Tukwila Development Payments Revenue



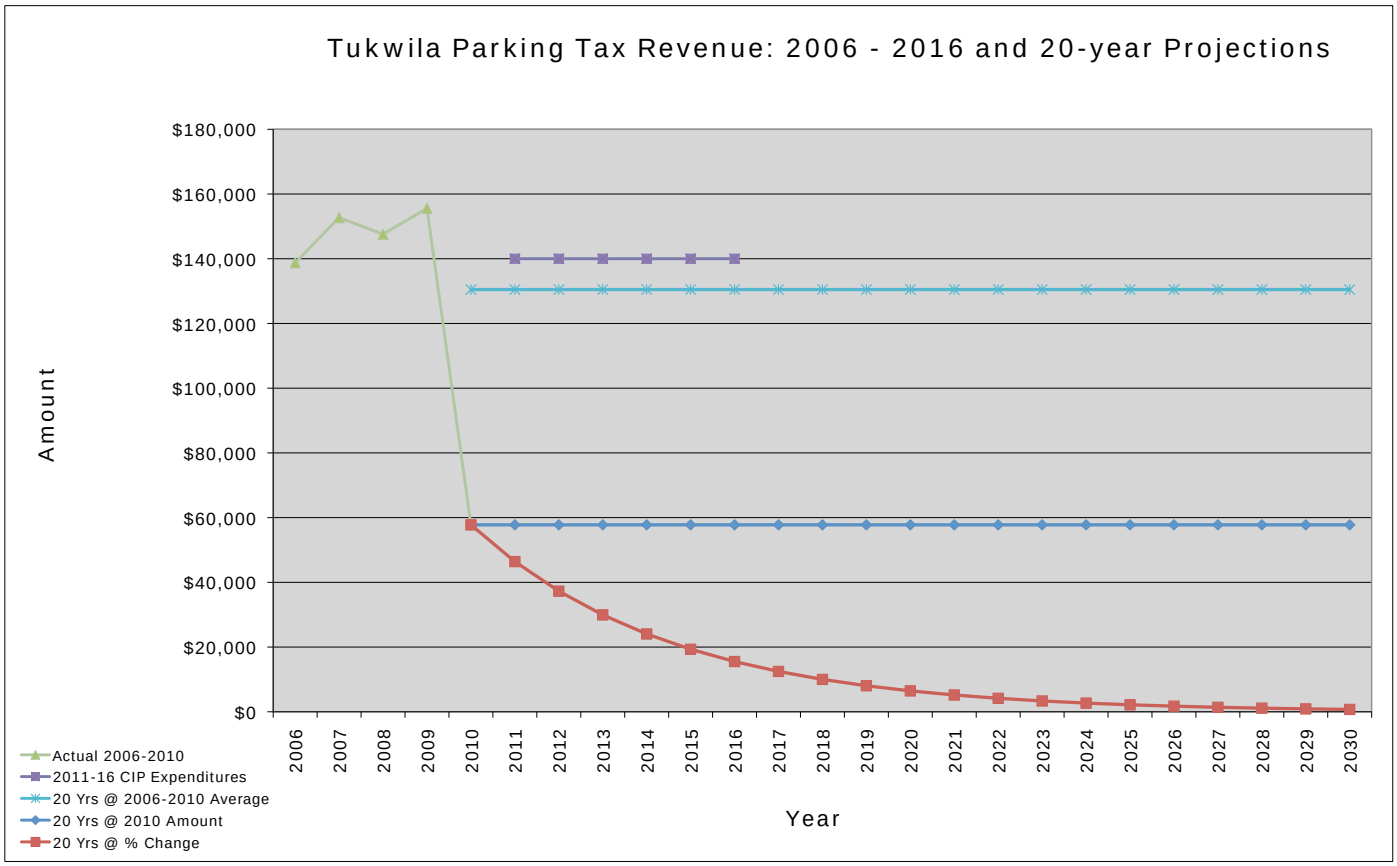
Year	Actual 2006-2010	2011-16 CIP Expenditures	20 Yrs @ 2006-2010 Average	20 Yrs @ 2010 Amount	20 Yrs @ % Change
2006	803,541				
2007	1,006,649				
2008	61,844				
2009	127,622				
2010	498,008		499,533	498,008	498,008
2011		3,752,000	499,533	498,008	441,869
2012		1,031,000	499,533	498,008	392,058
2013		0	499,533	498,008	347,862
2014		80,000	499,533	498,008	308,649
2015		1,520,000	499,533	498,008	273,856
2016		0	499,533	498,008	242,985
2017			499,533	498,008	215,594
2018			499,533	498,008	191,290
2019			499,533	498,008	169,727
2020			499,533	498,008	150,594
2021			499,533	498,008	133,618
2022			499,533	498,008	118,555
2023			499,533	498,008	105,191
2024			499,533	498,008	93,333
2025			499,533	498,008	82,812
2026			499,533	498,008	73,477
2027			499,533	498,008	65,194
2028			499,533	498,008	57,845
2029			499,533	498,008	51,324
2030			499,533	498,008	45,538
			10,490,189	10,458,168	4,059,377
2006-2010 Annual Average	499,533				
2006-2010 Average Annual % Increase	-11.27%				

Tukwila Interest & Other Earnings



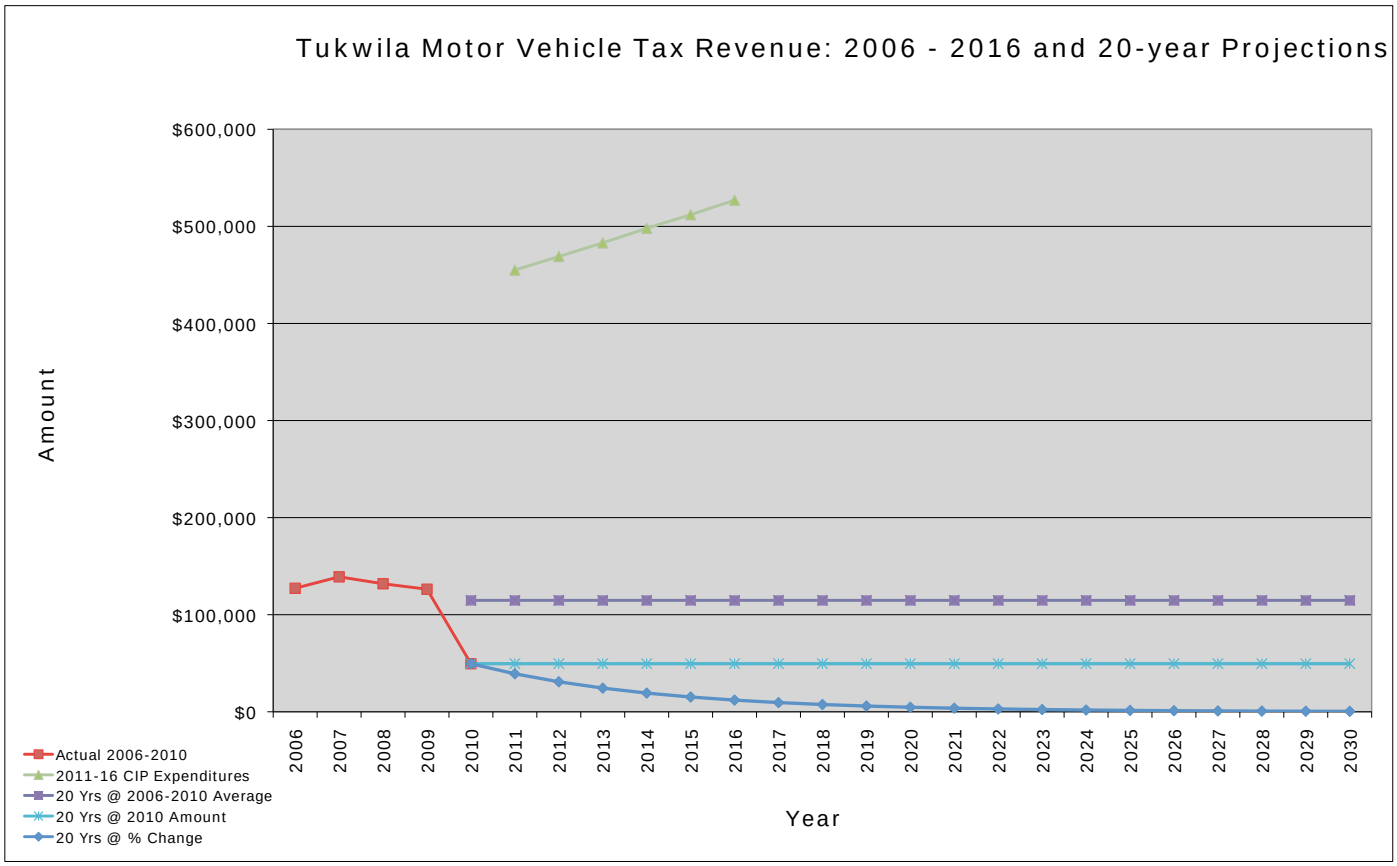
Year	Actual 2006-2010	2011-16 CIP Expenditures	20 Yrs @ 2006-2010 Average	20 Yrs @ 2010 Amount	20 Yrs @ % Change
2006	257,527				
2007	381,874				
2008	271,729				
2009	73,958				
2010	2,155		197,449	2,155	2,155
2011		100,000	197,449	2,155	652
2012		103,000	197,449	2,155	197
2013		106,000	197,449	2,155	60
2014		109,000	197,449	2,155	18
2015		113,000	197,449	2,155	5
2016		116,000	197,449	2,155	2
2017			197,449	2,155	0
2018			197,449	2,155	0
2019			197,449	2,155	0
2020			197,449	2,155	0
2021			197,449	2,155	0
2022			197,449	2,155	0
2023			197,449	2,155	0
2024			197,449	2,155	0
2025			197,449	2,155	0
2026			197,449	2,155	0
2027			197,449	2,155	0
2028			197,449	2,155	0
2029			197,449	2,155	0
2030			197,449	2,155	0
			4,146,421	45,255	3,089
2006-2010 Annual Average	197,449				
2006-2010 Average Annual % Increase	-69.75%				

Tukwila Parking Tax Revenue



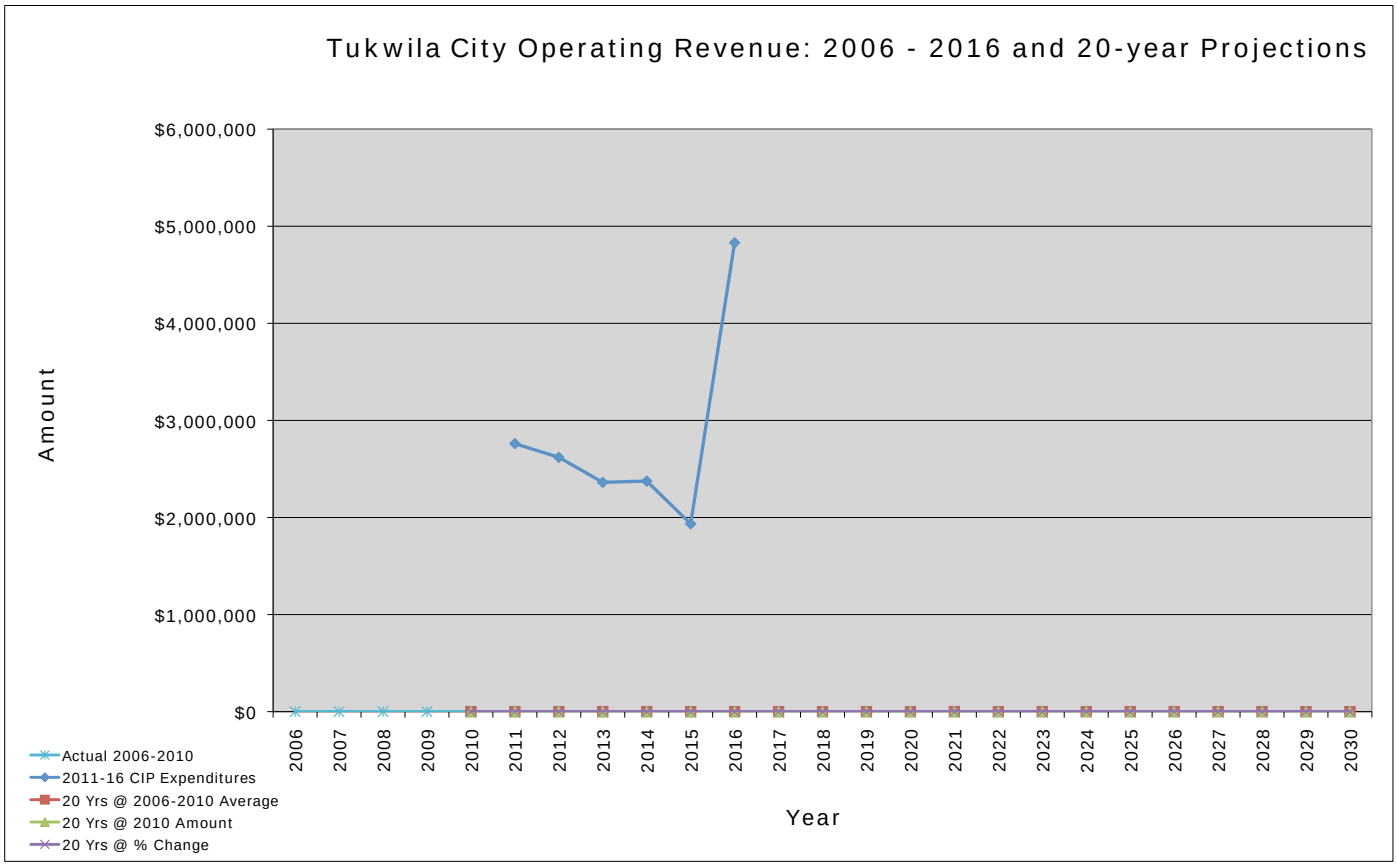
Year	Actual 2006-2010	2011-16 CIP Expenditures	20 Yrs @ 2006-2010 Average	20 Yrs @ 2010 Amount	20 Yrs @ % Change
2006	138,744				
2007	152,701				
2008	147,588				
2009	155,585				
2010	57,773		130,478	57,773	57,773
2011		140,000	130,478	57,773	46,409
2012		140,000	130,478	57,773	37,280
2013		140,000	130,478	57,773	29,947
2014		140,000	130,478	57,773	24,057
2015		140,000	130,478	57,773	19,325
2016		140,000	130,478	57,773	15,524
2017			130,478	57,773	12,470
2018			130,478	57,773	10,017
2019			130,478	57,773	8,047
2020			130,478	57,773	6,464
2021			130,478	57,773	5,193
2022			130,478	57,773	4,171
2023			130,478	57,773	3,351
2024			130,478	57,773	2,692
2025			130,478	57,773	2,162
2026			130,478	57,773	1,737
2027			130,478	57,773	1,395
2028			130,478	57,773	1,121
2029			130,478	57,773	900
2030			130,478	57,773	723
			2,740,042	1,213,233	290,757
2006-2010 Annual Average	130,478				
2006-2010 Average Annual % Increase	-19.67%				

Tukwila Motor Vehicle Tax Revenue



Year	Actual 2006-2010	2011-16 CIP Expenditures	20 Yrs @ 2006-2010 Average	20 Yrs @ 2010 Amount	20 Yrs @ % Change
2006	127,255				
2007	139,024				
2008	131,882				
2009	126,259				
2010	49,528		114,790	49,528	49,528
2011		455,000	114,790	49,528	39,120
2012		469,000	114,790	49,528	30,899
2013		483,000	114,790	49,528	24,405
2014		498,000	114,790	49,528	19,276
2015		512,000	114,790	49,528	15,225
2016		527,000	114,790	49,528	12,026
2017			114,790	49,528	9,499
2018			114,790	49,528	7,502
2019			114,790	49,528	5,926
2020			114,790	49,528	4,680
2021			114,790	49,528	3,697
2022			114,790	49,528	2,920
2023			114,790	49,528	2,306
2024			114,790	49,528	1,822
2025			114,790	49,528	1,439
2026			114,790	49,528	1,136
2027			114,790	49,528	898
2028			114,790	49,528	709
2029			114,790	49,528	560
2030			114,790	49,528	442
			2,410,582	1,040,088	234,016
2006-2010 Annual Average	114,790				
2006-2010 Average Annual % Increase	-21.02%				

Tukwila City Operating Revenue



Year	Actual 2006-2010	2011-16 CIP Expenditures	20 Yrs @ 2006-2010 Average	20 Yrs @ 2010 Amount	20 Yrs @ % Change
2006	0				
2007	0				
2008	0				
2009	0				
2010	0		0	0	0
2011		2,761,000	0	0	#NUM!
2012		2,620,000	0	0	#NUM!
2013		2,362,000	0	0	#NUM!
2014		2,375,000	0	0	#NUM!
2015		1,935,000	0	0	#NUM!
2016		4,830,000	0	0	#NUM!
2017			0	0	#NUM!
2018			0	0	#NUM!
2019			0	0	#NUM!
2020			0	0	#NUM!
2021			0	0	#NUM!
2022			0	0	#NUM!
2023			0	0	#NUM!
2024			0	0	#NUM!
2025			0	0	#NUM!
2026			0	0	#NUM!
2027			0	0	#NUM!
2028			0	0	#NUM!
2029			0	0	#NUM!
2030			0	0	#NUM!
			0	0	#NUM!
2006-2010 Annual Average	0				
2006-2010 Average Annual % Increase	#NUM!				

APPENDIX E:

DETAILED COST ESTIMATE SHEETS

Construction Cost Estimate
Project 1.1.C - South of S 180th Street from Southcenter Parkway to West Valley Highway: New Roadway Construction

Project Description: New roadway with bicycle lanes and sidewalks or multi-use path. Five lanes between Southcenter Parkway and Andover Park W, and three lanes between Andover Park W and West Valley Highway.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	112,550	SF	$ 2.80	$ 315,140
Asphalt Concrete Overlay	76,600	SF	$ 0.18	$ 13,788
Structure	22,500	SF	$ 230.00	$ 5,175,000
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	6,320	LF	$ 12.00	$ 75,840
Sidewalk	37,920	SF	$ 4.40	$ 166,848
Curb Ramps	35	EA	$ 1,500.00	$ 52,500
Lighting	3,610	LF	$ 65.00	$ 234,650
Signing and Striping	3,610	LF	$ 4.00	$ 14,440
Storm Drainage - New	1,250	LF	$ 130.00	$ 162,500
Storm Drainage - Modify	2,360	LF	$ 40.00	$ 94,400
Storm Drainage - Containment	3,610	LF	$ 80.00	$ 288,800
Landscaping / Irrigation - Planters & Restoration	3,160	LF	$ 125.00	$ 395,000
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	3	EA	$ 200,000.00	$ 600,000
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	1	EA	$ 400,000.00	$ 400,000
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	2,750	LF	$ 10.00	$ 27,500
Remove Sidewalk	3,000	SF	$ 1.90	$ 5,700
Mobilization (10% of Const. Subtotal)	1	LS	$ 802,211	$ 802,211
Traffic Control (5% of Const. Subtotal)	1	LS	$ 401,105	$ 401,105
SUBTOTAL (w/o mobilization and traffic control)				$ 8,022,106
SUBTOTAL				$ 9,225,422
CONTINGENCY			30%	$ 2,767,627
TOTAL CONSTRUCTION COST				**$ 11,993,048**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	115,000	SF	$ 65	$ 7,475,000
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	1	EA	$ 9,650,000	$ 9,650,000
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ 17,125,000**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 2,398,610
Construction Management, Inspection			15%	$ 1,798,957
TOTAL ENGINEERING / MANAGEMENT COST				**$ 4,197,567**
TOTAL CONSTRUCTION COST				$ 11,993,048
TOTAL RIGHT OF WAY COST				$ 17,125,000
TOTAL ENGINEERING / MANAGEMENT COST				$ 4,197,567
TOTAL PROJECT COSTS				**$ 33,315,615**

Notes:
Assumes the Segale Park Drive C and S Glacier Street alignment.
Project will require coordination with land owners.

Construction Cost Estimate

Project 1.2.A - S 180th Street and Southcenter Parkway: Intersection Improvement
Project Description: Add new westbound and southbound left turn lanes and eliminate the north-south split phasing by restriping the southbound approach. Add sidewalks or hillclimb up S 178th Street toward SeaTac.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	10,000	SF	$ 2.80	$ 28,000
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	1,800	LF	$ 90.00	$ 162,000
Curb and Gutter	2,000	LF	$ 12.00	$ 24,000
Sidewalk	25,920	SF	$ 4.40	$ 114,048
Curb Ramps	12	EA	$ 1,500.00	$ 18,000
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	1,200	LF	$ 4.00	$ 4,800
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	1,200	LF	$ 40.00	$ 48,000
Storm Drainage - Containment	1,200	LF	$ 80.00	$ 96,000
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	1,000	LF	$ 125.00	$ 125,000
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	1	EA	$ 200,000.00	$ 200,000
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	1,000	LF	$ 10.00	$ 10,000
Remove Sidewalk	6,400	SF	$ 1.90	$ 12,160
Mobilization (10% of Const. Subtotal)	1	LS	$ 84,201	$ 84,201
Traffic Control (5% of Const. Subtotal)	1	LS	$ 42,100	$ 42,100
SUBTOTAL (w/o mobilization and traffic control)				$ 842,008
SUBTOTAL				$ 968,309
CONTINGENCY			30%	$ 290,493
TOTAL CONSTRUCTION COST				**$ 1,258,802**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	5,500	SF	$ 65	$ 357,500
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ 357,500**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 251,760
Construction Management, Inspection			15%	$ 188,820
TOTAL ENGINEERING / MANAGEMENT COST				**$ 440,581**
TOTAL CONSTRUCTION COST				$ 1,258,802
TOTAL RIGHT OF WAY COST				$ 357,500
TOTAL ENGINEERING / MANAGEMENT COST				$ 440,581
TOTAL PROJECT COSTS				**$ 2,056,883**

Notes:
Recommended improvements with no realignment of S 178th Street and no new Green River crossings.

Construction Cost Estimate

Project 1.3.A - S 180th Street and Andover Park W: Intersection Improvement
Project Description: Restripe the northbound approach to include a single left, through, and right turn lane. Restripe the southbound approach to include a single left turn lane and a shared through-right lane. Eliminate the north-south split phasing and add protected-permitted left turn phasing on all approaches. Add bicycle lanes on the north leg.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	22,500	SF	$ 0.18	$ 4,050
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	0	LF	$ 12.00	$ -
Sidewalk	0	SF	$ 4.40	$ -
Curb Ramps	0	EA	$ 1,500.00	$ -
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	600	LF	$ 4.00	$ 2,400
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	1	EA	$ 75,000.00	$ 75,000
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Sidewalk	0	SF	$ 1.90	$ -
Mobilization (20% of Const. Subtotal)	1	LS	$ 16,290	$ 16,290
Traffic Control (5% of Const. Subtotal)	1	LS	$ 4,073	$ 4,073
SUBTOTAL (w/o mobilization and traffic control)				$ 81,450
SUBTOTAL				$ 101,813
CONTINGENCY			30%	$ 30,544
TOTAL CONSTRUCTION COST				**$ 132,356**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 26,471
Construction Management, Inspection			15%	$ 19,853
TOTAL ENGINEERING / MANAGEMENT COST				**$ 46,325**
TOTAL CONSTRUCTION COST				$ 132,356
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 46,325
TOTAL PROJECT COSTS				**$ 178,681**

Notes:

Construction Cost Estimate

Project 1.4.A - S 180th Street from Sperry Drive S to Green River Bridge: Sidewalk Improvement

Project Description: Construct a sidewalk on the south side of S 180th Street between Sperry Drive S and the Green River Bridge.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	270	LF	$ 12.00	$ 3,240
Sidewalk	2,160	SF	$ 4.40	$ 9,504
Curb Ramps	7	EA	$ 1,500.00	$ 10,500
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	0	LF	$ 4.00	$ -
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	270	LF	$ 125.00	$ 33,750
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Sidewalk	0	SF	$ 1.90	$ -
Mobilization (20% of Const. Subtotal)	1	LS	$ 11,399	$ 11,399
Traffic Control (5% of Const. Subtotal)	1	LS	$ 2,850	$ 2,850
SUBTOTAL (w/o mobilization and traffic control)				$ 56,994
SUBTOTAL				$ 71,243
CONTINGENCY			30%	$ 21,373
TOTAL CONSTRUCTION COST				**$ 92,615**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 18,523
Construction Management, Inspection			15%	$ 13,892
TOTAL ENGINEERING / MANAGEMENT COST				**$ 32,415**
TOTAL CONSTRUCTION COST				$ 92,615
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 32,415
TOTAL PROJECT COSTS				**$ 125,031**

Notes:

Construction Cost Estimate
Project 1.5.A - Andover Park E or Andover Park W from Minkler Boulevard to S 180th Street: Bicycle Facility Improvement

Project Description: Restripe the traffic lanes on Andover Parkway W between Minkler Boulevard and S 180th Street from four to three lanes.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	117,000	SF	$ 0.18	$ 21,060
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	0	LF	$ 12.00	$ -
Sidewalk	0	SF	$ 4.40	$ -
Curb Ramps	0	EA	$ 1,500.00	$ -
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	2,600	LF	$ 4.00	$ 10,400
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Sidewalk	0	SF	$ 1.90	$ -
Mobilization (20% of Const. Subtotal)	1	LS	$ 6,292	$ 6,292
Traffic Control (5% of Const. Subtotal)	1	LS	$ 1,573	$ 1,573
SUBTOTAL (w/o mobilization and traffic control)				$ 31,460
SUBTOTAL				$ 39,325
CONTINGENCY			30%	$ 11,798
TOTAL CONSTRUCTION COST				**$ 51,123**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 10,225
Construction Management, Inspection			15%	$ 7,668
TOTAL ENGINEERING / MANAGEMENT COST				**$ 17,893**
TOTAL CONSTRUCTION COST				$ 51,123
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 17,893
TOTAL PROJECT COSTS				**$ 69,015**

Notes:

Construction Cost Estimate

Project 1.6.A - Minkler Boulevard and Andover Park W: Intersection Improvement
Project Description: 1. Realign the eastbound approach of the intersection to squarely meeting the westbound approach.

Description	Quantity	Unit	Unit Cost	Total
Asphalt Concrete Pavement	9,900	SF	$ 2.80	$ 27,720
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	720	LF	$ 12.00	$ 8,640
Sidewalk	1,920	SF	$ 4.40	$ 8,448
Curb Ramps	8	EA	$ 1,500.00	$ 12,000
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	700	LF	$ 4.00	$ 2,800
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	480	LF	$ 40.00	$ 19,200
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	240	LF	$ 125.00	$ 30,000
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	1	EA	$ 200,000.00	$ 200,000
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	5,000	SF	$ 0.99	$ 4,950
Remove Curb and Gutter	720	LF	$ 10.00	$ 7,200
Remove Sidewalk/Parking Lot	9,920	SF	$ 1.90	$ 18,848
Mobilization (10% of Const. Subtotal)	1	LS	$ 33,981	$ 33,981
Traffic Control (5% of Const. Subtotal)	1	LS	$ 16,990	$ 16,990
SUBTOTAL (w/o mobilization and traffic control)				$ 339,806
SUBTOTAL				$ 390,777
CONTINGENCY			30%	$ 117,233
TOTAL CONSTRUCTION COST				**$ 508,010**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	5,000	SF	$ 65	$ 325,000
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
Parking Removal	27	EA	$ 20,000	$ 540,000
TOTAL RIGHT OF WAY COST				**$ 865,000**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 101,602
Construction Management, Inspection			15%	$ 76,201
TOTAL ENGINEERING / MANAGEMENT COST				**$ 177,803**
TOTAL CONSTRUCTION COST				$ 508,010
TOTAL RIGHT OF WAY COST				$ 865,000
TOTAL ENGINEERING / MANAGEMENT COST				$ 177,803
TOTAL PROJECT COSTS				**$ 1,550,813**

Notes:
Realignment would occur on private property.

Construction Cost Estimate

Project 1.7.B - Minkler Boulevard from Andover Park W to W Valley Highway: Roadway Extension
Project Description: Widen roadway to four-to-five lanes between Andover Parkway W and West Valley Highway, including bike lanes, sidewalks, new bridge over the Green River, and new traffic signal at West Valley Highway.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	89,250	SF	$ 2.80	$ 249,900
Asphalt Concrete Overlay	70,125	SF	$ 0.18	$ 12,623
Structure	45,240	SF	$ 230.00	$ 10,405,200
Earthwork	55,000	LF	$ 90.00	$ 4,950,000
Curb and Gutter	4,250	LF	$ 12.00	$ 51,000
Sidewalk	30,140	SF	$ 4.40	$ 132,616
Curb Ramps	20	EA	$ 1,500.00	$ 30,000
Lighting	2,705	LF	$ 65.00	$ 175,825
Signing and Striping	2,705	LF	$ 4.00	$ 10,820
Storm Drainage - New	375	LF	$ 130.00	$ 48,750
Storm Drainage - Modify	1,750	LF	$ 40.00	$ 70,000
Storm Drainage - Containment	2,705	LF	$ 80.00	$ 216,400
Landscaping / Irrigation - Planters & Restoration	2,125	LF	$ 125.00	$ 265,625
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	4	EA	$ 200,000.00	$ 800,000
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	1	EA	$ 400,000.00	$ 400,000
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	1,875	LF	$ 10.00	$ 18,750
Remove Sidewalk	250	SF	$ 1.90	$ 475
Mobilization (10% of Const. Subtotal)	1	LS	$ 1,783,798	$ 1,783,798
Traffic Control (5% of Const. Subtotal)	1	LS	$ 891,899	$ 891,899
SUBTOTAL (w/o mobilization and traffic control)				$ 17,837,984
SUBTOTAL				$ 20,513,681
CONTINGENCY			30%	$ 6,154,104
TOTAL CONSTRUCTION COST				**$ 26,667,785**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	34,125	SF	$ 65	$ 2,218,125
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	1	EA	$ 220,000	$ 220,000
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ 2,438,125**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 5,333,557
Construction Management, Inspection			15%	$ 4,000,168
TOTAL ENGINEERING / MANAGEMENT COST				**$ 9,333,725**
TOTAL CONSTRUCTION COST				$ 26,667,785
TOTAL RIGHT OF WAY COST				$ 2,438,125
TOTAL ENGINEERING / MANAGEMENT COST				$ 9,333,725
TOTAL PROJECT COSTS				**$ 38,439,635**

Notes:
City owns property on west side of Green River.

Construction Cost Estimate

Project 1.8.A - Andover Park E from Minkler Boulevard to Strander Boulevard: Bicycle Facility

Project Description: Restripe the traffic lanes on Andover Parkway E between Minkler Boulevard and Strander Boulevard Street from four to three lanes.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	117,000	SF	$ 0.18	$ 21,060
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	0	LF	$ 12.00	$ -
Sidewalk	0	SF	$ 4.40	$ -
Curb Ramps	0	EA	$ 1,500.00	$ -
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	2,600	LF	$ 4.00	$ 10,400
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Sidewalk	0	SF	$ 1.90	$ -
Mobilization (20% of Const. Subtotal)	1	LS	$ 6,292	$ 6,292
Traffic Control (5% of Const. Subtotal)	1	LS	$ 1,573	$ 1,573
SUBTOTAL (w/o mobilization and traffic control)				$ 31,460
SUBTOTAL				$ 39,325
CONTINGENCY			30%	$ 11,798
TOTAL CONSTRUCTION COST				**$ 51,123**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 10,225
Construction Management, Inspection			15%	$ 7,668
TOTAL ENGINEERING / MANAGEMENT COST				**$ 17,893**
TOTAL CONSTRUCTION COST				$ 51,123
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 17,893
TOTAL PROJECT COSTS				**$ 69,015**

Notes:

Construction Cost Estimate

Project 1.9.C - W Valley Highway from Strander Boulevard to S 180th Street: Sidewalk Improvement

Project Description: Require property owners along this corridor to provide sidewalk as redevelopment occurs; the improvements are not recommended as a City project, and have no direct City cost.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	0	LF	$ 12.00	$ -
Sidewalk	0	SF	$ 4.40	$ -
Curb Ramps	0	EA	$ 1,500.00	$ -
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	0	LF	$ 4.00	$ -
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Sidewalk	0	SF	$ 1.90	$ -
Mobilization (20% of Const. Subtotal)	1	LS	$ -	$ -
Traffic Control (5% of Const. Subtotal)	1	LS	$ -	$ -
SUBTOTAL (w/o mobilization and traffic control)				$ -
SUBTOTAL				$ -
CONTINGENCY			30%	$ -
TOTAL CONSTRUCTION COST				**$ -**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ -
Construction Management, Inspection			15%	$ -
TOTAL ENGINEERING / MANAGEMENT COST				**$ -**
TOTAL CONSTRUCTION COST				$ -
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ -
TOTAL PROJECT COSTS				**$ -**

Notes:

Construction Cost Estimate

Project 1.10.C - S 168th (Pond) Street from Southcenter Boulevard to Andover Park E: New Street Construction
Project Description: Construct new two-lane street with sidewalks, planter strip and on-street parking.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	120,000	SF	$ 2.80	$ 336,000
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	3,000	LF	$ 90.00	$ 270,000
Curb and Gutter	6,000	LF	$ 12.00	$ 72,000
Sidewalk	54,000	SF	$ 4.40	$ 237,600
Curb Ramps	30	EA	$ 1,500.00	$ 45,000
Lighting	3,000	LF	$ 65.00	$ 195,000
Signing and Striping	3,000	LF	$ 4.00	$ 12,000
Storm Drainage - New	3,000	LF	$ 130.00	$ 390,000
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	3,000	LF	$ 80.00	$ 240,000
Landscaping		SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	3,000	LF	$ 125.00	$ 375,000
Retaining Walls	0	SF	$ 120.00	$ -
Fence	1,500	LF	$ 35.00	$ 52,500
Railing	0	LF	$ 55.00	$ -
New Signal	3	EA	$ 200,000.00	$ 600,000
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Asphalt/Concrete	120,000	SF	$ 1.90	$ 228,000
Mobilization (10% of Const. Subtotal)	1	LS	$ 305,310	$ 305,310
Traffic Control (5% of Const. Subtotal)	1	LS	$ 152,655	$ 152,655
SUBTOTAL (w/o mobilization and traffic control)				$ 3,053,100
SUBTOTAL				$ 3,511,065
CONTINGENCY			30%	$ 1,053,320
TOTAL CONSTRUCTION COST				**$ 4,564,385**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	120,000	SF	$ 65	$ 7,800,000
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	1	EA	$ 3,463,800	$ 3,463,800
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ 11,263,800**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 912,877
Construction Management, Inspection			15%	$ 684,658
TOTAL ENGINEERING / MANAGEMENT COST				**$ 1,597,535**
TOTAL CONSTRUCTION COST				$ 4,564,385
TOTAL RIGHT OF WAY COST				$ 11,263,800
TOTAL ENGINEERING / MANAGEMENT COST				$ 1,597,535
TOTAL PROJECT COSTS				**$ 17,425,719**

Notes:
3,000 feet of new road.
Design based on recommendations in the Tukwila Urban Center Plan. TIP cost estimate at $23M.

Construction Cost Estimate

Project 1.11.A - Treck Drive from Andover Park W to Andover Park E: New Street Construction

Project Description: Extend Treck Drive to provide a connection between Andover Park W and Andover Park E

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	21,840	SF	$ 2.80	$ 61,152
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	830	LF	$ 12.00	$ 9,960
Sidewalk	0	SF	$ 4.40	$ -
Curb Ramps	2	EA	$ 1,500.00	$ 3,000
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	546	LF	$ 4.00	$ 2,184
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	1,090	LF	$ 125.00	$ 136,250
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	1	EA	$ 200,000.00	$ 200,000
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	23,900	SF	$ 0.99	$ 23,661
Remove Curb and Gutter	700	LF	$ 10.00	$ 7,000
Remove Roadway	23,900	SF	$ 1.90	$ 45,410
Mobilization (10% of Const. Subtotal)	1	LS	$ 48,862	$ 48,862
Traffic Control (5% of Const. Subtotal)	1	LS	$ 24,431	$ 24,431
SUBTOTAL (w/o mobilization and traffic control)				$ 488,617
SUBTOTAL				$ 561,910
CONTINGENCY			30%	$ 168,573
TOTAL CONSTRUCTION COST				**$ 730,482**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	14520	SF	$ 65	$ 943,800
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ 943,800**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 146,096
Construction Management, Inspection			15%	$ 109,572
TOTAL ENGINEERING / MANAGEMENT COST				**$ 255,669**
TOTAL CONSTRUCTION COST				$ 730,482
TOTAL RIGHT OF WAY COST				$ 943,800
TOTAL ENGINEERING / MANAGEMENT COST				$ 255,669
TOTAL PROJECT COSTS				**$ 1,929,951**

Notes:

Construction Cost Estimate

Project 1.12.A - Green River and Interurban Trails from West Valley Highway: Bicycle Facility
Project Description: Construct improvements to the Green River Trail near S 180th Street. Provide wayfinding signs at 10 locations.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	3,600	SF	$ 2.80	$ 10,080
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	0	LF	$ 12.00	$ -
Sidewalk	0	SF	$ 4.40	$ -
Curb Ramps	0	EA	$ 1,500.00	$ -
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	3,750	LF	$ 4.00	$ 65,000
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	3,600	SF	$ 0.99	$ 3,564
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Sidewalk	0	SF	$ 1.90	$ -
Mobilization (20% of Const. Subtotal)	1	LS	$ 15,729	$ 15,729
Traffic Control (5% of Const. Subtotal)	1	LS	$ 3,932	$ 3,932
SUBTOTAL (w/o mobilization and traffic control)				$ 78,644
SUBTOTAL				$ 98,305
CONTINGENCY			30%	$ 29,492
TOTAL CONSTRUCTION COST				**$ 127,797**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 25,559
Construction Management, Inspection			15%	$ 19,169
TOTAL ENGINEERING / MANAGEMENT COST				**$ 44,729**
TOTAL CONSTRUCTION COST				$ 127,797
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 44,729
TOTAL PROJECT COSTS				**$ 172,525**

Notes:
Work with property owners along the east side of West Valley Highway to gain more access to the Interurban Trail between Strander Boulevard and S 180th Street.

Construction Cost Estimate

Project 1.13.B - Strander Boulevard and W Valley Highway: Intersection Improvement
Project Description: Modify the proposed Strander Boulevard extension project design to add a westbound to northbound right turn lane, widen the eastbound approach to include two left turn lanes, a through lane, and a shared through-right lane, and add sidewalks on the south side of Strander Boulevard between the Green River bridge and the east City Limit.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	12,600	SF	$ 2.80	$ 35,280
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	1,050	LF	$ 90.00	$ 94,500
Curb and Gutter	350	LF	$ 12.00	$ 4,200
Sidewalk	2,100	SF	$ 4.40	$ 9,240
Curb Ramps	2	EA	$ 1,500.00	$ 3,000
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	0	LF	$ 4.00	$ -
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	350	LF	$ 40.00	$ 14,000
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	4,375	SF	$ 120.00	$ 525,000
Fence	0	LF	$ 35.00	$ -
Railing	350	LF	$ 55.00	$ 19,250
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	1	EA	$ 75,000.00	$ 75,000
Seismic Improvements	0	Each	$ 400,000.00	$ -
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	350	LF	$ 10.00	$ 3,500
Remove Sidewalk	0	SF	$ 1.90	$ -
Mobilization (10% of Const. Subtotal)	1	LS	$ 78,297	$ 78,297
Traffic Control (5% of Const. Subtotal)	1	LS	$ 39,149	$ 39,149
SUBTOTAL (w/o mobilization and traffic control)				$ 782,970
SUBTOTAL				$ 900,416
CONTINGENCY			30%	$ 270,125
TOTAL CONSTRUCTION COST				**$ 1,170,540**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	14000	SF	$ 65	$ 910,000
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ 910,000**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 234,108
Construction Management, Inspection			15%	$ 175,581
TOTAL ENGINEERING / MANAGEMENT COST				**$ 409,689**
TOTAL CONSTRUCTION COST				$ 1,170,540
TOTAL RIGHT OF WAY COST				$ 910,000
TOTAL ENGINEERING / MANAGEMENT COST				$ 409,689
TOTAL PROJECT COSTS				**$ 2,490,000**

Notes:
Per an interlocal agreement, Tukwila and Renton will split the project costs equally.
Total project cost at $37 million, in addition to the costs identified above.

Construction Cost Estimate
Project 1.15.B - Baker Boulevard from Andover Park W to W Valley Highway: Pedestrian and Bicycle Facility Improvement

Project Description: Restripe the traffic lanes on Baker Boulevard from Andover Park West to W Valley Highway to provide bicycle lanes

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	70,000	SF	$ 0.18	$ 12,600
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	0	LF	$ 12.00	$ -
Sidewalk	0	SF	$ 4.40	$ -
Curb Ramps	0	EA	$ 1,500.00	$ -
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	1,400	LF	$ 4.00	$ 5,600
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Sidewalk	0	SF	$ 1.90	$ -
Mobilization (20% of Const. Subtotal)	1	LS	$ 3,640	$ 3,640
Traffic Control (5% of Const. Subtotal)	1	LS	$ 910	$ 910
SUBTOTAL (w/o mobilization and traffic control)				$ 18,200
SUBTOTAL				$ 22,750
CONTINGENCY			30%	$ 6,825
TOTAL CONSTRUCTION COST				**$ 29,575**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 5,915
Construction Management, Inspection			15%	$ 4,436
TOTAL ENGINEERING / MANAGEMENT COST				**$ 10,351**
TOTAL CONSTRUCTION COST				$ 29,575
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 10,351
TOTAL PROJECT COSTS				**$ 8,759,926**

Notes:
Includes TIP project costs for Baker Boulevard trail and Green River Bridge ($7.6 million) and Southcenter/ Urban Center Pedestrian Improvements ($1.1 million)

Construction Cost Estimate

Project 1.16.C - I-5 Northbound Off-Ramp and Southcenter Parkway: Intersection Improvement
Project Description: Realign the westbound approach of the intersection to squarely meet the eastbound approach. Eliminate eastbound and westbound split phasing, and add a new westbound lane.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	18,000	SF	$ 2.80	$ 50,400
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	600	LF	$ 90.00	$ 54,000
Curb and Gutter	500	LF	$ 12.00	$ 6,000
Sidewalk	1,800	SF	$ 4.40	$ 7,920
Curb Ramps	3	EA	$ 1,500.00	$ 4,500
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	350	LF	$ 4.00	$ 1,400
Storm Drainage - New	80	LF	$ 130.00	$ 10,400
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	600	LF	$ 125.00	$ 75,000
Retaining Walls	1,800	SF	$ 120.00	$ 216,000
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	1	EA	$ 75,000.00	$ 75,000
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	18,000	SF	$ 0.99	$ 17,820
Remove Curb and Gutter	900	LF	$ 10.00	$ 9,000
Remove Sidewalk	1,800	SF	$ 1.90	$ 3,420
Mobilization (10% of Const. Subtotal)	1	LS	$ 53,086	$ 53,086
Traffic Control (5% of Const. Subtotal)	1	LS	$ 26,543	$ 26,543
SUBTOTAL (w/o mobilization and traffic control)				$ 530,860
SUBTOTAL				$ 610,489
CONTINGENCY			30%	$ 183,147
TOTAL CONSTRUCTION COST				**$ 793,636**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 158,727
Construction Management, Inspection			15%	$ 119,045
TOTAL ENGINEERING / MANAGEMENT COST				**$ 277,772**
TOTAL CONSTRUCTION COST				$ 793,636
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 277,772
TOTAL PROJECT COSTS				**$ 1,071,000**

Notes:
Project will require coordination with Southcenter Mall owner and potentially WSDOT.

Construction Cost Estimate

Project 1.18.A - Andover Park E from Strander Boulevard to Tukwila Parkway: Bicycle Facility Improvement

Project Description: Construct bicycle lanes along Andover Park E between Tukwila Parkway and Strander Boulevard by creating two travel lanes with a center two-way left turn lane.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	0	LF	$ 12.00	$ -
Sidewalk	0	SF	$ 4.40	$ -
Curb Ramps	0	EA	$ 1,500.00	$ -
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	2,016	LF	$ 4.00	$ 8,064
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	3	EA	$ 75,000.00	$ 225,000
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Roadway	0	SF	$ 1.90	$ -
Mobilization (10% of Const. Subtotal)	1	LS	$ 23,306	$ 23,306
Traffic Control (5% of Const. Subtotal)	1	LS	$ 11,653	$ 11,653
SUBTOTAL (w/o mobilization and traffic control)				$ 233,064
SUBTOTAL				$ 268,024
CONTINGENCY			30%	$ 80,407
TOTAL CONSTRUCTION COST				**$ 348,431**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 69,686
Construction Management, Inspection			15%	$ 52,265
TOTAL ENGINEERING / MANAGEMENT COST				**$ 121,951**
TOTAL CONSTRUCTION COST				$ 348,431
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 121,951
TOTAL PROJECT COSTS				**$ 470,381**

Notes:
Alternative 2

Construction Cost Estimate

Project 1.19.B - Tukwila Parkway and 61st Avenue S: Intersection Improvement
Project Description: Add a raised island to southbound approach to allow free right turns. Add a C-curb west of the island to prevent any lane changes to turn into the first Southcenter Mall entrance west of 61st Avenue S.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Asphalt Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	575	LF	$ 12.00	$ 6,900
Sidewalk	300	SF	$ 4.40	$ 1,320
Curb Ramps	0	EA	$ 1,500.00	$ -
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	0	LF	$ 4.00	$ -
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	1	EA	$ 75,000.00	$ 75,000
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Asphalt/Concrete	600	SF	$ 1.90	$ 1,140
Mobilization (20% of Const. Subtotal)	1	LS	$ 16,872	$ 16,872
Traffic Control (5% of Const. Subtotal)	1	LS	$ 4,218	$ 4,218
SUBTOTAL (w/o mobilization and traffic control)				$ 84,360
SUBTOTAL				$ 105,450
CONTINGENCY			30%	$ 31,635
TOTAL CONSTRUCTION COST				**$ 137,085**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 27,417
Construction Management, Inspection			15%	$ 20,563
TOTAL ENGINEERING / MANAGEMENT COST				**$ 47,980**
TOTAL CONSTRUCTION COST				$ 137,085
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 47,980
TOTAL PROJECT COSTS				**$ 185,065**

Notes:
Mall owner would be responsible for the new roadway entering the Southcenter Mall parking lot.

Construction Cost Estimate

Project 1.21.C - Tukwila Parkway from 66th Avenue S to W Valley Highway: Roadway Extension
Project Description: WSDOT project to be constructed as part of future I-405 widening. Extend Tukwila Parkway from 68th Avenue S to West Valley Highway.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	73,810	SF	$ 2.80	$ 206,668
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	33,000	SF	$ 230.00	$ 7,590,000
Earthwork	2,460	LF	$ 90.00	$ 221,400
Curb and Gutter	2,460	LF	$ 12.00	$ 29,520
Sidewalk	19,680	SF	$ 4.40	$ 86,592
Curb Ramps	20	EA	$ 1,500.00	$ 30,000
Lighting	1,230	LF	$ 65.00	$ 79,950
Signing and Striping	1,230	LF	$ 4.00	$ 4,920
Storm Drainage - New	1,230	LF	$ 130.00	$ 159,900
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	1,230	LF	$ 80.00	$ 98,400
Landscaping		SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	2,460	LF	$ 125.00	$ 307,500
Retaining Walls	15,000	SF	$ 120.00	$ 1,800,000
Fence	1,000	LF	$ 35.00	$ 35,000
Railing	2,000	LF	$ 55.00	$ 110,000
New Signal	3	EA	$ 200,000.00	$ 600,000
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	1	EA	$ 400,000.00	$ 400,000
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Sidewalk	0	SF	$ 1.90	$ -
Mobilization (10% of Const. Subtotal)	1	LS	$ 1,175,985	$ 1,175,985
Traffic Control (5% of Const. Subtotal)	1	LS	$ 587,993	$ 587,993
SUBTOTAL (w/o mobilization and traffic control)				$ 11,759,850
SUBTOTAL				$ 13,523,828
CONTINGENCY			30%	$ 4,057,148
TOTAL CONSTRUCTION COST				**$ 17,580,976**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	80,000	SF	$ 65	$ 5,200,000
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	1	EA	$ 572,400	$ 572,400
TOTAL RIGHT OF WAY COST				**$ 5,772,400**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 3,516,195
Construction Management, Inspection			15%	$ 2,637,146
TOTAL ENGINEERING / MANAGEMENT COST				**$ 6,153,342**
TOTAL CONSTRUCTION COST				$ 17,580,976
TOTAL RIGHT OF WAY COST				$ 5,772,400
TOTAL ENGINEERING / MANAGEMENT COST				$ 6,153,342
TOTAL PROJECT COSTS				**$ 29,506,717**

Notes:
Structure costs based on WSDOT estimate and do not include the ramp connections to I-405.

Construction Cost Estimate

Project 1.22.C - Southcenter Boulevard and I-405 Southbound Off-Ramp: Intersection Improvement
Project Description: Coordinate with WSDOT to add a new signal. The intersection is controlled by WSDOT and WSDOT would be responsible for the cost of a new signal.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	0	LF	$ 12.00	$ -
Sidewalk	0	SF	$ 4.40	$ -
Curb Ramps	0	EA	$ 1,500.00	$ -
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	0	LF	$ 4.00	$ -
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	1	EA	$ 200,000.00	$ 200,000
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Sidewalk	0	SF	$ 1.90	$ -
Mobilization (20% of Const. Subtotal)	1	LS	$ 40,000	$ 40,000
Traffic Control (5% of Const. Subtotal)	1	LS	$ 10,000	$ 10,000
SUBTOTAL (w/o mobilization and traffic control)				$ 200,000
SUBTOTAL				$ 250,000
CONTINGENCY			30%	$ 75,000
TOTAL CONSTRUCTION COST				**$ 325,000**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 65,000
Construction Management, Inspection			15%	$ 48,750
TOTAL ENGINEERING / MANAGEMENT COST				**$ 113,750**
TOTAL CONSTRUCTION COST				$ 325,000
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 113,750
TOTAL PROJECT COSTS				**$ 438,750**

Notes:
Assumes minimal modification to the intersection other than new signal.

Construction Cost Estimate
Project 1.24.A - Southcenter Boulevard from 61st Avenue S to 62nd Avenue S: Sidewalk and Crosswalk Improvement
Project Description: Add a sidewalk on the south side of Southcenter Boulevard between 61st Avenue S Bridge and 62nd Avenue S. New crosswalks at 62nd Avenue S.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	0	LF	$ 12.00	$ -
Sidewalk	2,760	SF	$ 4.40	$ 12,144
Curb Ramps	10	EA	$ 1,500.00	$ 15,000
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	100	LF	$ 4.00	$ 400
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	1,500	SF	$ 0.99	$ 1,485
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Sidewalk	0	SF	$ 1.90	$ -
Mobilization (20% of Const. Subtotal)	1	LS	$ 5,806	$ 5,806
Traffic Control (5% of Const. Subtotal)	1	LS	$ 1,451	$ 1,451
SUBTOTAL (w/o mobilization and traffic control)				$ 29,029
SUBTOTAL				$ 36,286
CONTINGENCY			30%	$ 10,886
TOTAL CONSTRUCTION COST				**$ 47,172**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 9,434
Construction Management, Inspection			15%	$ 7,076
TOTAL ENGINEERING / MANAGEMENT COST				**$ 16,510**
TOTAL CONSTRUCTION COST				$ 47,172
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 16,510
TOTAL PROJECT COSTS				**$ 63,682**

Notes:

Construction Cost Estimate

Project 1.25.B - Southcenter Boulevard and 65th Avenue S: Crosswalk Improvement
Project Description: Add a sidewalk on the south side of Southcenter Boulevard near 65th Avenue S. New crosswalks at 65th Ave S.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	0	LF	$ 12.00	$ -
Sidewalk	420	SF	$ 4.40	$ 1,848
Curb Ramps	4	EA	$ 1,500.00	$ 6,000
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	100	LF	$ 4.00	$ 400
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	1,200	SF	$ 120.00	$ 144,000
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	1,500	SF	$ 0.99	$ 1,485
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Sidewalk	0	SF	$ 1.90	$ -
Mobilization (20% of Const. Subtotal)	1	LS	$ 30,747	$ 30,747
Traffic Control (5% of Const. Subtotal)	1	LS	$ 7,687	$ 7,687
SUBTOTAL (w/o mobilization and traffic control)				$ 153,733
SUBTOTAL				$ 192,166
CONTINGENCY			30%	$ 57,650
TOTAL CONSTRUCTION COST				**$ 249,816**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 49,963
Construction Management, Inspection			15%	$ 37,472
TOTAL ENGINEERING / MANAGEMENT COST				**$ 87,436**
TOTAL CONSTRUCTION COST				$ 249,816
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 87,436
TOTAL PROJECT COSTS				**$ 337,252**

Notes:
Project costs include new retaining wall at the 65th Avenue intersection.

Construction Cost Estimate

Project 1.26.A - Southcenter Boulevard and 66th Avenue S: Intersection Improvement

Project Description: Restripe westbound approach lane configuration to one through lane and two left turn lanes.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	14,400	SF	$ 0.18	$ 2,592
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	0	LF	$ 12.00	$ -
Sidewalk	0	SF	$ 4.40	$ -
Curb Ramps	0	EA	$ 1,500.00	$ -
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	400	LF	$ 4.00	$ 1,600
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	0	EA	$ 75,000.00	$ 18,750
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Sidewalk	0	SF	$ 1.90	$ -
Mobilization (20% of Const. Subtotal)	1	LS	$ 4,588	$ 4,588
Traffic Control (5% of Const. Subtotal)	1	LS	$ 1,147	$ 1,147
SUBTOTAL (w/o mobilization and traffic control)				$ 22,942
SUBTOTAL				$ 28,678
CONTINGENCY			30%	$ 8,603
TOTAL CONSTRUCTION COST				**$ 37,281**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 7,456
Construction Management, Inspection			15%	$ 5,592
TOTAL ENGINEERING / MANAGEMENT COST				**$ 13,048**
TOTAL CONSTRUCTION COST				$ 37,281
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 13,048
TOTAL PROJECT COSTS				**$ 50,329**

Notes:
Restripe 400 feet of Southcenter Boulevard. Short-term project.
Replace westbound loop detector and signal head.

Construction Cost Estimate

Project 1.27.B - Southcenter Boulevard and W Valley Highway: Intersection Improvement
Project Description: Modify the southbound channelized right turn lane by reducing the corner radius of the lane. Add textured crosswalks to eastbound and northbound approaches to the intersection.

Description	Quantity	Unit	Unit Cost	Total
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	350	LF	$ 12.00	$ 4,200
Sidewalk	1,500	SF	$ 4.40	$ 6,600
Curb Ramps	9	EA	$ 1,500.00	$ 13,500
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	550	LF	$ 4.00	$ 2,200
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	310	LF	$ 40.00	$ 12,400
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	5,000	SF	$ 7.00	$ 35,000
Landscaping / Irrigation - Planters & Restoration	100	LF	$ 125.00	$ 12,500
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	20,000	SF	$ 0.99	$ 19,800
Remove Curb and Gutter	225	LF	$ 10.00	$ 2,250
Remove Sidewalk	2500	SF	$ 1.90	$ 4,750
Mobilization (20% of Const. Subtotal)	1	LS	$ 22,640	$ 22,640
Traffic Control (5% of Const. Subtotal)	1	LS	$ 5,660	$ 5,660
SUBTOTAL (w/o mobilization and traffic control)				$ 113,200
SUBTOTAL				$ 141,500
CONTINGENCY			30%	$ 42,450
TOTAL CONSTRUCTION COST				**$ 183,950**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 36,790
Construction Management, Inspection			15%	$ 27,593
TOTAL ENGINEERING / MANAGEMENT COST				**$ 64,383**
TOTAL CONSTRUCTION COST				$ 183,950
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 64,383
TOTAL PROJECT COSTS				**$ 248,333**

Notes:
WSDOT Right of Way.

Construction Cost Estimate

Project 3.2.B - Klickitat Drive from 53rd Avenue S to Southcenter Parkway: Walkway Improvement

Project Description: Extend the multi-use trail from 53rd Avenue S to the Southcenter Boulevard bridge. Enhance the existing multi-use trail with pedestrian lighting and shorter fence.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	1,900	SF	$ 230.00	$ 437,000
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	1,260	LF	$ 12.00	$ 15,120
Sidewalk	12,600	SF	$ 4.40	$ 55,440
Curb Ramps	10	EA	$ 1,500.00	$ 15,000
Lighting	3,500	LF	$ 65.00	$ 227,500
Signing and Striping	0	LF	$ 4.00	$ -
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	0	SF	$ 120.00	$ -
Fence	1,600	LF	$ 35.00	$ 56,000
Railing	310	LF	$ 55.00	$ 17,050
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	12,600	SF	$ 0.99	$ 12,474
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Sidewalk	0	SF	$ 1.90	$ -
Mobilization (10% of Const. Subtotal)	1	LS	$ 83,558	$ 83,558
Traffic Control (5% of Const. Subtotal)	1	LS	$ 41,779	$ 41,779
SUBTOTAL (w/o mobilization and traffic control)				$ 835,584
SUBTOTAL				$ 960,922
CONTINGENCY			30%	$ 288,276
TOTAL CONSTRUCTION COST				**$ 1,249,198**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 249,840
Construction Management, Inspection			15%	$ 187,380
TOTAL ENGINEERING / MANAGEMENT COST				**$ 437,219**
TOTAL CONSTRUCTION COST				$ 1,249,198
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 437,219
TOTAL PROJECT COSTS				**$ 1,686,417**

Notes:
Assumes existing structure can accommodate trail. Need to confirm with WSDOT.
New bridge structure would cost $5-10M. Coordinate with the WSDOT to widen the overpass.

Construction Cost Estimate

Project 3.15.B - S 141st Street from Tukwila International Boulevard to 42nd Avenue S: Sidewalk Improvement

Project Description: Add a 6 foot sidewalk on the south side of S 141st Street between Tukwila International Boulevard and 42nd Avenue S.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	510	LF	$ 12.00	$ 6,120
Sidewalk	3,060	SF	$ 4.40	$ 13,464
Curb Ramps	4	EA	$ 1,500.00	$ 6,000
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	0	LF	$ 4.00	$ -
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	510	LF	$ 40.00	$ 20,400
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	0	SF	$ 7.00	$ -
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	0	SF	$ 0.99	$ -
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Sidewalk	0	SF	$ 1.90	$ -
Mobilization (10% of Const. Subtotal)	1	LS	$ 4,598	$ 4,598
Traffic Control (5% of Const. Subtotal)	1	LS	$ 2,299	$ 2,299
SUBTOTAL (w/o mobilization and traffic control)				$ 45,984
SUBTOTAL				$ 52,882
CONTINGENCY			30%	$ 15,864
TOTAL CONSTRUCTION COST				**$ 68,746**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 13,749
Construction Management, Inspection			15%	$ 10,312
TOTAL ENGINEERING / MANAGEMENT COST				**$ 24,061**
TOTAL CONSTRUCTION COST				$ 68,746
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 24,061
TOTAL PROJECT COSTS				**$ 92,807**

Notes:

This is an adjustment to Walk & Roll project P3. That project widened the road and added sidewalks to both sides, requiring ROW and a fill wall. This project adds a sidewalk on one side only.

Construction Cost Estimate

Project 3.22.B - E Marginal Way/40th Avenue S and S 130th Street: Intersection Improvement

Project Description: Re-align 40th Avenue S and create a new unsignalized intersection at E Marginal Way south of the intersection with S 130th Street.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	80	LF	$ 90.00	$ 7,200
Curb and Gutter	240	LF	$ 12.00	$ 2,880
Sidewalk	1,100	SF	$ 4.40	$ 4,840
Curb Ramps	8	EA	$ 1,500.00	$ 12,000
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	300	LF	$ 4.00	$ 1,200
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	250	LF	$ 40.00	$ 10,000
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	3,300	SF	$ 7.00	$ 23,100
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	0	EA	$ 75,000.00	$ -
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation	3,300	SF	$ 0.99	$ 3,267
Remove Curb and Gutter	350	LF	$ 10.00	$ 3,500
Remove Roadway	3300	SF	$ 1.90	$ 6,270
Mobilization (20% of Const. Subtotal)	1	LS	$ 14,851	$ 14,851
Traffic Control (5% of Const. Subtotal)	1	LS	$ 3,713	$ 3,713
SUBTOTAL (w/o mobilization and traffic control)				$ 74,257
SUBTOTAL				$ 92,821
CONTINGENCY			30%	$ 27,846
TOTAL CONSTRUCTION COST				**$ 120,668**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 24,134
Construction Management, Inspection			15%	$ 18,100
TOTAL ENGINEERING / MANAGEMENT COST				**$ 42,234**
TOTAL CONSTRUCTION COST				$ 120,668
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 42,234
TOTAL PROJECT COSTS				**$ 162,901**

Notes:

Construction Cost Estimate
Project 4.3.C - S Boeing Access Road and E Marginal Way S/Tukwila International Boulevard: Intersection Improvement

Project Description: Redesign the intersection by restricting the northbound movement on E Marginal Way S to right turn only.

Description	**Quantity**	**Unit**	**Unit Cost**	**Total**
Asphalt Concrete Pavement	0	SF	$ 2.80	$ -
Asphalt Concrete Overlay	0	SF	$ 0.18	$ -
Structure	0	SF	$ 230.00	$ -
Earthwork	0	LF	$ 90.00	$ -
Curb and Gutter	600	LF	$ 12.00	$ 7,200
Sidewalk	2,100	SF	$ 4.40	$ 9,240
Curb Ramps	3	EA	$ 1,500.00	$ 4,500
Lighting	0	LF	$ 65.00	$ -
Signing and Striping	500	LF	$ 4.00	$ 2,000
Storm Drainage - New	0	LF	$ 130.00	$ -
Storm Drainage - Modify	0	LF	$ 40.00	$ -
Storm Drainage - Containment	0	LF	$ 80.00	$ -
Landscaping	2,000	SF	$ 7.00	$ 14,000
Landscaping / Irrigation - Planters & Restoration	0	LF	$ 125.00	$ -
Retaining Walls	0	SF	$ 120.00	$ -
Fence	0	LF	$ 35.00	$ -
Railing	0	LF	$ 55.00	$ -
New Signal	0	EA	$ 200,000.00	$ -
Modify Signal	1	EA	$ 75,000.00	$ 75,000
Seismic Improvements	0	EA	$ 400,000.00	$ -
Excavation - Roadway	2,100	SF	$ 0.99	$ 2,079
Remove Curb and Gutter	0	LF	$ 10.00	$ -
Remove Roadway	2,100	SF	$ 1.90	$ 3,990
Mobilization (20% of Const. Subtotal)	1	LS	$ 23,602	$ 23,602
Traffic Control (5% of Const. Subtotal)	1	LS	$ 5,900	$ 5,900
SUBTOTAL (w/o mobilization and traffic control)				$ 118,009
SUBTOTAL				$ 147,511
CONTINGENCY			30%	$ 44,253
TOTAL CONSTRUCTION COST				**$ 191,765**
RIGHT OF WAY COST ESTIMATE				
Land - Commercial	0	SF	$ 65	$ -
Land - Residential	0	SF	$ 35	$ -
Building - Commercial	0	EA	$ 1,000,000	$ -
Building - Residential	0	EA	$ 250,000	$ -
TOTAL RIGHT OF WAY COST				**$ -**
ENGINEERING / MANAGEMENT COST ESTIMATE				
Design, Survey			20%	$ 38,353
Construction Management, Inspection			15%	$ 28,765
TOTAL ENGINEERING / MANAGEMENT COST				**$ 67,118**
TOTAL CONSTRUCTION COST				$ 191,765
TOTAL RIGHT OF WAY COST				$ -
TOTAL ENGINEERING / MANAGEMENT COST				$ 67,118
TOTAL PROJECT COSTS				**$ 258,882**

Notes:
Construct raised island to restrict northbound movement to right turn only.

Construction Cost Estimate
Project 4.4.B - S Boeing Access Road from Martin Luther King Junior Way S to E Marginal Way S: Walkway Improvement
Project Description: Construct sidewalks on the north side of S Boeing Access Road from Martin Luther King Jr Way S to E Marginal Way S. Re-align the southbound ramps from I-5 and Airport Way S that connect with S Boeing Access Road by creating right-angle intersections. TIP cost estimate to replace all bridges from Airport Way S to I-5 is $30.7 M.

Description	**Quantity**	**Unit**	**Unit Cost**		**Total**
Asphalt Concrete Pavement	11,600	SF	$ 2.80	$	32,480
Asphalt Concrete Overlay	0	SF	$ 0.18	$	-
Structure	0	SF	$ 230.00	$	-
Earthwork	800	LF	$ 90.00	$	72,000
Curb and Gutter	2,050	LF	$ 12.00	$	24,600
Sidewalk	18,600	SF	$ 4.40	$	81,840
Curb Ramps	8	EA	$ 1,500.00	$	12,000
Lighting	0	LF	$ 65.00	$	-
Signing and Striping	2,400	LF	$ 4.00	$	9,600
Storm Drainage - New	0	LF	$ 130.00	$	-
Storm Drainage - Modify	0	LF	$ 40.00	$	-
Storm Drainage - Containment	0	LF	$ 80.00	$	-
Landscaping		SF	$ 7.00	$	-
Landscaping / Irrigation - Planters & Restoration	1,600	LF	$ 125.00	$	200,000
Retaining Walls	1,000	SF	$ 120.00	$	120,000
Fence	0	LF	$ 35.00	$	-
Railing	0	LF	$ 55.00	$	-
New Signal	4	EA	$ 200,000.00	$	800,000
Modify Signal	0	EA	$ 75,000.00	$	-
Seismic Improvements	0	EA	$ 400,000.00	$	-
Excavation - Roadway	23,900	SF	$ 0.99	$	23,661
Remove Curb and Gutter	1,000	LF	$ 10.00	$	10,000
Remove Roadway	12,000	SF	$ 1.90	$	22,800
Mobilization (10% of Const. Subtotal)	1	LS	$ 140,898	$	140,898
Traffic Control (5% of Const. Subtotal)	1	LS	$ 70,449	$	70,449
SUBTOTAL (w/o mobilization and traffic control)				$	1,408,981
SUBTOTAL				$	1,620,328
CONTINGENCY			40%	$	648,131
TOTAL CONSTRUCTION COST				**$**	**2,268,459**
RIGHT OF WAY COST ESTIMATE					
Land - Commercial	0	SF	$ 65	$	-
Land - Residential	0	SF	$ 35	$	-
Building - Commercial	0	EA	$ 1,000,000	$	-
Building - Residential	0	EA	$ 250,000	$	-
TOTAL RIGHT OF WAY COST				**$**	**-**
ENGINEERING / MANAGEMENT COST ESTIMATE					
Design, Survey			20%	$	453,692
Construction Management, Inspection			15%	$	340,269
TOTAL ENGINEERING / MANAGEMENT COST				**$**	**793,961**
TOTAL CONSTRUCTION COST				$	2,268,459
TOTAL RIGHT OF WAY COST				$	-
TOTAL ENGINEERING / MANAGEMENT COST				$	793,961
TOTAL PROJECT COSTS				**$**	**3,062,420**

Notes:
Contingency raised to 40% because of work on structures. Cost assumes that existing structures can be retained. Sidewalks built on existing structure for I-5 and BNSF bridges, new sidewalks assumed to be constructed on Airport Way bridge.

APPENDIX F:

OTHER PROJECTS REVIEWED BUT NOT RECOMMENDED

F1. S 180th Street & West Valley Highway Intersection

The S 180th Street/West Valley Highway intersection operates at LOS F during existing PM peak hour conditions and would continue to operate at LOS F in 2030 if no action was taken. With the anticipated growth in Tukwila South, an even greater demand is expected to be placed on this intersection. As this intersection already has turn lanes on all approaches (with dual left turn lanes on the north and south approaches), it would be difficult to further add capacity at this location. Therefore, it is necessary to reduce the demand on this intersection by providing other facilities that would remove some of the demand from this intersection or shift traffic volumes to more efficient movements.

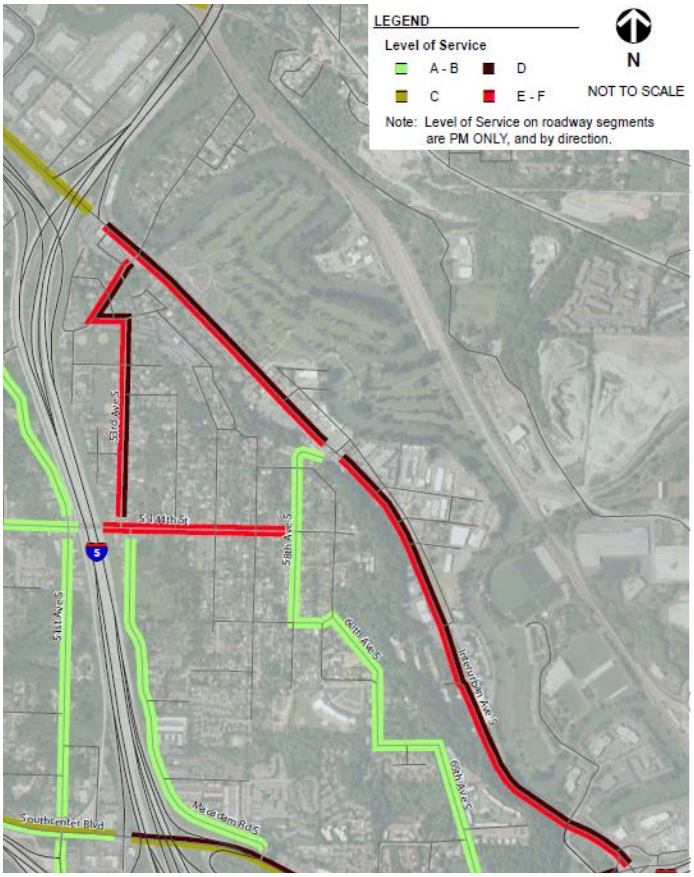
- 2010 level of service: LOS C (33 seconds of delay) in AM peak hour and LOS F (122 seconds of delay) in PM peak hour.
- 2030 level of service: LOS D (49 seconds of delay) in AM peak hour and LOS F (more than 150 seconds of delay) in PM peak hour.

The construction of the proposed Minkler Boulevard bridge serves to provide an alternative east-west connection over the Green River. The expected diversion would decrease volumes and delay at S 180th Street/West Valley Highway by approximately 50 seconds. However, the intersection would still operate at LOS F with more than 150 seconds of delay in the 2030 PM peak hour.

Perhaps the most substantial benefit to the additional east-west connections is more travel choice, not only for vehicle paths, but also pedestrian and bicycle circulation. Due to the high volumes on S 180th Street, alternate routes for bicycles and pedestrians are recommended and could be accommodated by the Minkler Boulevard extension.

Aerial photo of the S 180th Street/West Valley Highway intersection.

F2. Interurban Avenue S Bicycle Lanes



No on-street bicycle facilities are provided in this corridor. High vehicle speeds and volumes alongside the shoulders create an unfriendly bicycle environment. Between I-5 and 58th Avenue S the Green River Trail runs immediately adjacent to Interurban Avenue and therefore provides a viable alternative to on-street travel.

While the Green River Trail also parallels Interurban Avenue between 58th Avenue S and Southcenter Boulevard, it is more conducive to recreational riders than commuters because of its meandering alignment.

While bicycle lanes would improve conditions between 58th Avenue S and Southcenter Boulevard, no improvements are recommended since 90 percent design improvement plans for Interurban Avenue between 143rd Street and Fort Dent Way are already complete. These improvement plans show seven foot sidewalks on each side of Interurban Avenue. With these sidewalk improvements, there is not adequate space for bicycle lanes.