3.3 Transportation

This section addresses transportation impacts associated with each alternative on the City's transportation system, which includes state highways, city streets, sidewalks, bikeways and trails, and public transportation facilities and services.

3.3.1 Affected Environment

Analysis Area

The transportation analysis area is shown in Figure 3.3-1. Vehicle traffic that is expected to result from the DSEIS alternatives was analyzed cumulatively with traffic from other planned regional growth. The City assesses its roadway system based on the operations of designated major intersections that are located throughout Kirkland; and thus, the effect of proposed development on all of the designated citywide intersections must be evaluated. For potential parking impacts, pedestrian, bicycle, and transit modes, the analysis area is the area within approximately 0.5 mile of the DSEIS alternative sites.

Existing Roadway Network

City Roadways

The City has established a system of roadway classifications based on intended mobility and access functions. The classification system allows the application of appropriate design and maintenance standards, and guides the programming of roadway improvements. The roadway classifications are principal arterial, minor arterial, collector, and local access roads.

Figure 3.3-2 shows the existing functional classifications of the city roadways. The classifications are described as follows.

- **Principal Arterial.** Principal arterials provide connections between city and other regional locations and facilitate movement within city limits. These roadways allow higher speed limits, carry the highest amount of traffic volumes, and provide the best mobility in the roadway network by limiting access and traffic control devices. Regional bus routes are typically located on principal arterials, as are transit centers and Park and Ride lots.
- **Minor Arterial.** Minor arterials connect with and augment principal arterials. Minor arterials give densely populated areas easy access to principal arterials and provide key circulation routes within a city. These roadways tend to have lower traffic flow levels than principal arterials because they provide more access to adjacent land uses (such as shopping centers, schools, etc.). Local and regional bus routes often run on minor arterials.
- **Collector.** Collectors allow easy movement within neighborhoods and channel neighborhood traffic onto the principal and minor arterial streets. Collectors generally carry moderate traffic volumes, move very little through traffic, and accommodate shorter trips than do either principal or minor arterials. Local bus routes typically run along collectors.

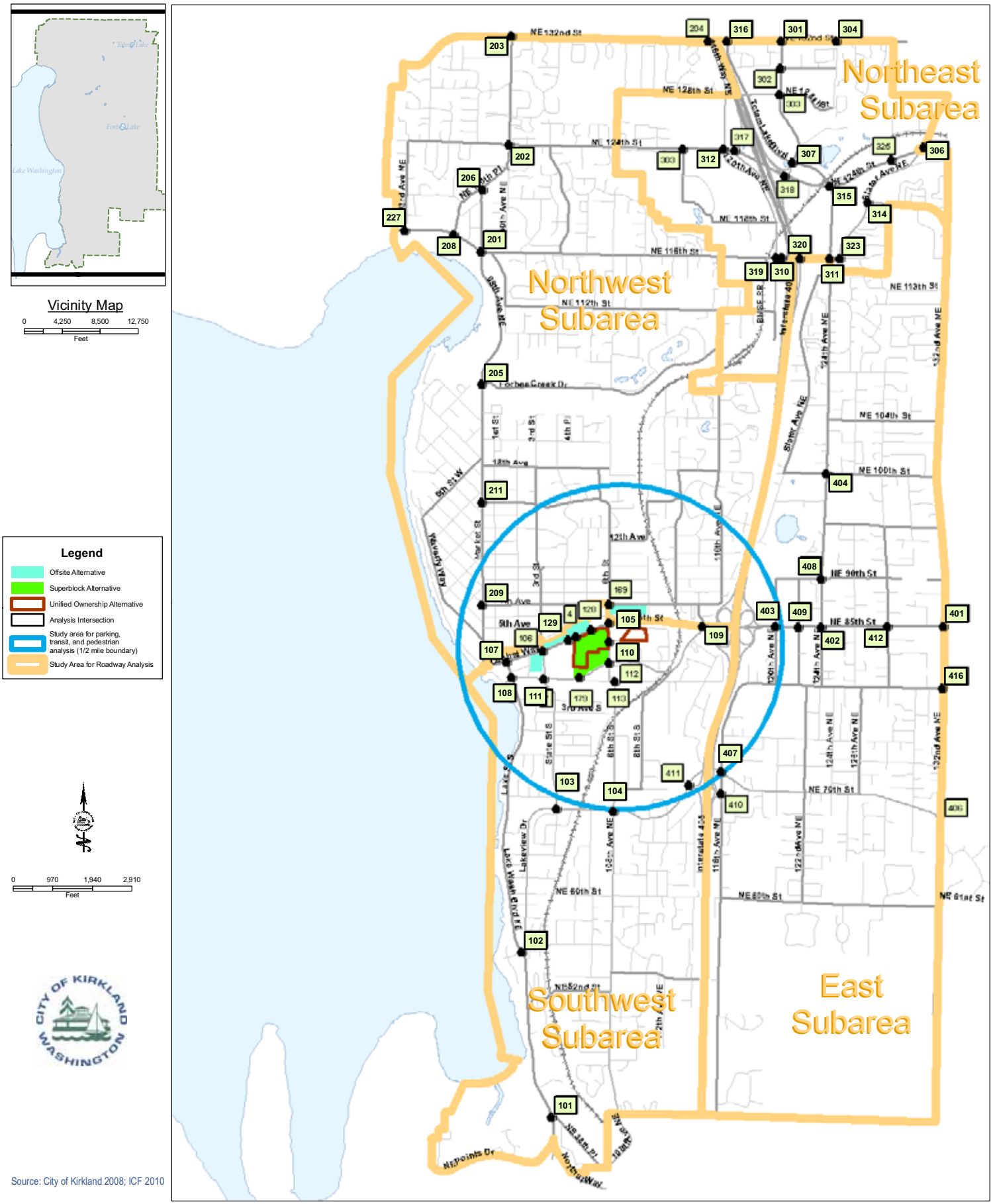


Figure 3.3-1
Transportation Analysis Area

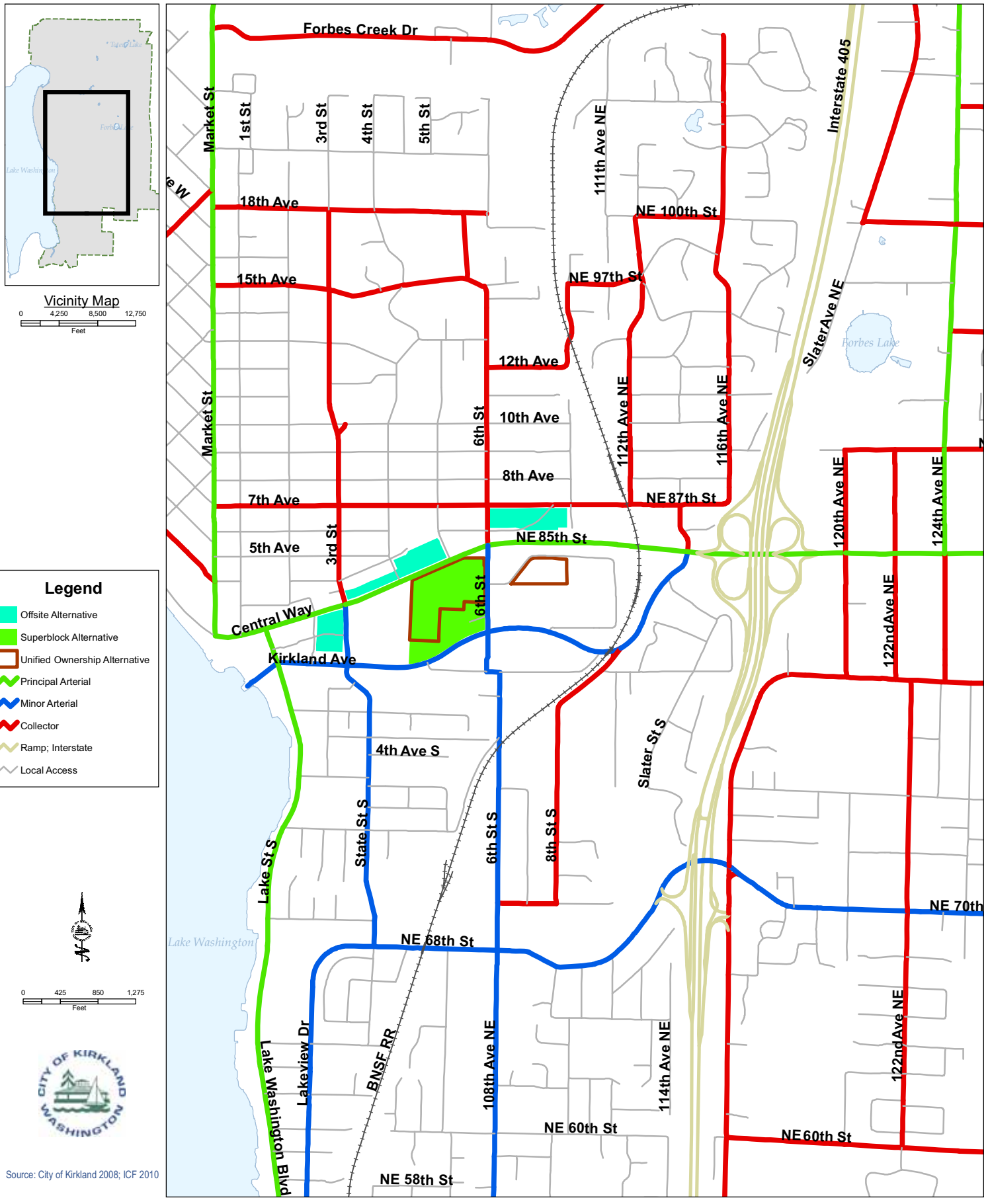


Figure 3.3-2
Roadway Functional Classifications

- **Local Access.** Local access streets comprise all remaining roadways and streets other than state and federal highways. The main function of local access streets is to provide direct access to abutting properties, while often limiting traffic movement. Local streets are generally associated with low vehicle speeds. Bus routes are less typically located along local access streets.

The City has more than 146 miles of roadway within its boundaries, of which approximately 26% is classified as principal arterial, minor arterial, or collector; and 74% is local access.

State Highways

The City is served by one state highway, Interstate (I)-405, which serves mobility needs in and beyond the City. I-405 runs roughly north–south through the middle of the City, dividing it into east and west sections. Northbound and southbound on- and off-ramps are provided at NE 124th Street, NE 85th Street, and 116th Avenue NE/NE 70th Street/NE 68th Street; and a northbound off-ramp and a southbound on-ramp are provided at NE 116th Street.

In 1998, the Washington State Legislature passed Highways of Statewide Significance (HSS) legislation, codified as RCW 47.06.140. HSS facilities provide and support transportation functions that promote and maintain significant statewide travel and economic linkages. The legislation emphasizes that these significant facilities should be planned from a statewide perspective and that local jurisdictions should assess the effects of local land use plans on HSS facilities. I-405 is designated as an HSS facility.

Any state highways that are not designated as HSS facilities are considered Highways of Regional Significance (HRS) and are subject to local standards. No HRS facilities are located in the City (Note, NE 85th Street, east of I-405, was previously designated as an HRS as SR 908, but this road is being turned over to the City by the State of Washington).

Roadway Access and Circulation

The City is bound on its west side by Lake Washington. The City of Redmond is located to the east, while the City of Bellevue is located to the south. The annexation area located to the north was voted in November 2009 to be part of Kirkland. However, the annexation and adopted zoning regulations will not become effective June 1, 2011. For the purposes of this DSEIS, the city limits effective prior to June 1, 2011 are the boundaries of the transportation analysis.

The following roadways provide primary east–west access in the City:

- NE 60th Street (east of I-405)
- NE 68th Street/NE 70th Street
- NE 80th Street (east of I-405)
- Central Way/NE 85th Street
- NE 124th Street
- Juanita Drive/NE 116th Street/Slater Avenue NE
- NE 132nd Street

The following roadways provide primary north-south access:

- Lake Washington Boulevard/Lake Street S/Market Street/98th Avenue NE/100th Avenue NE
- 108th Avenue NE/6th Street S
- 116th Avenue NE (City limits to NE 80th Street)
- 124th Avenue NE/Totem Lake Boulevard
- 132nd Avenue NE

Central Way/NE 85th Street provides direct east–west access to the planned action areas. North–south access is provided by Lake Washington Boulevard/Lake Street S/Market Street/98th Avenue NE/100th Avenue NE, located approximately six blocks to the west of the analysis area; or by I-405, located approximately six blocks to the east of the analysis area.

Existing Roadway Operations

Analysis of existing traffic conditions is based on evening (PM) peak-hour traffic counts that were collected at every study intersection. Traffic counts were taken at intersections throughout the City in May, September, and October 2007. Additional counts were taken in March 2010 in the vicinity of the SEIS alternative sites.

Traffic analysis was completed for this DSEIS to comply with the following City requirements:

- Traffic Impact Analysis (TIA) guidelines, which require that the effect of development proposals on roadway operations be directly analyzed; and
- Concurrency Management System, in which the City has defined thresholds by which the effectiveness of the transportation system to support planned land use is measured.

Each of these elements is described in the following sections.

Traffic Impact Analysis

The City has established TIA guidelines by which the effect of development proposals on roadway operations must be analyzed for the expected year of project completion. To comply with the City's TIA requirements for development requests, level of service (LOS) was analyzed at individual intersections according to procedures set forth in the Highway Capacity Manual (Transportation Research Board 2000). LOS is the primary measurement used to determine the operating quality of a road segment or intersection. The quality of traffic conditions is graded into one of six LOS designations: A, B, C, D, E, or F. LOS A and B represent the fewest traffic slow-downs, and LOS C and D represent intermediate traffic flow with some delay. LOS E indicates that traffic conditions are at or approaching congested conditions and LOS F indicates that traffic volumes are at a high level of congestion with unstable traffic flow.

Table 3.3-1 summarizes the LOS criteria for signalized and stop-controlled intersections.

Table 3.3-1. Level of Service Criteria for Intersections

	Average Delay per Vehicle (seconds/vehicle)	
LOS Designation	**Signalized Intersections**	**Stop-Controlled Intersections**
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

Source: Transportation Research Board 2000

At signalized intersections, LOS is determined by the average amount of delay experienced by all vehicles that travel through the intersection. For stop-controlled intersections, LOS is based on the average delay experienced by drivers on the stop-controlled approaches. Thus, for two-way or one-way stop-controlled intersections, LOS is based on the average delay experienced by vehicles entering the intersection on the minor (stop-controlled) approaches. For all-way stop-controlled intersections, LOS is determined by the average delay for all movements through the intersection. The LOS criteria for stop-controlled intersections have different threshold values than those for signalized intersections, primarily because drivers expect different levels of performance from different types of transportation facilities. In general, stop-controlled intersections are expected to carry lower volumes of traffic than signalized intersections. Thus, for the same LOS, a smaller amount of delay is acceptable at stop-controlled intersections than it is for signalized intersections.

The City's SEPA TIA guidelines require that LOS analysis be completed for the expected year of project completion, which for the SEIS alternatives is 2014. Based on the City's guidelines, intersections at which the 2014 project-generated trips contribute 1% or more of proportional share impact were selected for PM peak-hour analysis. To identify the analysis intersections:

- the number of 2014 PM peak hour vehicle trips generated by build-out of the alternatives was calculated (total trips are the same for each alternative);
- the City's travel demand model was used as a basis for projecting how the trips would distribute across the roadway network; and
- the number of entering project-generated trips was calculated at each potential analysis intersection.

Travel demand forecasting methods are discussed in more detail later in this section.

In addition to establishing the PM peak-hour thresholds described above, TIA guidelines give the City Public Works Department the authority to select additional locations for analysis. Table 3.3-2 presents the intersections that were chosen for analysis, based on these guidelines, and shows existing LOS at the analysis locations. A total of 51 intersections were identified for PM peak hour LOS analysis. Previous analyses completed for the Downtown Area Planned Action Ordinance Final Environmental Impact Statement (ICF Jones & Stokes 2008) did not identify any mitigation triggered only by AM peak-hour conditions (e.g. any location with congested conditions during the AM peak hour also had congestion during the PM peak hour). Since the overall number of project generated

trips is similar to that previous analysis, it was determined that additional AM peak hour analysis was not warranted for this study.

Table 3.3-2. TIA Intersections – Existing PM Peak Hour Level of Service

ID	Intersection	Traffic Control[1]	LOS[2]	Average Delay (sec/veh)[2]
	Southwest Subarea			
4	Central Way/Parkplace Driveway	Two Way Stop	F	257.2
7	Kirkland Way/Parkplace Driveway	Two Way Stop	C	20.2
101	Lake Washington Boulevard/NE 38th Place	Signal	D	45.3
102	Lake Washington Boulevard/Lakeview Drive	Signal	B	19.8
103	State Street/NE 68th Street	Signal	C	24.9
104	108th Avenue NE/NE 68th Street	Signal	E	58.6
105	Central Way/6th Street	Signal	C	30.9
106	Central Way/3rd Street	Signal	C	28.1
107	Central Way/Lake Street	Signal	C	34.9
108	Lake Street/Kirkland Avenue	Signal	B	19.0
109	NE 85th Street/114th Avenue NE	Signal	F	87.7
110	6th Street/4th Avenue	Signal	B	12.7
111	Kirkland Avenue/3rd Street	All Way Stop	C	21.8
112	Kirkland Way/6th Street	All Way Stop	F	78.8
113	Kirkland Avenue/6th Street	Two Way Stop	C	22.3
128	Central Way/5th Street	Two Way Stop	E	48.2
129	Central Way/4th Street	Two Way Stop	E	48.3
169	6th Street/7th Avenue	All Way Stop	B	13.7
179	Kirkland Way/Kirkland Avenue	Two Way Stop	C	17.0
	Northwest Subarea			
201	98th Avenue NE/Juanita Drive	Signal	D	49.3
202	100th Avenue NE/NE 124th Street	Signal	D	53.9
203	100th Avenue NE/NE 132nd Street	Signal	D	56.8
205	Market Street/Forbes Creek	Signal	B	14.8
206	98th Avenue NE/NE 120th Place	Signal	B	11.1
208	Juanita Drive/97th Avenue NE	Signal	B	18.2
209	Market Street/7th Avenue	Two Way Stop	F	116.5
211	Market Street/15th Avenue	Two Way Stop	C	23.0
227	Juanita Drive/93rd Avenue NE	Two Way Stop	F	75.6
	Northeast Subarea			
301	120th Avenue NE/NE 132nd Street	Signal	B	13.4
303	120th Avenue NE/NE 128th Street	Signal	B	11.6
304	NE 132nd Street/124th Avenue NE	Signal	F	166.2
306	NE 124th Street/Slater Avenue NE	Signal	F	83.9
307	Totem Lake Blvd/120th Avenue NE	Signal	E	57.2

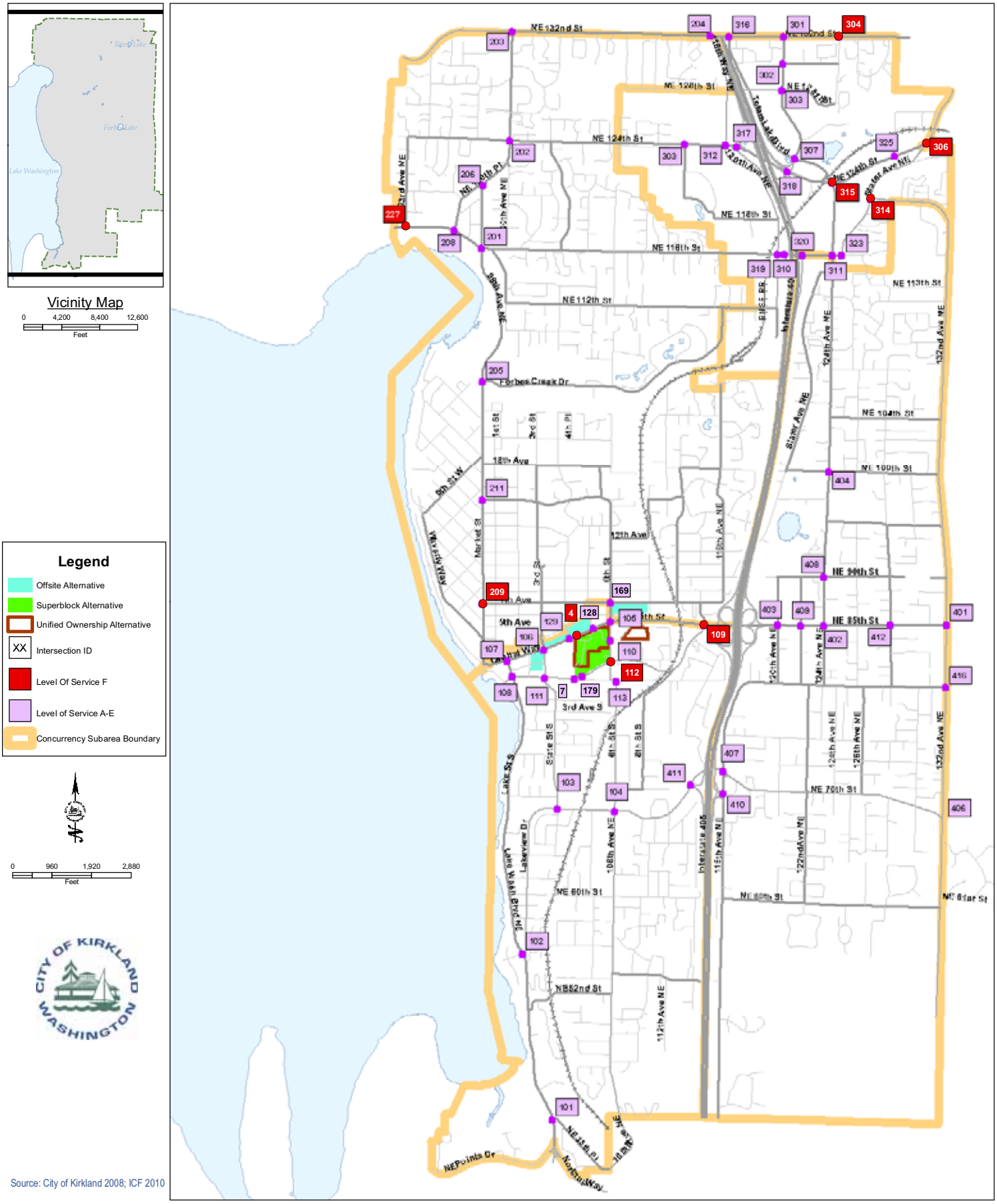
ID	Intersection	Traffic Control[1]	LOS[2]	Average Delay (sec/veh)[2]
310	NE 116th Street/120th Avenue NE	Signal	D	37.7
311	NE 116th Street/124th Avenue NE	Signal	D	33.6
312	NE 124th Street/116th Avenue NE	Signal	D	43.1
314	Slater Avenue NE/NE 120th Street	Signal	F	86.7
315	NE 124th Street/Totem Lake Blvd	Signal	F	122.2
316	Totem Lake Blvd/NE 132nd Street	Signal	D	38.7
319	I-405 / SB On NE 116th Street	Two Way Stop	B	12.9
320	I-405 / NB Off NE 116th Street	Signal	E	72.8
323	Slater Avenue NE/NE 116th Street	Two Way Stop	E	35.4
	East Subarea			
401	NE 85th Street/132nd Avenue NE	Signal	D	45.7
402	NE 85th Street/124th Avenue NE	Signal	E	67.0
403	NE 85th Street/120th Avenue NE	Signal	C	25.6
404	124th Avenue NE/NE 100th Street	Signal	A	8.0
407	NE 70th Street/116th Avenue NE	Signal	C	33.6
408	NE 90th Street/124th Avenue NE	Signal	C	23.7
409	NE 85th Street/122nd Avenue NE	Signal	B	15.6
412	NE 85th Street/128th Avenue NE	Signal	A	7.5
416	NE 80th Street/132nd Avenue NE	All Way Stop	E	47.2

[1]. LOS/Delay shown for worst movement at Two Way Stop controlled intersections.
[2]. Rows that are shaded indicate intersections where existing deficiencies have been identified.
Source: Heffron Transportation, Inc. 2008

The table shows that the following nine intersections are currently operating at LOS F under existing conditions:

- Central Way/Parkplace Driveway
- NE 85th Street/114th Avenue NE
- Kirkland Way/6th Street
- Market Street/7th Avenue
- Juanita Drive/93rd Avenue NE
- NE 132nd Street/124th Avenue NE
- NE 124th Street/Slater Avenue NE
- Slater Avenue NE/NE 120th Street
- NE 124th Street/Totem Lake Boulevard

These intersections that are operating under LOS F are also shown in Figure 3.3-3.



Source: City of Kirkland 2008; ICF 2010

Figure 3.3-3
Existing Traffic Conditions

Under the GMA, new development cannot be required to fix existing deficiencies. However, traffic generated by new development can exacerbate existing problems, and applicants can be required to contribute to needed improvements according to the development's proportionate share of generated traffic.

Concurrency Management System

Transportation planning at the state, county and local levels is guided by the GMA, which mandates that agencies adopt concurrency management systems to ensure that new development cannot occur unless adequate transportation infrastructure already exists to support it, or is built concurrent with development (within 6 years of the time that the need for the project is triggered). In addition to construction of new capital facilities, improvements to meet concurrency may include transit service or transportation demand management (TDM) strategies. Concurrency applies to Comprehensive Plan-level land use changes, as well as specific development proposals. Under the GMA, financing sources must be identified for concurrency projects. Thus, for approved land use and development proposals, the infrastructure projects needed to support them are included in the transportation element of in the City's Capital Improvement Plan (CIP).

The Concurrency Management System is adopted as a policy in the City of Kirkland Comprehensive Plan and in the Kirkland Municipal Code. Under the Concurrency Management System, the City measures level of service according to calculated volume-to-capacity ratios (V/Cs) of designated signalized intersections. Level of service as defined for concurrency management is different than LOS defined under the City's TIA guidelines. For concurrency, level of service is measured by V/C of signalized intersections and is calculated using the planning methods established in Transportation Research Circular 212 (Transportation Research Board 1980).

The capacity (C) of a signalized intersection is a measure of the maximum number of vehicles that can travel through the intersection in a set period of time. It is calculated based on multiple factors, including signal phasing, number of lanes, and the types of vehicles that make up the traffic. The volume (V) is the sum of "critical" volumes that indicate maximum demand at the intersection. The V/C is the volume divided by the capacity. V/C is calculated for the PM peak hour of a typical weekday, which is the most congested hour of the day.

A V/C of less than 1 indicates that the traffic volume that moves through the intersection is lower than the capacity of the intersection. If the V/C is equal to 1, the intersection's volume and capacity are approximately equal. V/C that is greater than 1 indicates that the volume has exceeded capacity. Increasing V/C indicates that congestion is increasing and that level of service is becoming worse at the intersection.

Concurrency analysis considers the effects of proposed land use plans or projects on the transportation system at the time of completion, and for the long-range planning horizon. Concurrency planning for the year of completion, which is 2014 for the SEIS alternatives, is a legal requirement to ensure that the City has funding secured in its 6-year CIP for transportation projects needed to support development planned through that time period.

Concurrency analysis is additionally applied for the long-range planning horizon of 2022, because the SEIS alternatives would result in a change in the Comprehensive Plan. The long-range concurrency analysis ensures that the transportation plan will support proposed development through the planning year defined in the Comprehensive Plan.

City transportation policy establishes a two-tiered concurrency standard. Traffic conditions meet concurrency standards when both of the following conditions are met for a typical weekday PM peak hour:

- no individual signalized system intersection may have a V/C greater than 1.40; and
- maximum allowed subarea average V/C for signalized system intersections in each subarea may not exceed the values listed in Table 3.3-3.

Table 3.3-3. Concurrency Thresholds

	Subarea Average V/C		
Subarea	**Existing (2008)**	**2014**	**2022**
Southwest	0.90	0.90	0.92
Northwest	0.90	0.91	1.01
Northeast	0.88	0.89	0.99
East	1.05	1.05	1.10
Maximum allowed individual system intersection V/C	**1.40**	**1.40**	**1.40**

Source: City of Kirkland 2004a

The program requires both standards to be satisfied as new development occurs. Underlying the concurrency definition is the concept that the system is not automatically considered to fail concurrency if the peak hour is congested at an individual location. Use of the PM peak hour for measuring LOS is typical throughout the region. This "worst case" measure implies that traffic will flow better during the rest of the day. Under some circumstances, a V/C greater than 1 for the peak hour is considered acceptable under City standards because financial and physical constraints place limitations on the amount of roadway improvement that is feasible within the City.

The signalized intersections included in the Concurrency Management System are established as City policy in the adopted Comprehensive Plan (City of Kirkland 2004), and shown in Figure 3.3-1.

Table 3.3-4 lists the intersections included in the Concurrency Management System, as well as their individual and subarea V/Cs under existing conditions. The table shows that all individual intersections and subareas are currently operating at V/Cs under the established thresholds.

Table 3.3-4. Concurrency Assessment—Existing Conditions (2008)

ID	Intersection	V/C	Threshold
	Southwest Subarea		
101	Lake Washington Boulevard/NE 38th Place	1.02	1.40
102	Lake Washington Boulevard/Lakeview Drive	0.71	1.40
103	State Street/NE 68th Street	0.61	1.40
104	108th Avenue NE/NE 68th Street	0.97	1.40
105	6th Street/Central Way	0.69	1.40
106	3rd Street/Central Way	0.71	1.40
107	Lake Street/Central Way	0.71	1.40
108	Lake Street/Kirkland Avenue	0.50	1.40
109	114th Ave NE/NE 85th Street	0.97	1.40
	Southwest Subarea Average	0.76	0.90
	Northwest Subarea		
201	98th Avenue NE/Juanita Drive	0.81	1.40
202	100th Avenue NE/NE 124th Street	0.93	1.40
203	100th Avenue NE/NE 132nd Street	0.86	1.40
204	116th Way NE/NE 132nd Street	0.90	1.40
205	Market Street/Forbes Creek Drive	0.58	1.40
	Northwest Subarea Average	0.82	0.90
	Northeast Subarea		
301	120th Avenue NE/NE 132nd Street	0.58	1.40
302	120th Avenue NE/NE 130th Street	0.35	1.40
303	120th Avenue NE/NE 128th Street	0.40	1.40
304	124th Avenue NE/NE 132nd Street	0.84	1.40
306	Slater Avenue NE/NE 124th Street	1.00	1.40
307	120th Avenue NE/Totem Lake Boulevard	0.80	1.40
310	120th Avenue NE/NE 116th Street	0.60	1.40
311	124th Avenue NE/NE 116th Street	0.91	1.40
312	116th Avenue NE/NE 124th Street	0.88	1.40
313	113th Place NE/NE 124th Street	0.63	1.40
314	Slater Avenue NE/NE 120th Street	0.78	1.40
315	Totem Lake Boulevard/NE 124th Street	0.94	1.40
316	Totem Lake Boulevard/NE 132nd Street	0.96	1.40
317	I-405 SB Off Ramp/NE 124th Street	0.68	1.40
318	I-405 NB Off Ramp/NE 124th Street	0.52	1.40
320	I-405 NB Off Ramp/NE 116th Street	0.78	1.40
325	128th Lane NE/NE 124th Street	0.69	1.40
	Northeast Subarea Average	0.73	0.88

ID	Intersection	V/C	Threshold
	East Subarea		
401	132nd Avenue NE/NE 85th Street	0.81	1.40
402	124th Avenue NE/NE 85th Street	0.88	1.40
403	120th Avenue NE/NE 85th Street	0.83	1.40
404	124th Avenue NE/NE 100th Street	0.74	1.40
406	132nd Avenue NE/NE 70th Street	0.77	1.40
407	116th Avenue NE/NE 70th Street	0.91	1.40
408	124th Avenue NE/NE 90th Street	0.78	1.40
409	122nd Avenue NE/NE 85th Street	0.78	1.40
410	116th Avenue NE/I-405 NB Ramps	0.92	1.40
411	I-405 SB Ramps/NE 72nd Place	0.31	1.40
	East Subarea Average	0.77	1.05

Source: Mirai & Associates 2008

Parking

Table 3.3-5 summarizes the public parking facilities that currently exist in Downtown. In addition to public parking, many commercial establishments provide parking for customers on private lots located at their sites. Some of these lots also offer paid parking for the general public in the evening.

Table 3.3-5. Public Parking in Downtown

Parking Type	Location
Free 2-Hour Parking	On street parking in the Downtown core Lakeshore Plaza Lot Lake Street Lot
Free 4-Hour Parking	The upper lot of the Municipal Parking Garage located under the Kirkland Public Library at the intersection of 3rd Street and Kirkland Avenue (enforced until 7:30 p.m.)
Paid Parking	Spaces in the Municipal Parking Garage are provided for all-day parking (9:00 a.m. to 7:30 p.m.) A limited number of metered parking spaces in the Lake Street Lot and Lakeshore Plaza Lot for $1 per hour (4-hour limits)

Source: City of Kirkland 2004b

The City surveys parking occupancy for public parking facilities several times per year. Survey data indicate that the highest parking demand occurs in August, and the next highest occurs in November. For the permitted parking at the Municipal Parking Garage, the time of peak demand is 1:00 p.m. to 3:00 p.m. For the free parking provided on-street, in the Municipal Garage, and at the two lots, the highest demand occurs between 6:00 p.m. and 9:00 p.m., and the next highest demand occurs during noon and 2:00 p.m. Data collected in 2007 indicates the following:

- Average occupancy at the Lake Street lot ranges between 65% and 80% during off-peak times of the day. The lot is 85% to 100% full during the peak periods of the day.
- Average occupancy at the Lakeshore Plaza lot ranges between 40% and 100%. During peak months, occupancy is 90% to 100% during much of the day.

- Average occupancy of the free parking spaces at the Municipal Garage ranges between 45% and 80%. During peak periods, the average occupancy is around 80%.
- Average occupancy of on-street parking ranges between 40% and 70% during off-peak periods. Peak demand ranges between 50% and 95%, with average occupancy exceeding 90% during the peak periods in the peak months of the year.

Comparison of 2006 and 2007 survey data indicates a general increase in parking demand between the 2 years. The data indicate that under existing conditions, parking supply is adequate to meet demand during most times of the day, and during most times of the year. However, the 85% to 100% occupancy rates during peak periods in August and November indicate that there is very little excess public parking supply during the times of highest demand.

Collision History

Table 3-3.6 presents a summary of intersection collisions that occurred in the downtown area from 2004 through 2006. The average number of collisions recorded at each location is normalized by calculating the rate per million entering vehicles. This takes into account the fact that higher traffic volumes mean higher levels of potential conflicts, and thus the higher the potential that collisions will occur. The table shows that the highest number of collisions, as well as the highest rate, occurred at the intersection of Central Way and 6th Street.

The average collision rate for intersections citywide is 0.57 collisions per million entering vehicles. The table shows that rates at the intersections in the vicinity of the planned action areas are higher than the citywide average. The calculated rates at the intersections of Central Way/6th Street and Central Way/4th Street are approaching 1.0 collision per million entering vehicles. Any capacity improvements proposed at these locations could also result in improvement to safety conditions.

Table 3.3-6. Intersection Collisions in the Downtown Area: 2004-2006

Intersection	Intersection ADT	Total 3-Year Collisions	Average Collisions per Year	Collision Rate per Million Entering Vehicles
Central Way and 3rd Street[1]	24,870	18	6.0	0.64
Central Way and 4th Street[2]	17,050	17	5.7	0.91
Central Way and 5th Street[2]	19,840	15	5.0	0.69
Central Way and 6th Street[1]	33,420	36	12.0	0.98
Kirkland Way and 3rd Street[2]	13,280	11	3.7	0.76
Kirkland Way and 6th Street[2]	13,950	11	3.7	0.72
Citywide average[3]				**0.57**

1. Collision Rates at Central Way/3rd Street and Central Way/6th Street are the average 3-year rates (2004-2006) calculated by the City. Intersection ADT at Central Way/3rd Street and Central Way/6th Street are 2006 ADT obtained from the City
2. A factor of 0.1 was applied to the existing PM peak hour volumes to calculate intersection ADT
3. Average rate of 46 intersections located throughout the City.

Transit

This section describes the transit facilities and service in the City. Figure 3.3-4 illustrates the bus service and transit facilities provided in the vicinity of the alternative sites.

Kirkland Transit Center

The Kirkland Transit Center is located at 3rd Street and Park Lane, and directly serves the analysis area. The Transit Center serves as a central stop for the bus routes that serve the area. This location is not a Park and Ride and does not have parking spaces available, although bicycle lockers are provided.

Park and Ride Facilities

The following major Park and Ride facilities are located in the City.

- **Houghton Park and Ride.** I-405 and 70th Place with 470 parking spaces plus bicycle lockers.
- **Kingsgate Park and Ride.** I-405 and NE 132nd Street with 502 parking spaces plus bicycle lockers.
- **South Kirkland Park and Ride.** 106th Avenue NE and NE 38th Place with 596 parking spaces plus bicycle lockers and bicycle racks.

King County Metro (Metro) also contracts with owners of other small lots located throughout the City to serve as Park and Ride lots during weekdays.

Transit Service

Metro and Sound Transit provide the following transit services in the City:

- Fixed bus routes
- Rideshare services
- Paratransit
- Dial-A-Ride Transit

These services are described in the following sections.

Fixed Bus Routes

Fixed bus routes may be classified as local routes that provide all-day service (often including weekends) or as commuter routes operating only during peak travel periods. Most routes serve the city as an intermediate point between a starting and ending destination. Some routes operate along city roadways while others serve only park and ride lots. The local routes typically provide two-way service between destinations in the City and surrounding areas, from morning through evening. Commuter bus service provides service to major employment destinations in King County, typically operating only during the weekday morning and evening peak commute periods. Every Metro and Sound Transit bus is equipped to accommodate wheelchairs. All buses are also equipped with bicycle racks.

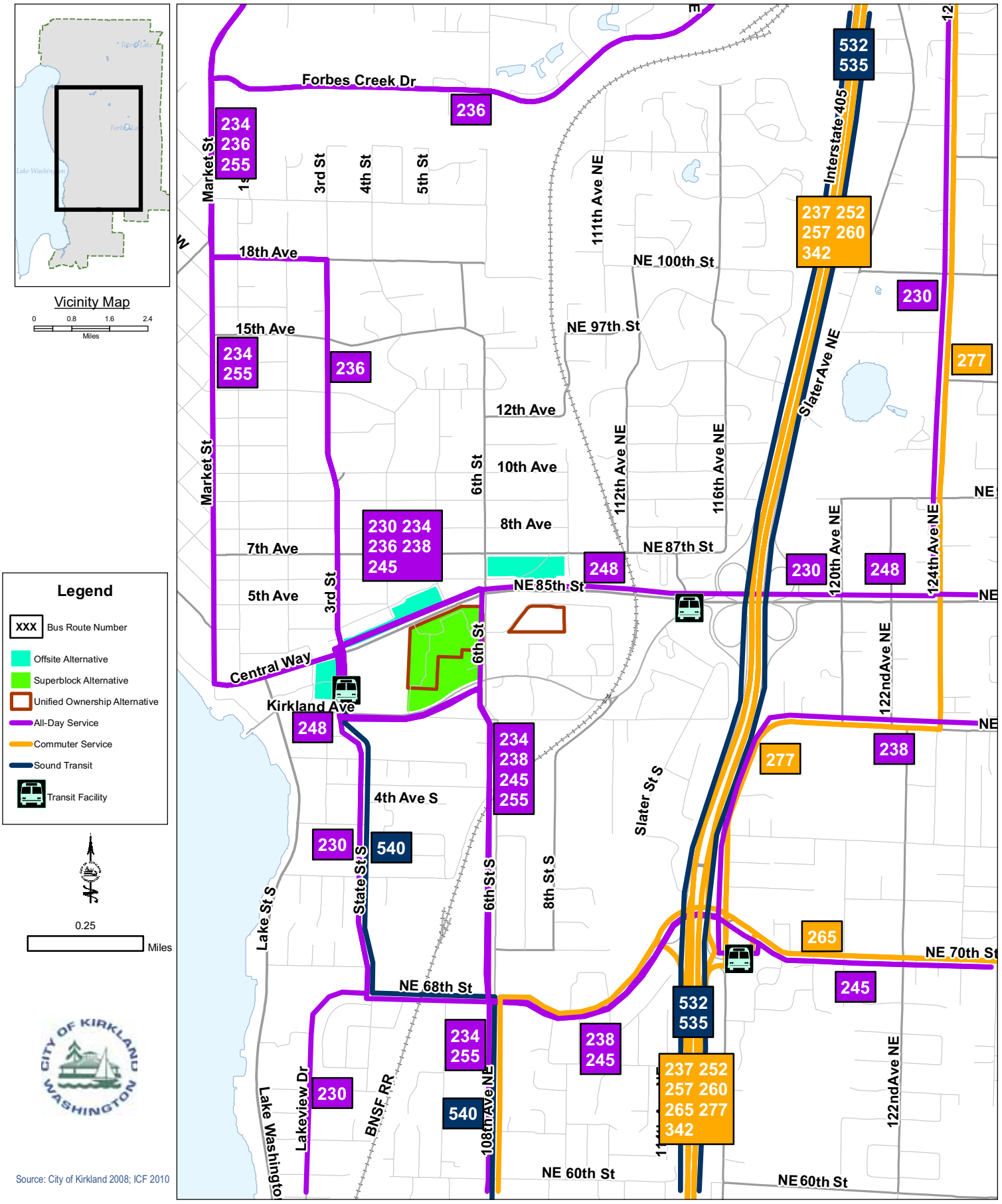


Figure 3.3-4
Transit Service

Local bus routes generally operate 5 to 7 days a week from early morning through evening hours. Table 3.3-7 summarizes the local bus routes that serve the City.

Table 3.3-7. Local Bus Service

Route	Service	Major Destinations	Directly Serves the Analysis Area
Metro 230	Daily	Kingsgate Park & Ride – Bellevue – Redmond.	Yes
Metro 234	Daily	Kenmore – Bellevue	Yes
Metro 236	Daily	Woodinville – Kirkland Transit Center	Yes
Metro 238	Daily	Bothell – Kirkland Transit Center	Yes
Metro 245	Daily	Bellevue – Kirkland	Yes
Metro 248	Daily	Kirkland – Redmond – Avondale	Yes
Metro 255	Daily	Downtown Seattle – Kirkland	Yes
Metro 935	Weekdays only	Kenmore – Kingsgate Park and Ride	No

Commuter routes generally operate on weekdays in the peak travel direction during peak hours. Table 3.3-8 summarizes the commuter bus routes that serve the City. The commuter routes are primarily accessed at major intersections and Park and Ride lots. They can be accessed via the local transit service summarized in Table 3.3-7.

Sound Transit Express Bus Service

Sound Transit, which provides regional service to the urban portions of Snohomish, King, and Pierce counties, operates several routes in the City. Route 540 directly serves the analysis area, providing daily service between Seattle's University District and the Kirkland Transit Center. Two other Sound Transit routes serve north Kirkland, with one stop at I-405 and NE 128th Street/Totem Lake Boulevard: Route 532 provides weekday service between Everett, Bothell, and Bellevue, and Route 535 provides daily service between Everett, Lynnwood, and Bellevue.

Rideshare Services

Metro provides the following rideshare services:

- **Commuter Vanpools.** Metro Transit maintains the oldest and largest public vanpool program in the United States. Metro provides vehicles, driver orientation, vehicle maintenance, and assistance in forming vanpool groups.
- **Carpools.** Metro provides ride-matching services for people seeking carpool partners. People interested in finding carpool partners can call Metro for information.

Paratransit Services

Metro offers Access Transportation service using shared van transportation throughout most of King County for those eligible for the ADA Paratransit Program. Reservations must be made 1 to3 days in advance.

Dial-A-Ride Transit

Dial-A-Ride Transit (DART) is a specialized bus service provided by Metro using vans that can deviate from regular fixed bus routes within a designated service area. It is available to the general

public and reservations must be made in advance. DART service is operated by Hopelink, a non-profit organization under contract to Metro.

Table 3.3-8. Commuter Bus Service

Route	Service	Major Destinations to/from Kirkland (in peak direction)
Metro 237	Weekday peak hours	AM –Woodinville to Kirkland to Bellevue PM –Bellevue to Kirkland to Woodinville
Metro 244	Weekday peak hours	AM – Kenmore to Kirkland to Bellevue PM – Bellevue to Kirkland to Kenmore
Metro 252	Weekday peak hours	AM –Kingsgate to Kirkland to Downtown Seattle PM –Downtown Seattle to Kirkland to Kingsgate
Metro 256	Weekday peak hours	AM –Downtown Seattle to Kirkland to Bellevue PM –Bellevue to Kirkland to Downtown Seattle
Metro 257	Weekday peak hours	AM –Kingsgate to Kirkland to Downtown Seattle PM –Downtown Seattle to Kirkland to Kingsgate
Metro 260	Weekday peak hours	AM –Finn Hill to Kirkland to Downtown Seattle PM –Downtown Seattle to Kirkland to Finn Hill
Metro 265	Weekday peak hours	AM –Redmond to Kirkland to Downtown Seattle PM –Downtown Seattle to Kirkland to Redmond
Metro 277	Weekday peak hours	AM –Kirkland to University District PM –University District to Kirkland
Metro 291	Weekday peak hours	AM –Redmond to Kirkland/Kirkland to Redmond PM –Redmond to Kirkland/Kirkland to Redmond
Metro 342	Weekday peak hours	AM –Shoreline to Lake Forest Park to Kenmore to Bothell to Kirkland to Bellevue to Newcastle to Renton PM –Renton to Lake Forest Park to Kenmore to Bothell to Kirkland to Bellevue to Newcastle to Renton
Metro 952	Weekday peak hours	AM –Auburn to Kent to Renton to Bellevue to Kirkland to Everett (Boeing) PM –Everett (Boeing) to Kirkland to Bellevue to Renton to Kent to Auburn (custom bus that operates to and from Boeing)
Metro 981	Weekday peak hour	PM – Bellevue to Kirkland (custom bus)
Metro 986	Weekday peak hours	AM –Kirkland to Seattle PM –Seattle to Kirkland (custom bus that operates to and from three private schools in Seattle)

Source: King County Metro

Pedestrian Facilities

Pedestrian facilities in the City include sidewalks, paved trails, multipurpose unpaved trails, limited purpose unpaved trails, roadway shoulders, and the shared use of low traffic streets. The City's street network provides a moderately developed sidewalk system. A citywide inventory of sidewalks and trails was completed in 2000. According to the inventory, there were 82.8 miles of sidewalks and 19.3 miles of trails in the City. More than 50% of City streets have sidewalks.

Figure 3.3-5 shows sidewalks and pathways located within approximately one mile of the analysis area. In the immediate vicinity of the analysis area, pedestrian facilities are present on several streets, including Central Way, 6th Street, and Kirkland Way. However, only roadway shoulders exist on a portion of Kirkland Way between 2nd Avenue and Ohde Avenue. Sidewalks are discontinuous on 7th Avenue. The City is 57% complete with sidewalk installation within a half-mile radius of the project.

Sidewalks are required on both sides of all new streets and as part of all major street improvement projects. City policies support improved connectivity between destinations, including transit stops, as an important principle in maintaining or enhancing a pedestrian network.

Bicycle Facilities

Bicycle facilities in the City total approximately 41 miles and include shared use paths, bike lanes, and shared roadways. The former vehicle bridge in Juanita Bay Park is the only shared use path facility (route for the exclusive use of non-motorized transportation) in Kirkland. There are approximately 24.2 miles of bike lane facilities, which are striped lanes alongside vehicle lanes on a street. The remaining 16.8 miles are composed of 16.4 miles of shared roadway facilities, which are designated bicycle routes without signs or striping on residential streets, and 0.4 mile of non-motorized paths for bicycles, pedestrians and other users.

Alternative Mode Shares

Vehicles, and single-occupant vehicles (SOV) in particular, are the predominate mode of travel in Kirkland. Census data indicate that SOVs carry 86% of work trips in the City. Of the 14% of work trips involving modes other than SOV, transit carries 6.6% and the remainder of trips are taken via carpools or vanpools (U.S. Census Bureau 2000). This existing pattern of travel reflects a dependence on individual vehicles for most mobility needs.

In the State of Washington, alternative transportation solutions are further necessitated by the objectives of the Commute Trip Reduction (CTR) Law. Passed in 1991 as a section of the Washington Clean Air Act (RCW 70.94), the CTR Law seeks to reduce workplace commute trips in the nine most populous counties in the state, including King County. This law requires that cities in designated high-population counties adopt a commute trip reduction plan requiring private and public employers with 100 or more employees implement TDM programs. Programs provide various incentives or disincentives to encourage use of alternative transportation modes, other than the SOV.

Among CTR sites citywide, 2005 survey data indicated that 82% of commuters traveled by SOV. A former CTR employer located in Parkplace achieved a 76% SOV rate with an aggressive TDM program. Of the remaining work trips that occurred via alternative modes, the majority were taken via carpool.

TDM consists of strategies that seek to maximize the efficiency of the transportation system by reducing demand on the system. The results of successful TDM can include:

- Travelers switch from SOV to high occupancy modes such as transit, vanpools or carpools.
- Travelers switch from driving to non-motorized modes such as bicycling or walking.
- Travelers change the time they make trips from more congested to less congested times of day.

- Travelers eliminate trips altogether through such means as compressed workweeks, consolidation of errands, or use of telecommunications.

TDM strategies may include: (1) working cooperatively with employers to implement programs that encourage employees not to drive alone; (2) requiring certain new developments to implement programs to reduce SOV use; (3) adjusting parking standards to meet existing demand and reducing them further when transportation options increase; and (4) supporting paid parking or other parking policy measures.

The City's mode split target for 2022 is 65% SOV and 35% transit/other modes. This represents a long-term goal for the City to achieve through providing improved transit accessibility, TDM, efficient non-motorized systems, locating shops and services close to home, and implementing other strategies to encourage citizens to travel by modes other than SOV. The higher the success of TDM strategies, the more successful the City will be at achieving this mode split goal.

3.3.2 Impacts

Roadway Operations

Methodology

For the transportation impact analysis presented in this section, future traffic conditions were projected for the following scenarios:

- **2022 No Action Alternative.** This scenario assumes future development throughout the City that is consistent with future land use defined in the City of Kirkland Comprehensive Plan. This reflects expected growth in population and employment that are consistent with the City's targets. Regional growth in population and employment outside of Kirkland, as projected by the PSRC, are also reflected in the No Action Alternative.
- **2022 Superblock Alternative.** This scenario assumes that land use outside of the Superblock site will be the same as 2022 No Action Alternative. Within the site, build-out of the land use defined for the Superblock Alternative is assumed.
- **2022 Off-Site Alternative.** This scenario assumes that land use outside the three Off-Site Alternative sites will be the same as 2022 No Action Alternative. Within the three sites, build-out of the land use defined for the Off-Site Alternative is assumed.
- **2022 Unified Ownership Alternative.** This scenario assumes that land use outside the two Unified Ownership Alternative sites will be the same as 2022 No Action Alternative. Within the two sites, build-out of the land use defined for the Unified Ownership Alternative is assumed.
- **2014 No Action Alternative.** This scenario assumes straight line growth in housing and jobs will occur between 2008 and 2022 in the City and in the region. The level of assumed development for 2014 was interpolated, based on that linear growth.
- **2014 Superblock Alternative.** Within the site, build-out of the land use defined for the Superblock Alternative is assumed. This scenario assumes that land use outside of the Superblock site will be the same as 2014 No Action Alternative.

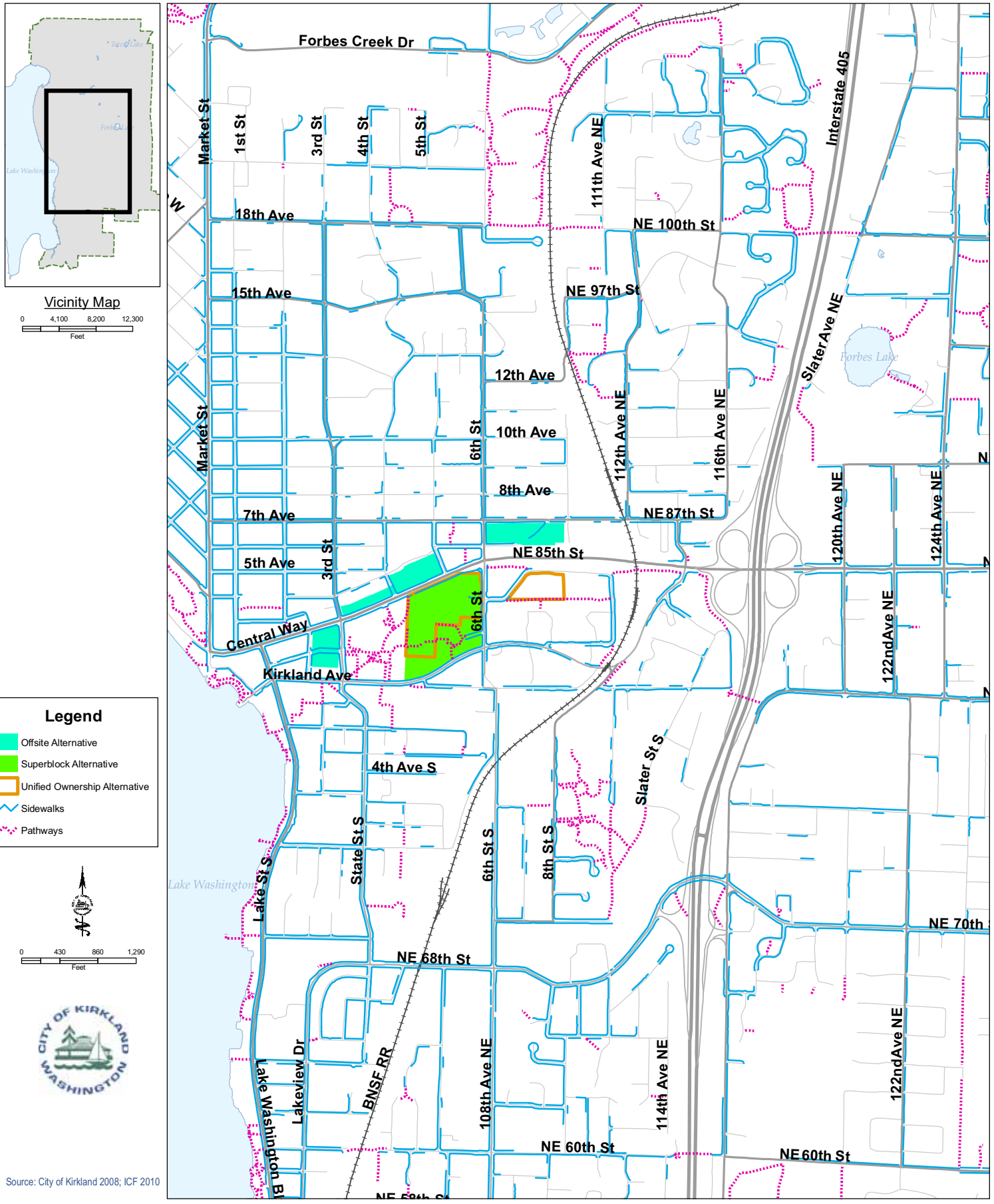


Figure 3.3-5
Sidewalks and Pathways

- **2014 Off-Site Alternative.** Within the three sites, build-out of the land use defined for the Off-Site Alternative is assumed. This scenario assumes that land use outside the three Off-Site Alternative sites will be the same as 2014 No Action Alternative.
- **2014 Unified Ownership Alternative.** Within the two sites, build-out of the land use defined for the Unified Ownership Alternative is assumed. This scenario assumes that land use outside the two Unified Ownership Alternative sites will be the same as 2014 No Action Alternative.

Travel Demand Model for No Action Alternative

The 2014 and 2022 No Action Alternative scenarios were previously modeled for the 2008 FEIS. This DSEIS analysis utilizes the same No Action Alternative analysis, described in this section.

Analysis for this No Action Alternative used the Bellevue-Kirkland-Redmond (BKR) travel demand forecasting model, which is a traffic analysis tool used for forecasting future traffic volumes based on existing traffic patterns and forecasted land use growth. It provides future traffic volumes for development review and comprehensive planning. The model forecasts the traffic distribution of proposed future development for traffic impact analysis related to development review. The BKR model integrates elements of the regional model developed by the Puget Sound Regional Council (PSRC).

The model is used to project future travel demand for the Puget Sound region with primary focus on the metropolitan area east of Lake Washington. The base-year modeling platform is updated annually to reflect changes in land use and roadway network, and validated annually according to new observed data such as traffic counts and household travel surveys.

The general process for the BKR model employs the traditional travel demand forecast modeling process, which includes the following key components:

- **Transportation Network and Zone Development.** The roadway network is represented as a series of links (roadway segments) and nodes (intersections). Characteristics such as capacity, length, speed, and turning restrictions at intersections are coded into the network. The regional model area is divided into Transportation Analysis Zones (TAZs) that have similar land use characteristics.
- **Existing Land Use Assessment.** The BKR model includes each jurisdiction's land use in the analysis area; and land use information is carefully managed and routinely updated to support transportation planning activities. Land use is based on regional population and employment inventory provided by the PSRC and the local jurisdictions. The land use is quantified within each TAZ.
- **Trip Generation.** The trip generation step estimates the total number of trips produced by and attracted to each TAZ in the model area, based on the land use within the TAZ. The trips are estimated using statistical data on population and household characteristics, employment, economic output, and land uses. The trip generation model estimates the number of trips generated per household in residential areas, and per employee in non-residential areas. The output is expressed as the total number of trips produced in each TAZ and the total number of trips attracted to each TAZ, categorized by trip purpose. After total trips were estimated, the mode share was estimated based on observed local data, and based on City targets for the No Action Alternative. Non-vehicle trips were subtracted out of the total, as only vehicle trips were modeled.

- **Trip Distribution.** The trip distribution step allocates vehicle trips estimated by the trip generation model to create a specific zonal origin and destination for each trip. This is accomplished using the gravity model, which distributes trips according to two basic assumptions: (1) more trips will be attracted to larger zones (the size of a zone is defined by the number of attractions estimated in the trip generation phase, not the geographical size), and (2) more trips will take place between zones that are closer together than the number that will take place between zones that are farther apart. The result is a trip matrix that estimates how many trips occur from each zone (origin) to every other zone (destination). The trips are often referred to as trip interchanges.
- **Network Assignment.** The roadway network is represented as a series of links (roadway segments) and nodes (intersections). Each roadway link and intersection node is assigned a functional classification, with associated characteristics of length, capacity, and speed. This information is used to determine the optimum path between all the zones based on travel time and distance. The trips are distributed from each of the zones to the roadway network using an assignment process that takes into account the effect of increasing traffic on travel times. The result is a roadway network with traffic volumes calculated for each segment of roadway. The model reflects the effects of traffic congestion on the roadway network.
- **Model Validation.** A crucial step in the modeling process is the calibration of the model. The modeling process can generally be described as defining the existing roadway system as a model network and applying trip patterns based on existing land use. The model output, which consists of estimated traffic volumes on each roadway segment, is compared to existing traffic counts. Adjustments are made to the model inputs until the modeled existing conditions replicate actual existing conditions, within accepted parameters. Once the model is validated for existing conditions, it can be used as the basis for analyzing future traffic conditions that result from proposed land use, and for evaluating the effectiveness of potential improvements to the roadway network.

Land Use and Trip Generation for Superblock and Off-Site Alternatives

Table 3.3-9 presents the additional growth assumed under the SEIS alternative scenarios, over No Action, These assumptions are consistent with proposed CBD-5A zoning that requires a minimum 25% retail. The balance is assumed to be office at 75% of the square footage. See Chapter 2 for more detailed discussion of land use assumptions for these alternatives.

For traffic analysis, the number of vehicle trips that would be generated by the land use is projected, using trip generation rates that are derived from observed data (Institute of Transportation Engineers 2003). Table 3.3-10 summarizes the number of PM peak hour vehicle trips projected under the Superblock and Off-Site alternatives. Vehicle trips were estimated using trip generation rates provided in the Trip Generation Manual (Institute of Transportation Engineers 2003). Adjustments to vehicle trips were made, assuming pedestrian and bicycle modes would make up 3.5% of retail trips and 4% of office trips, and 6% of total trips would be made via transit. These mode split assumptions were based upon local census data and CTR data for the City.

Table 3.3-9. Land Use Assumptions for Superblock and Off-Site Alternatives

Scenario	Additional Growth Over No Action Alternative[1]	
	Office (square feet)	Commercial (square feet)
Superblock Alternative	570,500	383,550
Off-Site Alternative		
Substation Block	151,657	101,960
CBD-7 Block	268,428	180,466
CBD-1 Core Block	150,414	101,124
Total	570,500	383,550
Unified Ownership Alternative		
Parkplace Site	288,318	193,837
Post Office Site	282,182	189,713
Total	570,500	383,550

[1]. Development under the Superblock, Off-Site, and Unified Ownership alternatives is assumed to occur by 2014 – so the level of development in these areas is the same under the 2014 and 2022 scenarios.

Table 3.3-10. PM Peak Hour Vehicle Trip Projections for Superblock and Off-Site Alternatives

Scenario	Estimated Trips Over No Action Alternative in 2014 and 2022[1,2]	
	Trips Entering Site	Trips Exiting Site
Superblock Alternative	928	1,073
Off-Site Alternative		
Substation Block	250	290
CBD-7 Block	437	504
CBD-1 Core Block	241	279
Total	928	1,073
Unified Ownership Alternative		
Parkplace Site	473	547
Post Office Site	455	526
Total	928	1,073

[1]. Trip generation for No Action Alternative derived from the BKR model.

[2]. Development under the Superblock, Off-Site and Unified Ownership alternatives is assumed to occur by 2014 – so the level of development in these areas is the same under the 2014 and 2022 scenarios.

[3]. Vehicle trips were estimated using trip generation rates provided in the Trip Generation Manual (Institute of Transportation Engineers 2003). Adjustments to vehicle trips were made, assuming pedestrian and bicycle modes would make up 3.5% of retail trips and 4% of office trips, and 6% of total trips would be made via transit. These mode split assumptions were based on local census data and CTR data for the City.

For the Superblock and Off-Site Alternatives, the trips summarized in Table 3.3-10 were added to the No Action Alternative traffic volumes, and were distributed manually across the road network using an analogy method. Under this method, project-generated traffic distribution was estimated based on regional origin-destination information that was projected for the 2008 FEIS. Because the level of development and overall land use mix for the SEIS alternatives is similar to that of the 2008

FEIS Proposed Action (Jones & Stokes 2008), it was determined that regional distribution of site-generated trips would also be similar (in other words, the ultimate origins and destination of project-generated trips would be similar between alternatives). Therefore, distribution in the downtown area varies between the alternatives, depending on the location of the sites; but outside of the downtown area the trip distribution is generally the same.

Impact Assessment

Impact analysis for roadway operations cumulatively assesses the SEIS alternatives. The following guidelines are applied to identify an adverse impact on roadway operations.

1. For 2014 and 2022 concurrency assessment, an impact is identified and mitigation required if any of the individual intersection V/Cs or subarea average V/Cs exceed the thresholds identified in Table 3.3-3.
2. Based on the City's SEPA thresholds, for 2014 Traffic Impact Analysis, an adverse impact is identified if either of the following conditions occur:
    a. If the intersection is projected to operate at LOS E, an impact is identified and mitigation required if greater than 15% of traffic projected to travel through the intersection is generated by the project.
    b. If the intersection is projected to operate at LOS F, an impact is identified and mitigation required if greater than 5% of traffic projected to travel through the intersection is generated by the project.

The analysis reflects the cumulative effect of the action alternatives; however, each future project applicant would be responsible for mitigating its individual impacts. For impacts to roadway operations, proportional share is measured by the number of vehicle trips contributed by the new development (see Table 3.3-10 for PM peak hour trips estimated under build-out of the action alternatives). Each alternative could include multiple applicants, each of which would need to mitigate its proportional share of impacts.

Traffic Impact Analysis

Table 3.3-11 shows the PM peak hour LOS assessment for the 2014 alternative scenarios.

2014 No Action

The table shows that an adverse LOS impact is identified at the following three intersections:

- Central Way/Parkplace Driveway
- NE 85th Street/114th Avenue NE
- Central Way/4th Street

The results of 2014 No Action analysis is also shown in Figure 3.3-6.

2014 Superblock Alternative

Table 3.3-11 shows the results of LOS assessment for the 2014 Superblock scenario. The table shows that an adverse LOS impact is identified at the following 13 intersections:

- Central Way/Parkplace Driveway

- Kirkland Way/Parkplace Driveway
- Central Way/6th Street
- NE 85th Street/114th Avenue NE
- Kirkland Avenue/3rd Street
- Kirkland Way/6th Street
- Kirkland Avenue/ 6th Street
- Central Way/5th Street
- Central Way/4th Street
- 6th Street/7th Avenue
- Kirkland Way / Kirkland Avenue
- Market Street/15th Avenue
- NE 85th Street/124th Avenue NE

The results of 2014 Superblock analysis are shown in Figure 3.3-7.

2014 Off-Site Alternative

Table 3.3-11 shows the results of LOS assessment for the 2014 Off-Site Alternative scenario. The table shows that an adverse LOS impact is identified at the following 11 intersections:

- Central Way/Parkplace Driveway
- Central Way/6th Street
- NE 85th Street/114th Avenue NE
- Kirkland Avenue / 3rd Street
- Kirkland Way/6th Street
- Kirkland Avenue/6th Street
- Central Way/5th Street
- Central Way/4th Street
- 6th Street/7th Avenue
- Market Street/15th Avenue
- NE 85th Street/124th Avenue NE

The results of 2014 Off-Site Alternative analysis are shown in Figure 3.3-8.

2014 Unified Ownership Alternative

Table 3.3-11 shows the results of LOS assessment for the 2014 Unified Ownership scenario. The table shows that an adverse LOS impact is identified at the following 14 intersections:

- Central Way/Parkplace Driveway
- Kirkland Way/Parkplace Driveway

- Central Way/6th Street
- NE 85th Street/114th Avenue NE
- 6th Street/4th Avenue
- Kirkland Avenue/3rd Street
- Kirkland Way/6th Street
- Kirkland Avenue/ 6th Street
- Central Way/5th Street
- Central Way/4th Street
- 6th Street/7th Avenue
- Kirkland Way / Kirkland Avenue
- Market Street/15th Avenue
- NE 85th Street/124th Avenue NE

The results of 2014 Superblock analysis are shown in Figure 3.3-9.

Table 3.3-11. TIA Assessment - 2014 PM Peak Hour LOS

ID	Intersection	Traffic Control[1]	No Action				Superblock				Off-Site				Unified Ownership			
			LOS	Avg. Delay (sec)	% Impact	Mit[2]	LOS	Avg. Delay (sec)	% Impact	Mit[2]	LOS	Avg. Delay (sec)	% Impact	Mit[2]	LOS	Avg. Delay (sec)	% Impact	Mit[2]
	Southwest Subarea																	
4	Central Way/ Parkplace Driveway	TWS	F	>300	>5	Y	F	>300	8	Y	F	>300	30	Y	F	295	10	Y
7	Kirkland Way/ Parkplace Driveway	TWS	E	42.4	<15	N	F	>300	36	Y	E	47.4	3	N	F	>300	28	Y
101	Lake Washington Blvd/NE 38th Place	Signal	D	49.2	0.2	N	D	48.4	2.0	N	D	48.4	2.0	N	D	48.4	2.0	N
102	Lake Washington Blvd/ Lakeview Dr	Signal	C	20.4	0.3	N	C	22.0	2.6	N	C	22.0	2.6	N	C	22.0	2.6	N
103	State Street/ NE 68th Street	Signal	C	26.7	0.4	N	C	30.7	3.0	N	C	30.7	3.0	N	C	30.7	3.0	N
104	108th Avenue NE/ NE 68th Street	Signal	D	50.5	1.6	N	E	62.0	12.1	N	E	62.0	12.1	N	E	62.0	12.1	N
105	Central Way/ 6th Street	Signal	C	34.5	5.1	N	F	91.9	21	Y	F	109.9	26	Y	F	84.5	24	Y
106	Central Way/ 3rd Street	Signal	C	29.4	1.5	N	C	30.7	--	N	D	36.7	--	N	C	31.5	--	N
107	Central Way/ Lake Street	Signal	D	35.4	1.0	N	D	36.5	--	N	D	39.7	--	N	D	37.1	--	N
108	Lake Street/ Kirkland Avenue	Signal	C	21.2	0.5	N	C	31.5	--	N	C	21.5	--	N	C	29.5	--	N
109	NE 85th Street/ 114th Avenue NE	Signal	F	132.1	5.3	Y	F	227.9	30	Y	F	227.9	30	Y	F	227.9	30	Y

ID	Intersection	Traffic Control[1]	No Action				Superblock				Off-Site				Unified Ownership			
			LOS	Avg. Delay (sec)	% Impact	Mit[2]	LOS	Avg. Delay (sec)	% Impact	Mit[2]	LOS	Avg. Delay (sec)	% Impact	Mit[2]	LOS	Avg. Delay (sec)	% Impact	Mit[2]
110	6th Street/ 4th Avenue	Signal	B	17.5	4.5	N	D	52.6	--	N	C	21.5	--	N	E	57.4	42	Y
111	Kirkland Avenue/ 3rd Street	AWS	D	27.7	1.6	N	F	77	22	Y	F	50.5	11	Y	F	66.2	19	Y
112	Kirkland Way/ 6th Street	AWS	F	149.6	1.6	N	F	>300	33	Y	F	250.8	14	Y	F	>300	29	Y
113	Kirkland Avenue/ 6th Street	TWS	D	27.1	0.0	N	F	82.7	29	Y	E	45	18	Y	F	60.8	25	Y
128	Central Way/ 5th Street	TWS	F	103.5	<5.0	N	F	>300	30	Y	F	>300	31	Y	F	>300	22	Y
129	Central Way/ 4th Street	TWS	F	82.4	>5.0	Y	F	119	9	Y	F	>300	28	Y	F	174.7	11	Y
169	6th Street/ 7th Avenue	AWS	E	45.9	<15	N	F	69.7	7	Y	F	90	14	Y	F	98.5	14	Y
179	Kirkland Way/ Kirkland Avenue	TWS	C	21.2	--	N	F	50.6	28	Y	C	22.9	--	N	E	38.9	24	Y
	Northwest Subarea																	
201	98th Avenue NE/ Juanita Drive	Signal	D	50.9	1.3	N	D	54.6	8.1	N	D	54.6	8.1	N	D	54.6	8.1	N
202	100th Avenue NE/ NE 124th Street	Signal	E	58.3	0.7	N	E	62.6	4.5	N	E	62.6	4.5	N	E	62.6	4.5	N
203	100th Avenue NE/ NE 132nd Street	Signal	E	59.6	0.6	N	E	62.0	3.9	N	E	62.0	3.9	N	E	62.0	3.9	N
205	Market Street/ Forbes Creek	Signal	B	17.5	1.6	N	C	26.9	10.0	N	C	26.9	10.0	N	C	26.9	10.0	N

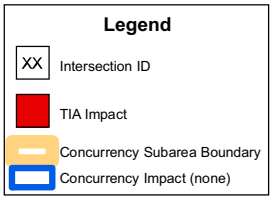
ID	Intersection	Traffic Control[1]	No Action				Superblock				Off-Site				Unified Ownership			
			LOS	Avg. Delay (sec)	% Impact	Mit[2]	LOS	Avg. Delay (sec)	% Impact	Mit[2]	LOS	Avg. Delay (sec)	% Impact	Mit[2]	LOS	Avg. Delay (sec)	% Impact	Mit[2]
206	98th Avenue NE/ NE 120th Place	Signal	B	12.1	0.7	N	B	12.3	4.4	N	B	12.3	4.4	N	B	12.3	4.4	N
208	Juanita Drive/ 97th Avenue NE	Signal	B	19.6	0.5	N	C	22.2	3.1	N	C	22.2	3.1	N	C	22.2	3.1	N
209	Market Street/ 7th Avenue	TWS	F	180.0	0.6	N	F	>300	<5	N	F	>300	<5	N	F	>300	<5	N
211	Market Street/ 15th Avenue	TWS	F	70.1	1.8	N	F	153.3	10.0	Y	F	153.3	10.0	Y	F	153.3	10.0	Y
227	Juanita Drive/ 93rd Avenue NE	TWS	F	>200	1.4	N	F	>200	1.4	N	F	>200	1.4	N	F	>200	1.4	N
	Northeast Subarea																	
301	120th Avenue NE/ NE 132nd Street	Signal	B	19.0	0.3	N	B	19.1	1.4	N	B	19.1	1.4	N	B	19.1	1.4	N
303	120th Avenue NE/ NE 128th Street	Signal	B	14.5	0.4	N	B	14.7	2.4	N	B	14.7	2.4	N	B	14.7	2.4	N
304	NE 132nd Street/ 124th Avenue NE	Signal	F	213.4	0.3	N	F	217.4	1.8	N	F	217.4	1.8	N	F	217.4	1.8	N
306	NE 124th Street/ Slater Avenue NE	Signal	E	62.8	0.8	N	E	63.1	5.1	N	E	63.1	5.1	N	E	63.1	5.1	N
307	Totem Lake Blvd/ 120th Avenue NE	Signal	D	45.5	0.9	N	D	46.6	5.3	N	D	46.6	5.3	N	D	46.6	5.3	N
310	NE 116th Street/ 120th Avenue NE	Signal	D	61.9	0.2	N	D	66.1	1.4	N	D	66.1	1.4	N	D	66.1	1.4	N
311	NE 116th Street/ 124th Avenue NE	Signal	D	45.4	0.5	N	D	48.2	4.6	N	D	48.2	4.6	N	D	48.2	4.6	N

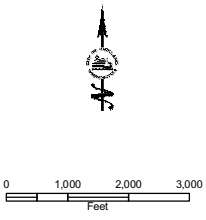
ID	Intersection	Traffic Control[1]	No Action				Superblock				Off-Site				Unified Ownership			
			LOS	Avg. Delay (sec)	% Impact	Mit[2]	LOS	Avg. Delay (sec)	% Impact	Mit[2]	LOS	Avg. Delay (sec)	% Impact	Mit[2]	LOS	Avg. Delay (sec)	% Impact	Mit[2]
312	NE 124th Street/ 116th Avenue NE	Signal	D	50.7	0.2	N	D	52.4	2.0	N	D	52.4	2.0	N	D	52.4	2.0	N
314	Slater Avenue NE/ NE 120th Street	Signal	F	90.6	0.3	N	F	95.1	2.0	N	F	95.1	2.0	N	F	95.1	2.0	N
315	NE 124th Street/ Totem Lake Blvd	Signal	F	108.0	0.5	N	F	110.4	3.2	N	F	110.4	3.2	N	F	110.4	3.2	N
316	Totem Lake Blvd/ NE 132nd Street	Signal	D	48.2	0.2	N	E	48.7	1.1	N	E	48.7	1.1	N	E	48.7	1.1	N
319	I-405/SB On NE 116th Street	TWS	B	13.9	3.5	N	B	14.6	7.9	N	B	14.6	7.9	N	B	14.6	7.9	N
320	I-405/NB Off NE 116th Street	Signal	D	57.3	0.5	N	E	58.0	3.6	N	E	58.0	3.6	N	E	58.0	3.6	N
323	Slater Avenue NE/ NE 116th Street	TWS	E	46.0	0.4	N	E	47.9	3.0	N	E	47.9	3.0	N	E	47.9	3.0	N
	East Subarea																	
401	NE 85th Street/ 132nd Avenue NE	Signal	D	47.8	1.0	N	D	48.3	6.4	N	D	48.3	6.4	N	D	48.3	6.4	N
402	NE 85th Street/ 124th Avenue NE	Signal	E	74.2	1.4	N	F	81.0	9.1	Y	F	81.0	9.1	Y	F	81.0	9.1	Y
403	NE 85th Street/ 120th Avenue NE	Signal	C	29.2	1.7	N	C	30.4	11.1	N	C	30.4	11.1	N	C	30.4	11.1	N
404	124th Avenue NE/ NE 100th Street	Signal	A	8.4	0.4	N	A	9.2	2.5	N	A	9.2	2.5	N	A	9.2	2.5	N
407	NE 70th Street/ 116th Avenue NE	Signal	D	36.0	0.5	N	D	36.8	3.1	N	D	36.8	3.1	N	D	36.8	3.1	N

ID	Intersection	Traffic Control[1]	No Action				Superblock				Off-Site				Unified Ownership			
			LOS	Avg. Delay (sec)	% Impact	Mit[2]	LOS	Avg. Delay (sec)	% Impact	Mit[2]	LOS	Avg. Delay (sec)	% Impact	Mit[2]	LOS	Avg. Delay (sec)	% Impact	Mit[2]
408	NE 90th Street/ 124th Avenue NE	Signal	C	24.4	0.5	N	C	25.7	3.4	N	C	25.7	3.4	N	C	25.7	3.4	N
409	NE 85th Street/ 122nd Avenue NE	Signal	B	15.7	1.5	N	B	15.8	9.7	N	B	15.8	9.7	N	B	15.8	9.7	N
412	NE 85th Street/ 128th Avenue NE	Signal	A	8.0	1.1	N	A	8.4	7.1	N	A	8.4	7.1	N	A	8.4	7.1	N
416	NE 80th Street/ 132nd Avenue NE	AWS	F	56.1	0.2	N	F	58.2	1.4	N	F	58.2	1.4	N	F	58.2	1.4	N

1. AWS = All Way Stop; TWS = Two Way Stop (LOS/Delay shown for worst movement at TWS)
2. Mit = Mitigation; Y = mitigation is needed, based upon City standards – If LOS = E and Project accounts for >15% of traffic through intersection; or if LOS = F and Project accounts for >5% of traffic through intersection
3. Rows that are shaded indicate intersections where impacts have been identified.

Source: Heffron Transportation, Inc. 2008 and ICF 2010





Source: City of Kirkland 2008; ICF 2010

Figure 3.3-6
Traffic Impacts 2014 - No Action Alternative

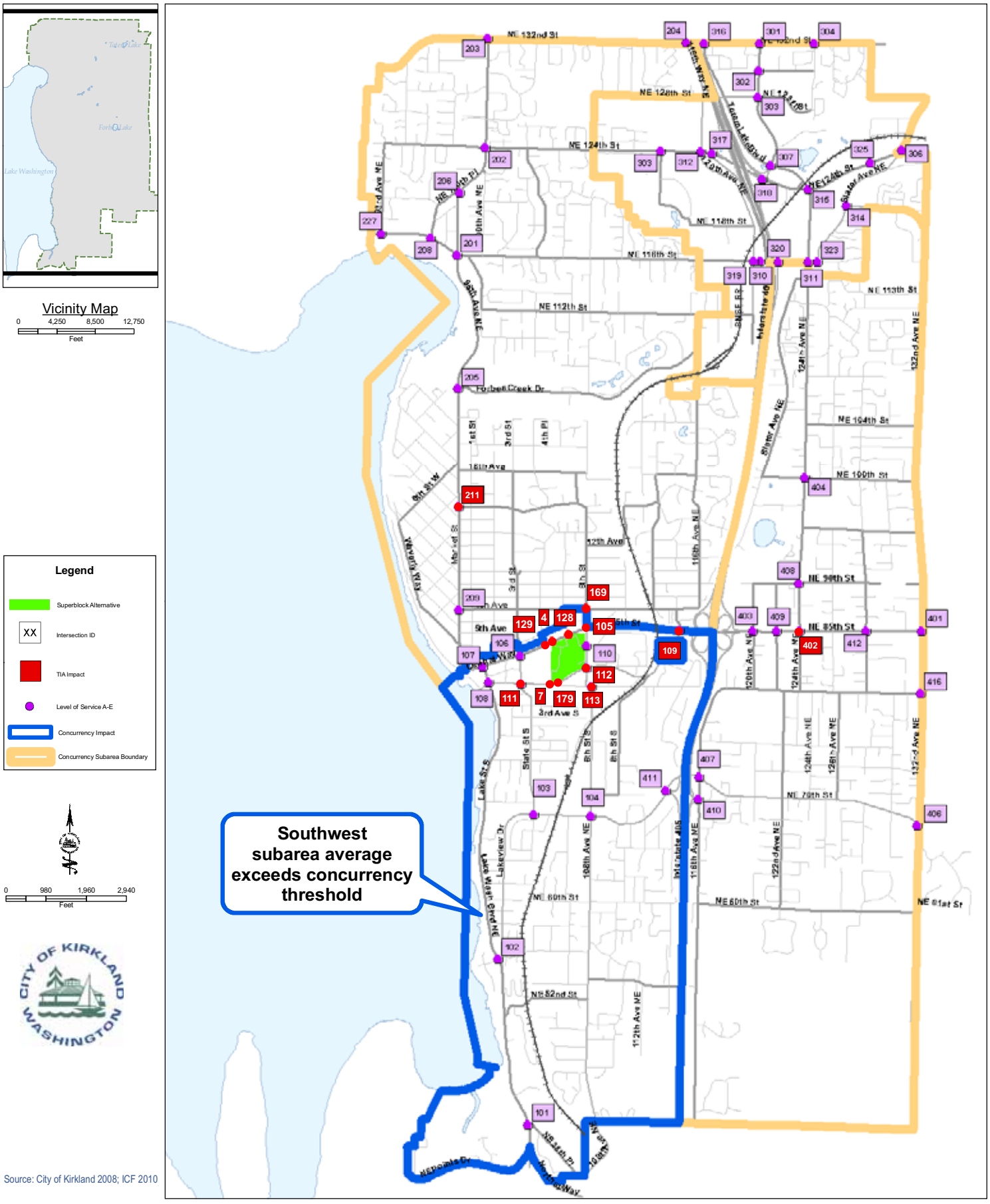


Figure 3.3-7
Traffic Impacts 2014 - Superblock Alternative

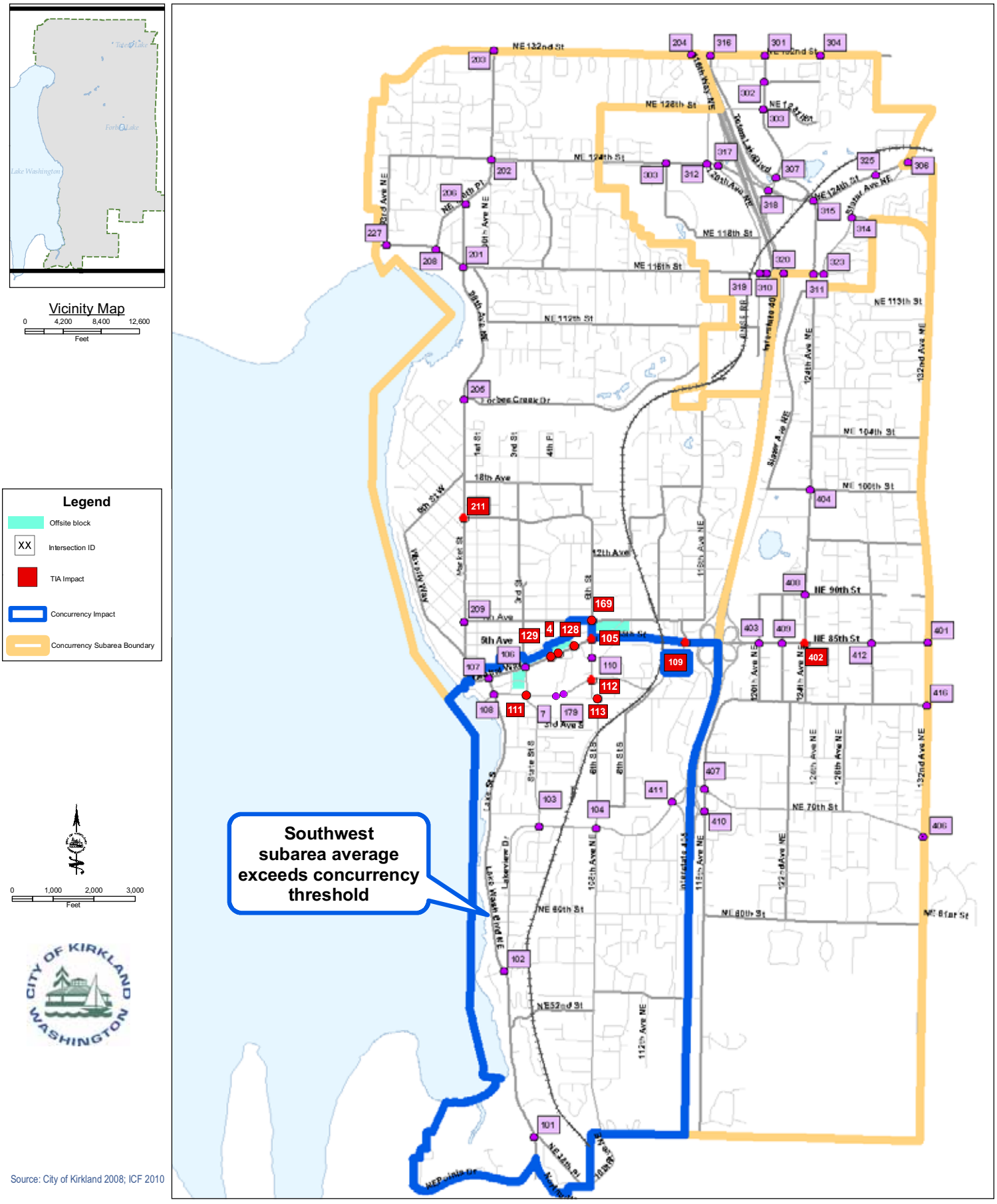


Figure 3.3-8
Traffic Impacts 2014 - Off-site Alternative

Figure 3.3-9
Traffic Impacts 2014 - Unified Ownership Alternative

Concurrency V/C Impacts

2014 Concurrency

Table 3.3-12 shows the results of concurrency assessment for the 2014 No Action Alternative, Superblock, Off-Site, and Unified Ownership alternatives.

2014 No Action Alternative

The table shows that all concurrency intersections and subarea averages are expected to remain below thresholds under this scenario.

2014 Superblock, Off-Site, and Unified Ownership Alternatives

The table shows that deficiencies are projected at the same locations under all three alternatives, though some of the V/C values are slightly different. One intersection located in the southwest region, (109) 114th Ave NE/NE 85th Street, is expected to exceed the concurrency threshold of 1.40. In addition, the subarea average for the southwest subarea is projected to exceed the threshold. The results of 2014 concurrency assessment for the Superblock Alternative, Off-Site Alternative, and Unified Ownership Alternative are shown in Figure 3.3-7, Figure 3.3-8, and Figure 3.3-9, respectively.

Table 3.3-12. 2014 Concurrency Assessment

		No Action			Superblock			Off-Site			Unified Ownership		
ID	Intersection	V/C	Threshold	Mit[1]	V/C	Threshold	Mit[1]	V/C	Threshold	Mit[1]	V/C	Threshold	Mit[1]
	Southwest Subarea												
101	Lake Washington Blvd/NE 38th Place	1.04	1.40	N	1.04	1.40	N	1.04	1.40	N	1.04	1.40	N
102	Lake Washington Blvd/Lakeview Drive	0.73	1.40	N	0.77	1.40	N	0.77	1.40	N	0.77	1.40	N
103	State Street/NE 68th Street	0.65	1.40	N	0.69	1.40	N	0.69	1.40	N	0.69	1.40	N
104	108th Avenue NE/NE 68th Street	1.00	1.40	N	1.07	1.40	N	1.07	1.40	N	1.07	1.40	N
105	6th Street/Central Way	0.89	1.40	N	1.12	1.40	N	1.07	1.40	N	1.24	1.40	N
106	3rd Street/Central Way	0.76	1.40	N	0.81	1.40	N	0.87	1.40	N	0.82	1.40	N
107	Lake Street/Central Way	0.73	1.40	N	0.78	1.40	N	0.81	1.40	N	0.79	1.40	N
108	Lake Street/Kirkland Avenue	0.52	1.40	N	0.65	1.40	N	0.54	1.40	N	0.63	1.40	N
109	114th Ave NE/NE 85th Street	1.30	1.40	N	1.57	1.40	Y	1.57	1.40	Y	1.57	1.40	Y
	Southwest Subarea Average	0.85	0.90	N	0.94	0.90	Y	0.94	0.90	Y	0.96	0.90	Y
	Northwest Subarea												
201	98th Avenue NE/Juanita Drive	0.84	1.40	N	0.88	1.40	N	0.88	1.40	N	0.88	1.40	N
202	100th Avenue NE/NE 124th Street	1.06	1.40	N	1.09	1.40	N	1.09	1.40	N	1.09	1.40	N
203	100th Avenue NE/NE 132nd Street	0.90	1.40	N	0.91	1.40	N	0.91	1.40	N	0.91	1.40	N
204	116th Way NE/NE 132nd Street	0.99	1.40	N	1.00	1.40	N	1.00	1.40	N	1.00	1.40	N
205	Market Street/Forbes Creek Drive	0.60	1.40	N	0.63	1.40	N	0.63	1.40	N	0.63	1.40	N
	Northwest Subarea Average	0.88	0.91	N	0.90	0.91	N	0.90	0.91	N	0.90	0.91	N
	Northeast Subarea												
301	120th Avenue NE/NE 132nd Street	0.73	1.40	N	0.73	1.40	N	0.73	1.40	N	0.73	1.40	N
302	120th Avenue NE/NE 130th Street	0.43	1.40	N	0.44	1.40	N	0.44	1.40	N	0.44	1.40	N
303	120th Avenue NE/NE 128th Street	0.46	1.40	N	0.46	1.40	N	0.46	1.40	N	0.46	1.40	N
304	124th Avenue NE/NE 132nd Street	1.06	1.40	N	1.07	1.40	N	1.07	1.40	N	1.07	1.40	N
306	Slater Avenue NE/NE 124th Street	0.95	1.40	N	0.96	1.40	N	0.96	1.40	N	0.96	1.40	N
307	120th Avenue NE/Totem Lake Blvd	0.98	1.40	N	1.00	1.40	N	1.00	1.40	N	1.00	1.40	N
310	120th Avenue NE/NE 116th Street	0.68	1.40	N	0.69	1.40	N	0.69	1.40	N	0.69	1.40	N
311	124th Avenue NE/NE 116th Street	1.08	1.40	N	1.10	1.40	N	1.10	1.40	N	1.10	1.40	N

		No Action			Superblock			Off-Site			Unified Ownership		
ID	Intersection	V/C	Threshold	Mit[1]	V/C	Threshold	Mit[1]	V/C	Threshold	Mit[1]	V/C	Threshold	Mit[1]
312	116th Avenue NE/NE 124th Street	0.94	1.40	N	0.96	1.40	N	0.96	1.40	N	0.96	1.40	N
313	113th Place NE/NE 124th Street	0.66	1.40	N	0.66	1.40	N	0.66	1.40	N	0.66	1.40	N
314	Slater Avenue NE/NE 120th Street	0.82	1.40	N	0.83	1.40	N	0.83	1.40	N	0.83	1.40	N
315	Totem Lake Boulevard/NE 124th Street	1.00	1.40	N	1.01	1.40	N	1.01	1.40	N	1.01	1.40	N
316	Totem Lake Boulevard/NE 132nd Street	1.09	1.40	N	1.09	1.40	N	1.09	1.40	N	1.09	1.40	N
317	I-405 SB Off Ramp/NE 124th Street	0.71	1.40	N	0.72	1.40	N	0.72	1.40	N	0.72	1.40	N
318	I-405 NB Off Ramp/NE 124th Street	0.55	1.40	N	0.57	1.40	N	0.57	1.40	N	0.57	1.40	N
320	I-405 NB Off Ramp/NE 116th Street	0.83	1.40	N	0.84	1.40	N	0.84	1.40	N	0.84	1.40	N
325	128th Lane NE/NE 124th Street	0.72	1.40	N	0.73	1.40	N	0.73	1.40	N	0.73	1.40	N
	Northeast Subarea Average	0.81	0.89	N	0.81	0.89	N	0.81	0.89	N	0.81	0.89	N
	East Subarea												
401	132nd Avenue NE/NE 85th Street	0.82	1.40	N	0.83	1.40	N	0.83	1.40	N	0.83	1.40	N
402	124th Avenue NE/NE 85th Street	1.07	1.40	N	1.08	1.40	N	1.08	1.40	N	1.08	1.40	N
403	120th Avenue NE/NE 85th Street	0.91	1.40	N	0.92	1.40	N	0.92	1.40	N	0.92	1.40	N
404	124th Avenue NE/NE 100th Street	0.76	1.40	N	0.79	1.40	N	0.79	1.40	N	0.79	1.40	N
406	132nd Avenue NE/NE 70th Street	1.01	1.40	N	1.01	1.40	N	1.01	1.40	N	1.01	1.40	N
407	116th Avenue NE/NE 70th Street	0.95	1.40	N	0.97	1.40	N	0.97	1.40	N	0.97	1.40	N
408	124th Avenue NE/NE 90th Street	0.79	1.40	N	0.82	1.40	N	0.82	1.40	N	0.82	1.40	N
409	122nd Avenue NE/NE 85th Street	0.80	1.40	N	0.81	1.40	N	0.81	1.40	N	0.81	1.40	N
410	116th Avenue NE/I-405 NB Ramps	1.07	1.40	N	1.12	1.40	N	1.12	1.40	N	1.12	1.40	N
411	I-405 SB Ramps/NE 72nd Place	0.32	1.40	N	0.32	1.40	N	0.32	1.40	N	0.32	1.40	N
	East Subarea Average	0.85	1.05	N	0.87	1.05	N	0.87	1.05	N	0.87	1.05	N

1. Mit = Mitigation; Y = mitigation is needed, based upon City standards – If V/C exceeds thresholds defined in Table 3.3-3.
2. Rows that are shaded indicate intersections where impacts have been identified.
Source: Mirai & Associates 2008; Fehr & Peers 2010

2022 Concurrency

Table 3.3-13 shows the results of concurrency assessment for the 2022 No Action, Superblock, Off-Site, and Unified Ownership alternatives.

The table shows that deficiencies are projected at the same locations under all four alternatives, though some of the V/C values are slightly different. Two intersections located in the southwest region are expected to exceed the concurrency threshold of 1.40.

- Lake Washington Boulevard/NE 38th Place
- 114th Ave NE/NE 85th Street

In addition, the subarea average for the southwest subarea exceeds its threshold of 0.92.

One intersection in the northwest subarea, (204) 116th Way NE/NE 132nd Street, is expected to exceed the concurrency threshold of 1.40. The subarea average for the northwest subarea exceeds its threshold of 1.01.

Two intersections in the northeast subarea are expected to exceed the concurrency threshold of 1.40:

- 124th Avenue NE/NE 132nd Street
- Totem Lake Boulevard/NE 132nd Street

However, the subarea average V/C is expected to remain under its threshold.

The results of 2022 concurrency assessment for the No Action Alternative, Superblock Alternative, Off-Site Alternative, and Unified Ownership Alternative are shown in Figure 3.3-10.

Table 3.3-13. 2022 Concurrency Assessment

ID	Intersection	No Action			Superblock			Off-Site			Unified Ownership		
		V/C	Threshold	Mit[1]	V/C	Threshold	Mit[1]	V/C	Threshold	Mit[1]	V/C	Threshold	Mit[1]
	Southwest Subarea												
101	Lake Washington Blvd/NE 38th Place	1.47	1.40	Y	1.48	1.40	Y	1.48	1.40	Y	1.48	1.40	Y
102	Lake Washington Blvd/Lakeview Drive	0.85	1.40	N	0.88	1.40	N	0.88	1.40	N	0.88	1.40	N
103	State Street/NE 68th Street	0.75	1.40	N	0.79	1.40	N	0.79	1.40	N	0.79	1.40	N
104	108th Avenue NE/NE 68th Street	1.08	1.40	N	1.16	1.40	N	1.16	1.40	N	1.16	1.40	N
105	6th Street/Central Way	1.01	1.40	N	1.24	1.40	N	1.19	1.40	N	1.36	1.40	N
106	3rd Street/Central Way	0.89	1.40	N	0.96	1.40	N	1.00	1.40	N	0.95	1.40	N
107	Lake Street/Central Way	0.82	1.40	N	0.87	1.40	N	0.90	1.40	N	0.88	1.40	N
108	Lake Street/Kirkland Avenue	0.54	1.40	N	0.67	1.40	N	0.56	1.40	N	0.65	1.40	N
109	114th Ave NE/NE 85th Street	1.54	1.40	Y	1.41	1.40	Y	1.41	1.40	Y	1.41	1.40	Y
	Southwest Subarea Average	0.99	0.92	Y	1.05	0.92	Y	1.04	0.92	Y	1.06	0.92	Y
	Northwest Subarea												
201	98th Avenue NE/Juanita Drive	0.92	1.40	N	0.98	1.40	N	0.98	1.40	N	0.98	1.40	N
202	100th Avenue NE/NE 124th Street	1.27	1.40	N	1.29	1.40	N	1.29	1.40	N	1.29	1.40	N
203	100th Avenue NE/NE 132nd Street	1.13	1.40	N	1.15	1.40	N	1.15	1.40	N	1.15	1.40	N
204	116th Way NE/NE 132nd Street	1.47	1.40	Y	1.49	1.40	Y	1.49	1.40	Y	1.49	1.40	Y
205	Market Street/Forbes Creek Drive	0.65	1.40	N	0.73	1.40	N	0.73	1.40	N	0.73	1.40	N
	Northwest Subarea Average	1.09	1.01	Y	1.13	1.01	Y	1.13	1.01	Y	1.13	1.01	Y
	Northeast Subarea												
301	120th Avenue NE/NE 132nd Street	0.91	1.40	N	0.91	1.40	N	0.91	1.40	N	0.91	1.40	N
302	120th Avenue NE/NE 130th Street	0.59	1.40	N	0.59	1.40	N	0.59	1.40	N	0.59	1.40	N
303	120th Avenue NE/NE 128th Street	0.70	1.40	N	0.70	1.40	N	0.70	1.40	N	0.70	1.40	N
304	124th Avenue NE/NE 132nd Street	1.43	1.40	Y	1.44	1.40	Y	1.44	1.40	Y	1.44	1.40	Y
306	Slater Avenue NE/NE 124th Street	1.12	1.40	N	1.15	1.40	N	1.15	1.40	N	1.15	1.40	N
307	120th Avenue NE/Totem Lake Blvd	0.86	1.40	N	0.89	1.40	N	0.89	1.40	N	0.89	1.40	N
310	120th Avenue NE/NE 116th Street	0.74	1.40	N	0.76	1.40	N	0.76	1.40	N	0.76	1.40	N

ID	Intersection	No Action			Superblock			Off-Site			Unified Ownership		
		V/C	Threshold	Mit[1]	V/C	Threshold	Mit[1]	V/C	Threshold	Mit[1]	V/C	Threshold	Mit[1]
311	124th Avenue NE/NE 116th Street	1.04	1.40	N	1.07	1.40	N	1.07	1.40	N	1.07	1.40	N
312	116th Avenue NE/NE 124th Street	1.15	1.40	N	1.18	1.40	N	1.18	1.40	N	1.18	1.40	N
313	113th Place NE/NE 124th Street	0.74	1.40	N	0.74	1.40	N	0.74	1.40	N	0.74	1.40	N
314	Slater Avenue NE/NE 120th Street	1.06	1.40	N	1.15	1.40	N	1.15	1.40	N	1.15	1.40	N
315	Totem Lake Boulevard/NE 124th Street	1.31	1.40	N	1.34	1.40	N	1.34	1.40	N	1.34	1.40	N
316	Totem Lake Boulevard/NE 132nd Street	1.69	1.40	Y	1.70	1.40	Y	1.70	1.40	Y	1.70	1.40	Y
317	I-405 SB Off Ramp/NE 124th Street	0.72	1.40	N	0.74	1.40	N	0.74	1.40	N	0.74	1.40	N
318	I-405 NB Off Ramp/NE 124th Street	0.59	1.40	N	0.60	1.40	N	0.60	1.40	N	0.60	1.40	N
320	I-405 NB Off Ramp/NE 116th Street	0.89	1.40	N	0.90	1.40	N	0.90	1.40	N	0.90	1.40	N
325	128th Lane NE/NE 124th Street	0.79	1.40	N	0.81	1.40	N	0.81	1.40	N	0.81	1.40	N
	Northeast Subarea Average	0.96	0.99	N	0.98	0.99	N	0.98	0.99	N	0.98	0.99	N
	East Subarea												
401	132nd Avenue NE/NE 85th Street	1.11	1.40	N	1.13	1.40	N	1.13	1.40	N	1.13	1.40	N
402	124th Avenue NE/NE 85th Street	0.99	1.40	N	1.01	1.40	N	1.01	1.40	N	1.01	1.40	N
403	120th Avenue NE/NE 85th Street	1.02	1.40	N	1.04	1.40	N	1.04	1.40	N	1.04	1.40	N
404	124th Avenue NE/NE 100th Street	0.92	1.40	N	0.96	1.40	N	0.96	1.40	N	0.96	1.40	N
406	132nd Avenue NE/NE 70th Street	0.88	1.40	N	0.88	1.40	N	0.88	1.40	N	0.88	1.40	N
407	116th Avenue NE/NE 70th Street	1.10	1.40	N	1.15	1.40	N	1.15	1.40	N	1.15	1.40	N
408	124th Avenue NE/NE 90th Street	0.98	1.40	N	1.02	1.40	N	1.02	1.40	N	1.02	1.40	N
409	122nd Avenue NE/NE 85th Street	0.89	1.40	N	0.90	1.40	N	0.90	1.40	N	0.90	1.40	N
410	116th Avenue NE/I-405 NB Ramps	1.24	1.40	N	1.35	1.40	N	1.35	1.40	N	1.35	1.40	N
411	I-405 SB Ramps/NE 72nd Place	0.43	1.40	N	0.44	1.40	N	0.44	1.40	N	0.44	1.40	N
	East Subarea Average	0.96	1.10	N	0.99	1.10	N	0.99	1.10	N	0.99	1.10	N

1. Mit = Mitigation; Y = mitigation is needed, based upon City standards – If V/C exceeds thresholds defined in Table 3.3-3.
2. Rows that are shaded indicate intersections where impacts have been identified.
Source: Mirai & Associates 2008 and Fehr & Peers 2010

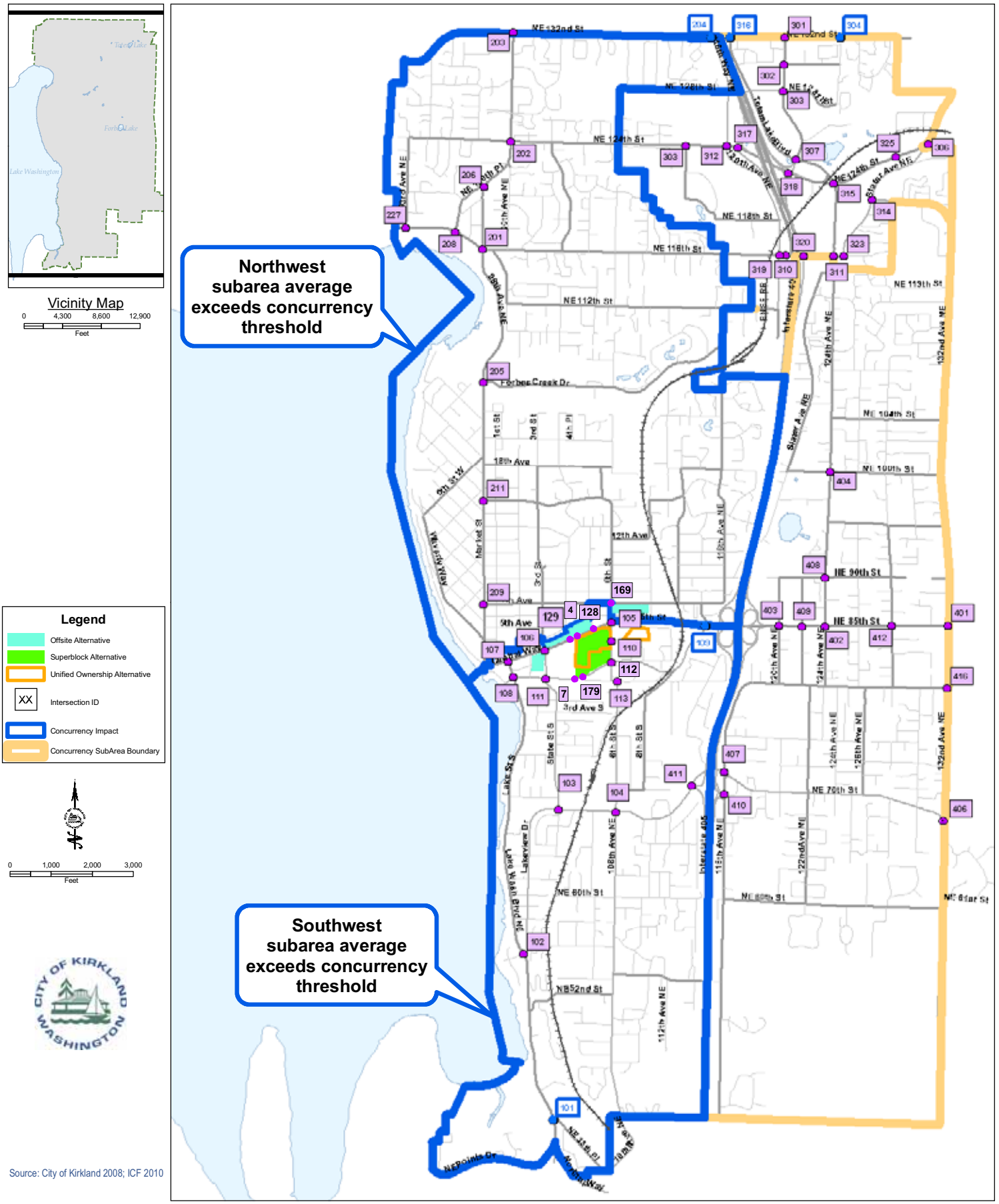


Figure 3.3-10
Traffic Impacts 2022 - No Action, Superblock, Off-site, Unified Ownership Alternatives

Parking

Superblock, Off-Site, and Unified Ownership Alternatives

Table 3.3-14 estimates the parking supply required for the Superblock, Off-Site, and Unified Ownership alternatives, based on current City code. The values shown in the table represent the number of parking spaces that would be required in addition to parking required under the No Action Alternative. Note, since specific development proposals have not been made for the Superblock, Off-Site, or Unified Ownership alternatives, the summary represents a conservative estimate based upon requirements for general office and retail uses. Some specific retail uses, such as restaurants or movie theaters, have lower parking supply requirements under City code. Thus, in actuality, the required number of parking spaces could be somewhat lower, depending on what the actual mix of proposed retail and office development would be. Given their similar growth, the total parking stalls that could be required are the same for the Superblock, Off-Site and Unified Growth alternatives, but would be distributed differently. Individual applicants under any of the alternatives would be required to show in their development applications how they will accommodate on-site the parking that is required under City code.

No Action Alternative

Parking demand would be less under the No Action Alternative than would be expected under the other three alternatives, because the intensity of land use would be less. As no specific development proposal is under evaluation under the No Action Alternative, it is not known if proposed parking would comply with current zoning requirements, or if alternative parking plans would also be proposed under this scenario.

Pedestrian and Bicycle Mobility

Superblock Alternative

The Superblock Alternative would concentrate new development on one large site in the downtown area, providing more opportunity for structured parking and efficient use of land, site amenities that provide non-motorized connectivity, landscaping, and gathering spaces. With these features, this alternative would be more conducive to pedestrian and bicycle mobility, and would likely support the City's non-motorized policies to a greater degree than the No Action Alternative.

Off-Site Alternative

The Off-Site Alternative would concentrate new development on three sites in the downtown area. Because the development would be more spread out and occur incrementally, it would be a less efficient use of land, with likely fewer site amenities that provide non-motorized connectivity, landscaping, and gathering spaces, compared to the Superblock Alternative. However, since it would still result in a higher level of density, this alternative would be more conducive to pedestrian and bicycle mobility, and would likely support the City's non-motorized policies to a greater degree than the No Action Alternative.

Table 3.3-14. Estimate of Parking Requirements over No Action

Land Use	Subsection of KZC 50.37	Estimated Size	Required Parking Spaces	Number of Code Required Spaces
Superblock Alternative				
Office	.070	570,500 sf	1 space/350 sf	1,630
Retail	.050	383,550 sf	1 space/350 sf	1,096
Superblock Total				2,726
Off-Site Alternative				
Substation Block				
Office	.070	151,657 sf	1 space/350 sf	433
Retail	.050	101,960 sf	1 space/350 sf	291
Total				724
CBD-7 Block				
Office	.070	268,429 sf	1 space/350 sf	767
Retail	.050	180,466 sf	1 space/350 sf	516
Total				1,283
CBD-1B Core Block				
Office	.070	150,414 sf	1 space/350 sf	430
Retail	.050	101,124 sf	1 space/350 sf	289
Total				719
Off-Site Alternative Total				2,726
Unified Ownership Alternative				
Parkplace Block				
Office	.070	288,318 sf	1 space/350 sf	824
Retail	.050	193,837 sf	1 space/350 sf	554
Total				1,378
Post Office Block				
Office	.070	282,182 sf	1 space/350 sf	806
Retail	.050	189,713 sf	1 space/350 sf	542
Total				1,348
Unified Ownership Alternative Total				2,726
Off-Site Alternative Total				2,726

sf = square feet

Unified Ownership Alternative

The Unified Ownership Alternative would concentrate new development on two sites in Downtown. Because the development would be spread over two sites, it would be a less efficient use of land, with likely fewer site amenities that provide non-motorized connectivity, landscaping, and gathering spaces, compared to the Superblock Alternative ; but more conducive to pedestrian and bicycle mobility than the Off-Site Alternative. Since it would still result in a higher level of density than No

Action, this alternative would be more conducive to pedestrian and bicycle mobility, and would likely support the City's non-motorized policies to a greater degree than the No Action Alternative.

No Action Alternative

Lower square footages for retail and commercial uses and a potentially less efficient use of land could be less conducive to pedestrian and bicycle mobility and less supportive of the City's non-motorized policies than the three action alternatives. However, there is a greater potential for improved pedestrian and bicycle mobility compared with current conditions.

Transit Service

Superblock Alternative

Higher density under the Superblock Alternative, compared to the No Action Alternative, would be more conducive to transit service and would support the City's transit policies. Recent research has documented the benefits of compact higher density and mixed-use development in supporting improved transit service. While many of these studies focus on residential densities, a report by the PSRC identifies employment densities of 25 jobs per gross acre as a threshold for supporting frequent high-capacity transit service, with a density of 50 jobs per acre as preferred for higher frequency service. As described in Section 3.1, an average density of 378 jobs per acre is estimated for the Superblock Alternative, which far exceeds the PSRC threshold.

The PSRC report identifies that commercial uses with surface parking should strive for a floor area ratio (FAR)—which is the gross floor area of all buildings permitted on a lot divided by the area of the lot—of at least 0.5 to 1.0, and preferably 2.0. As described in Chapter 2, the FAR under the Superblock Alternative is approximately 2.63, well above the preferred threshold for frequent transit service (Puget Sound Regional Council 1999).

The transit center is located well within 0.25 mile of the site, on the other side of Peter Kirk Park. Direct access between the site and the transit center is already provided through Peter Kirk Park. Existing transit service within the City would be adequate to support new development at this site.

Off-Site Alternative

Higher density under the Off-Site Alternative, compared to No Action, would be more conducive to transit service and would support the City's transit policies. As described in Chapter 2, the FAR under the Off-Site Alternative ranges between 0.87 and 3.3, varying between the three sites, but all are above the PSRC threshold for frequent transit service described above. An average density of 338 jobs per acre is estimated for the Off-Site Alternative as a whole, which far exceeds the PSRC threshold. As described in Section 3.1, by individual block the Off-Site Alternative would create a jobs density of 309 jobs/acre for the Substation Block, 343 jobs/acre for the CBD-7 Block, and 379 jobs/acre for the CBD-1B Block.

The transit center is located well within 0.25 mile of all two of the three blocks. The CBD-1B Core Block is located across the street from the transit center, and the CBD-7 Block and Substation Block are located a little farther away at about 0.46 mile. Direct access between the sites and the transit center is already provided via City sidewalks. Existing transit service within the City would be adequate to support new development at these sites.

Unified Ownership Alternative

Higher density under the Unified Ownership Alternative, compared to No Action, would be more conducive to transit service and would support the City's transit policies. As described in Chapter 2, the FAR under the Unified Ownership Alternative ranges between 2.63 and 3.29, varying between the two sites, but all are above the PSRC threshold for frequent transit service described above. As described in Section 3.1, the Parkplace site would have a jobs density of 389 jobs/acre and the Post Office site has a job density of 497 jobs/acre, which far exceeds the PSRC threshold.

The transit center is located well within 0.25 mile of Parkplace, on the other side of Peter Kirk Park. Direct access between the sites and the transit center is already provided through Peter Kirk Park; travelers accessing from the Post Office site would need to go through or past the Parkplace block to access the transit center and would be more than 0.25 mile away. Existing transit service within the City would be adequate to support new development at these sites.

No Action Alternative

Under the No Action Alternative, increased residential and employment growth is anticipated, although to a lesser degree than under the three action alternatives. Therefore, it is reasonable to expect that the No Action Alternative would support increased transit service, although to a lesser degree than the other alternatives. The No Action Alternative is expected to result in a floor area ratio of 1.4, which is above the minimum threshold identified by the PSRC to support frequent high capacity transit service, but below the ideal threshold of 2.0. As described in Section 3.1, with the No Action Alternative, the estimated employment density would be 255 jobs per acre on the Parkplace site, and 104 jobs per acre on the Parkplace North (Primeau) site, exceeding the PSRC thresholds, though lower than the estimated densities for the other DSEIS alternatives.

Construction Traffic

During development of the Superblock, Off-Site, Unified Ownership or No Action alternatives, construction activities will disrupt vehicular and pedestrian traffic. Construction traffic will be particularly disruptive during earth excavation and concrete pours as these activities will generate the largest construction traffic volumes. This increase in traffic may be offset by the loss of existing vehicular trips due to demolition of existing buildings prior to commencement of construction. Street closures are unlikely; however, closure of traffic and/or parking lanes may be required. As no single development proposal or master plan is proposed under the four alternatives, it expected that development would occur incrementally under each alternative. Thus, the timing and duration of construction is uncertain, but would be expected to occur over a longer time period than the time under a single development proposal.

All building permits issued by the City are reviewed and conditioned to mitigate construction traffic impacts by the Public Works director. When a permit is issued, the applicant is required to develop and submit a traffic control plan and a contractor parking plan. The Public Works traffic engineer reviews each building permit and requires special construction traffic conditions depending on the scope and nature of the permit and the timing of the project in relation to other project permits. These permits may include the following measures:

- Provide on-site or nearby parking for construction workers.

- Restrict major removal and delivery of material to and from the site to the Central Avenue corridor east of 6th Street.
- Provide flaggers to direct traffic when appropriate.
- Provide on-site loading areas for removal and delivery of materials.
- Prohibit truck movements to the site during the PM traffic peak hours.
- Provide temporary sidewalks when existing sidewalks are blocked.
- Adjust traffic signal phasing and timing to reduce traffic congestion.

Greenhouse Gases

A greenhouse gas (GHG) assessment was conducted for the City of Kirkland Downtown Planned Action Ordinance (ICF Jones & Stokes 2008), which summarized the estimated 62.5-year lifecycle GHG emissions for existing conditions, the proposed action, and No Action Alternative. Since the overall level development in No Action Alternative is the same as that was analyzed previously, and in the Superblock, Off-Site, and Unified Ownership alternatives is at the same level as the previous proposed action (though distributed differently within the downtown area), it is expected that the resulting GHG emissions would be similar to the previous calculations. Thus the analysis is not repeated in this DSEIS, but may be referenced in the 2008 EIS.

3.3.3 Mitigation Measures

Capacity Improvements

Table 3.4-15 presents the capacity improvement projects that have been developed to address the LOS and concurrency impacts identified for the No Action Alternative, Superblock, Off-Site, and Unified Ownership scenarios. The mitigation measures for the three alternatives are shown in Figure 3.4-11, Figure 3.4-12, Figure 3.3-13and Figure 3.3-14, respectively.

Mitigation measures identified in this DSEIS for the No Action Alternative represent required mitigation to resolve traffic impacts identified through the TIA and concurrency analyses. The mitigation measures identified under the Superblock, Off-Site, and Unified Ownership alternatives are additional mitigation measures needed to resolve traffic impacts caused by the incremental increase in development above the No Action Alternative.

Table 3.3-15. Potential Capacity Improvements to Address Impacts

ID	Location	Improvement	No Action			Superblock			Off-Site			Unified Ownership		
			2014 TIA	2014 Conc	2022 Conc	2014 TIA	2014 Conc	2022 Conc	2014 TIA	2014 Conc	2022 Conc	2014 TIA	2014 Conc	2022 Conc
4	Central Way/ Parkplace Driveway	Install signal	X			X			X			X		
7	Kirkland Way/ Parkplace Driveway	Install signal and add an eastbound left turn lane. Provide protected/permitted left-turn phase for eastbound left turn.				X						X		
101	Lake Washington Boulevard/N E 38th Place	Add 720-ft right lane on northbound receiving lanes (north of the Intersection), modified to extend up to NE 43rd St w/ bike lanes)			X			X			X			X
105	Central Way/ 6th Street	Construct dual westbound left turn lane. Modify signal to provide westbound left/northbound right overlap phase.				X			X			X		

ID	Location	Improvement	No Action			Superblock			Off-Site			Unified Ownership		
			2014 TIA	2014 Conc	2022 Conc	2014 TIA	2014 Conc	2022 Conc	2014 TIA	2014 Conc	2022 Conc	2014 TIA	2014 Conc	2022 Conc
109	NE 85th Street/114th Avenue NE	Restripe southbound dual left and eastbound right to through conversion. (CIP Project #TR-0079). HOV queue bypass for the eastbound-to-southbound on-ramp.	X		X	X	X	X	X	X	X	X	X	X
		Add a dual left turn lane for southbound approach and restripe the southbound through lane to a through-right lane. Modify northbound and southbound split phases to provide protected phase for southbound left turn and permitted phase for northbound left turn.						X			X			X
110	6th Street/ 4th Avenue	Add an eastbound left turn lane and restripe the existing eastbound lane to a through-right lane. Change the signal to a split phase for eastbound and westbound approaches and coordinate signal timing with Central Way/6th Street.										X		
111	Kirkland Avenue/ 3rd Street	Install a signal.				X			X			X		
112	Kirkland Way/ 6th Street	Install signal. (CIP Project #TR20-3)				X			X			X		
113	Kirkland Avenue/ 6th Street	Install a semi-actuated signal.				X			X			X		

ID	Location	Improvement	No Action			Superblock			Off-Site			Unified Ownership		
			2014 TIA	2014 Conc	2022 Conc	2014 TIA	2014 Conc	2022 Conc	2014 TIA	2014 Conc	2022 Conc	2014 TIA	2014 Conc	2022 Conc
128	Central Way/ 5th Street	Install signal.				X			X			X		
129	Central Way/ 4th Street	Move crosswalk to Parkplace signal and extend two-way left turn lane.	X			X			X			X		
		Add southbound left-turn lane. After crosswalk is moved, remove traffic-calming device at the previous location and restore second eastbound through lane.							X					
169	6th Street/ 7th Avenue	Add left turn lanes on northbound and southbound approaches				X			X			X		
179	Kirkland Way/ Kirkland Avenue	Extend two-way left-turn (150 feet) from Parkplace signal (ID 7) and move crosswalk to Parkplace signal (ID 7)				X						X		
202	100th Avenue NE/ NE 124th Street[2]	Modify the signal phase to be the same as during AM peak period. NB and SB to be split phase. The SB lane configuration change to left, left/through shared and through/right shared during the peak period.						X			X			X
204	116th Way NE/NE 132nd Street	Reconfigure the intersection based on the 132nd Street Study and new I-405 northbound on-ramp			X			X			X			X
211	Market Street/ 15th Avenue	Install signal.				X			X			X		

ID	Location	Improvement	No Action			Superblock			Off-Site			Unified Ownership		
			2014 TIA	2014 Conc	2022 Conc	2014 TIA	2014 Conc	2022 Conc	2014 TIA	2014 Conc	2022 Conc	2014 TIA	2014 Conc	2022 Conc
304	NE 132nd Street/124th Street NE	Construct eastbound dual left turn lane, based on the 132nd Street Study			X			X			X			X
316	Totem Lake Boulevard/ NE 132nd Street	Reconfigure the intersection based on the 132nd Street Study and new I-405 northbound on-ramp			X			X			X			X
402	NE 85th Street/124th Avenue NE	Add northbound right-turn-only pocket				X			X			X		

1. TIA = Traffic Impact Analysis; Conc = Concurrency

2. No concurrency impact was identified at this intersection. This mitigation measure is recommended in order to improve conditions in the subarea, to address the concurrency impact that was identified in the northwest subarea under the 2022 action scenarios.

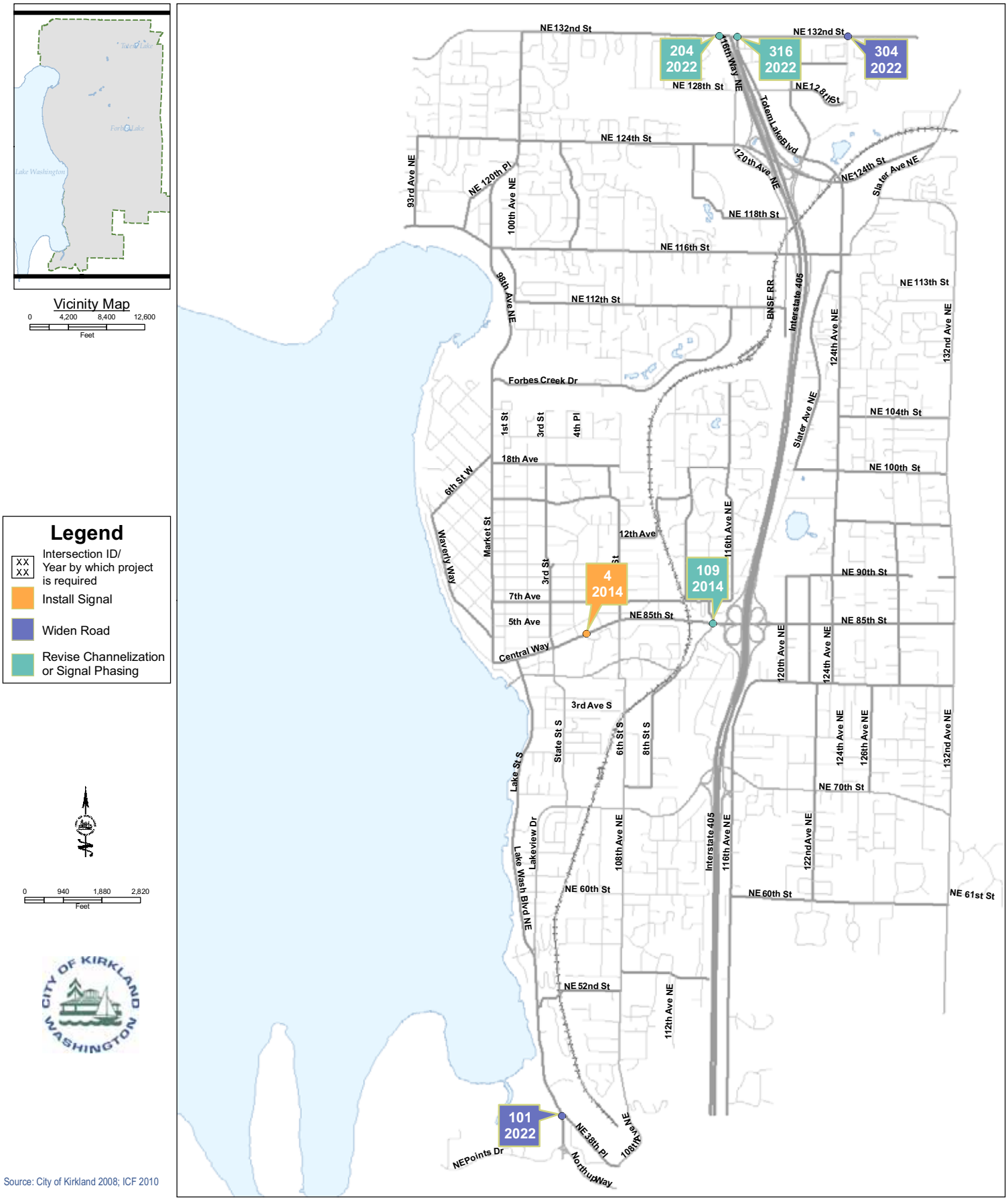
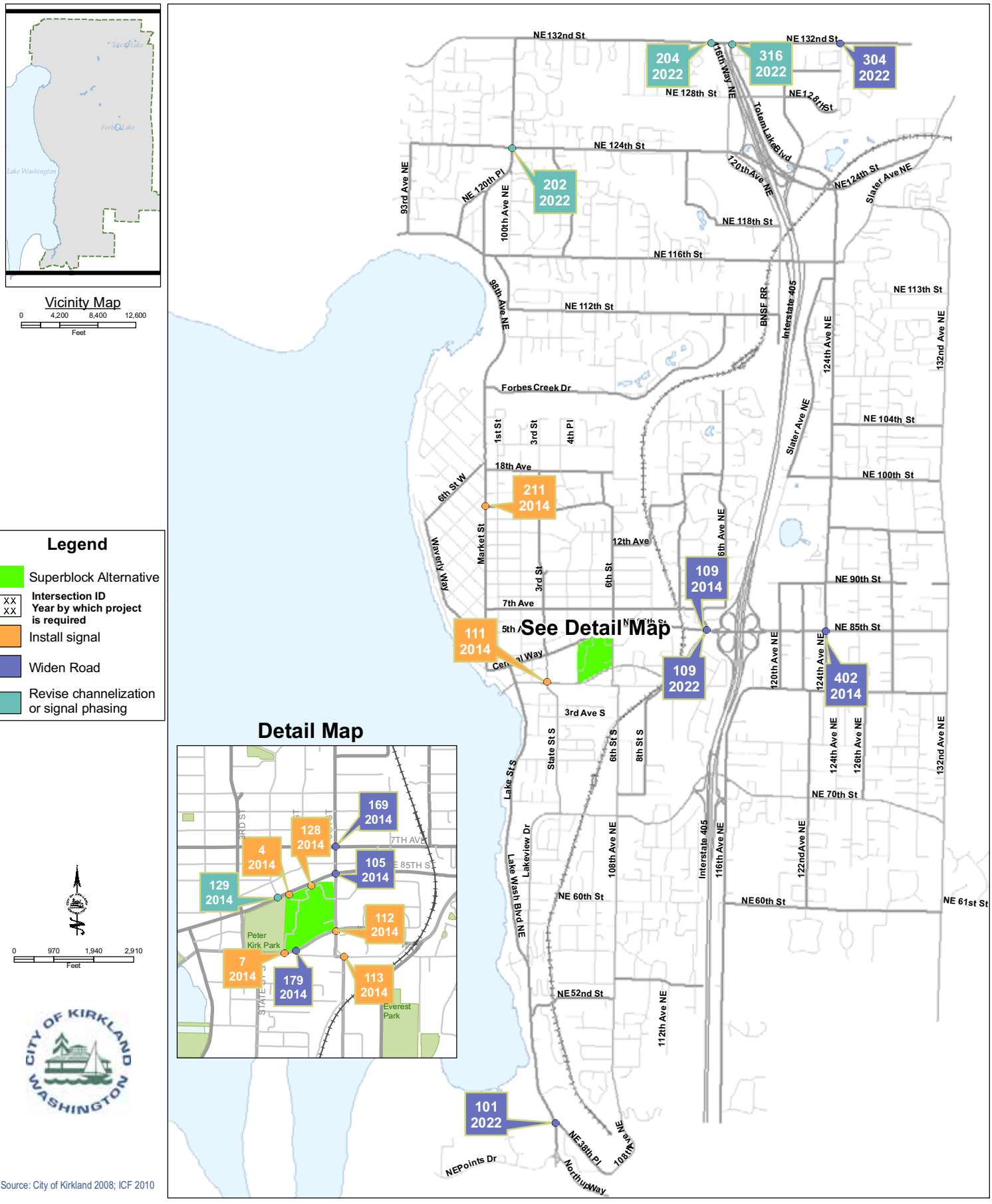
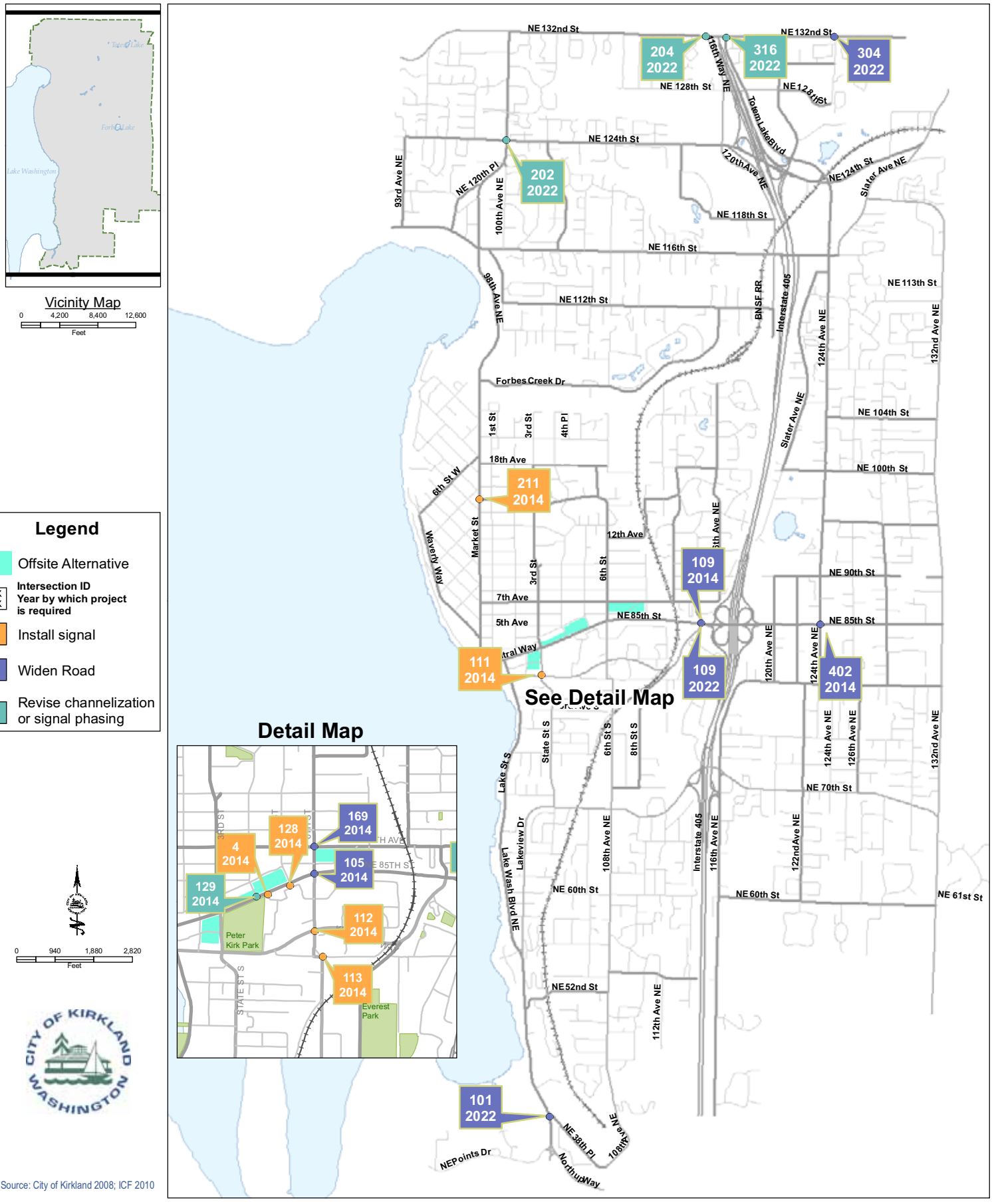


Figure 3.3-11
Summary of Improvements - No Action Alternative



Source: City of Kirkland 2008; ICF 2010

Figure 3.3-12
Summary of Improvements - Superblock Alternative



Source: City of Kirkland 2008; ICF 2010

Figure 3.3-13
Summary of Improvements - Off-site Alternative

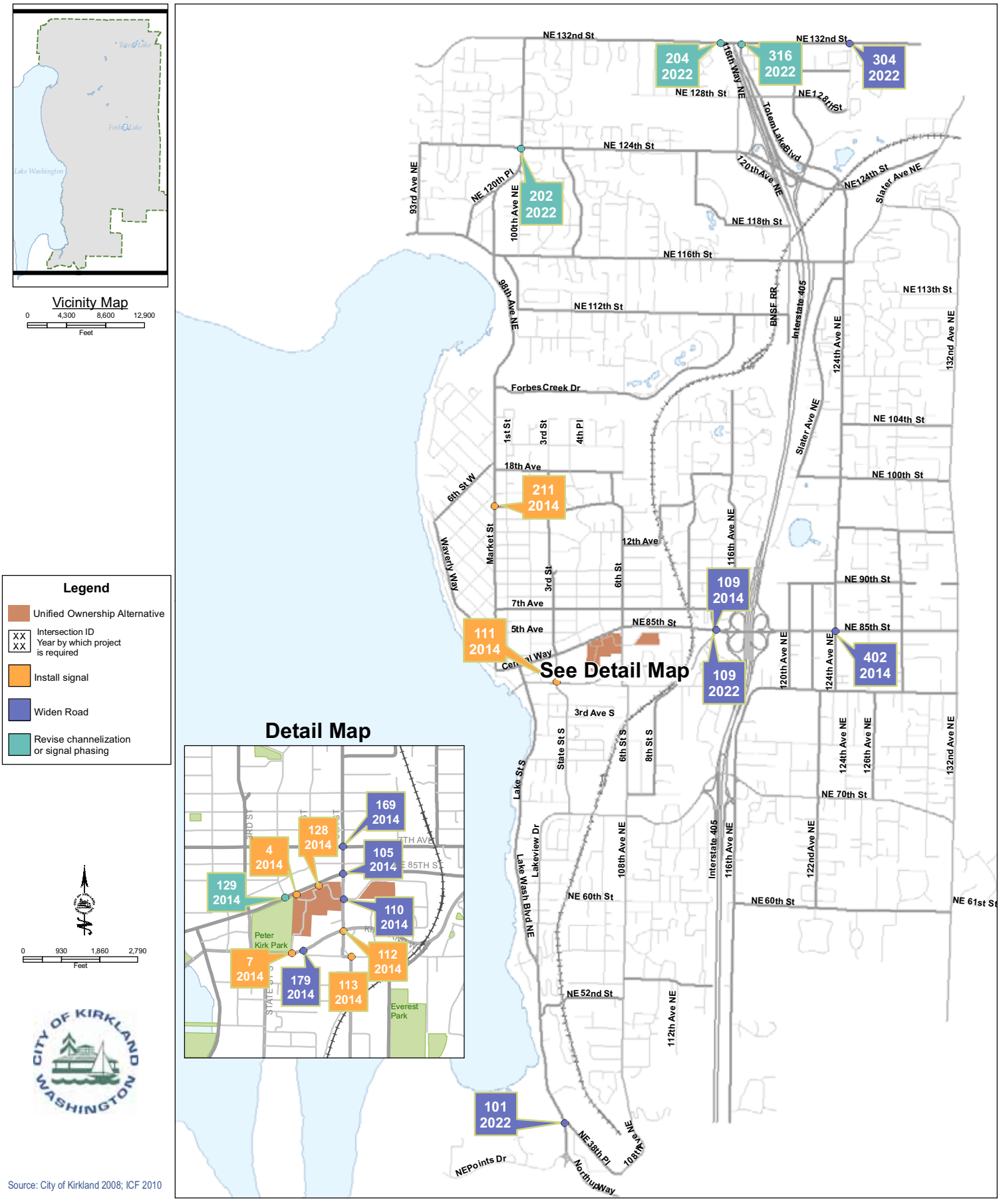


Figure 3.3-14
Summary of Improvements - Unified Ownership Alternative

TIA Results with Mitigation

Table 3.3-16 presents the 2014 PM peak LOS and average under the four scenarios, with mitigation in place. Note, the table shows results only at the locations where impacts were identified. Projected LOS and delay at all other locations are the same as shown in Table 3.3-11. The tables show that the resulting LOS for all intersections except one would be LOS E or better under both scenarios. The intersection that would remain at LOS F, NE 85th Street / 114th Avenue NE, would be improved to operate at better conditions (note, this intersection is operating at LOS F under existing conditions).

Concurrency Results with Mitigation

2014 Conditions

Table 3.3-17 shows the results of 2014 concurrency assessment for the four alternatives with mitigation in place. The table shows that all concurrency intersections and subarea averages are expected to remain below thresholds under all scenarios. Note, under the 2014 No Action Alternative, no mitigation would be required to address concurrency because only TIA impacts were identified; no adverse concurrency impacts were identified.

2022 Conditions

Table 3.3-18 shows the results of concurrency assessment for the four alternatives with mitigation in place. The table shows that all concurrency intersections and subarea averages are expected to remain below thresholds under all scenarios.

Table 3.3-16. 2014 TIA Assessment for SEIS Alternatives - PM Peak Hour LOS with Mitigation

			No Action				Superblock				Off-Site				Unified Ownership			
			Unmitigated		Mitigated		Unmitigated		Mitigated		Unmitigated		Mitigated		Unmitigated		Mitigated	
ID	Intersection	Traffic Control[1]	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
4	Central Way/ Parkplace Driveway	Signal	F	>200	A	10.0	F	>300	B	11.8	F	>300	B	18.4	F	295	B	10.6
7	Kirkland Way/ Parkplace Driveway	Signal	-	-	-	-	F	>300	D	37.0	-	-	-	-	F	>300	C	20.8
105	Central Way/ 6th Street	Signal	-	-	-	-	F	91.9	D	47.2	F	109.9	D	42.3	F	84.5	D	36.9
109	NE 85th St/ 114th Ave NE	Signal	F	132.1	F	93.0	F	227.9	F	103.5	F	227.9	F	103.5	F	227.9	F	103.5
110	6th Street/ 4th Avenue	Signal	-	-	-	-	-	-	-	-	-	-	-	-	E	57.4	D	53.7
111	Kirkland Ave/ 3rd Street	Signal	-	-	-	-	F	77.0	B	13.9	F	50.5	B	10.5	F	66.2	B	12.8
112	Kirkland Wy/ 6th Street	Signal	-	-	-	-	F	>300	D	50.1	F	250.8	B	19.4	F	>300	D	38.0
113	Kirkland Ave/ 6th Street	Signal	-	-				82.7	A	4.6	E	45.0	A	4.9	F	60.8	A	4.4
128	Central Way/ 5th Street	Signal	-	-	-	-	F	>300	C	24.8	F	>300	A	9.8	F	>300	B	10.8
129	Central Way/ 4th Street	TWS	F	82.4	C	18.1	F	83.9	C	22.5	F	>300	D	26.5	F	174.7	C	23.7
169	6th Street/ 7th Avenue	AWS	-	-	-	-	F	69.7	D	34.8	F	90	E	45.8	F	98.5	E	48.6
179	Kirkland Way/ Kirkland Ave	TWS	-	-			F	50.8	C	18.3	-	-	-	-	E	38.9	C	17.0

[1] Traffic control for mitigated conditions. AWS = All Way Stop; TWS = Two Way Stop (LOS/Delay shown for worst movement at TWS)

Table 3.3-17. Concurrency Assessment – 2014 with Mitigation

		No Action		Superblock		Off-Site		Unified Ownership	
ID	Intersection	V/C	Threshold	V/C	Threshold	V/C	Threshold	V/C	Threshold
	Southwest Subarea								
101	Lake Washington Blvd/NE 38th Place	1.04	1.40	1.04	1.40	1.04	1.40	1.04	1.40
102	Lake Washington Blvd/Lakeview Drive	0.73	1.40	0.77	1.40	0.77	1.40	0.77	1.40
103	State Street/NE 68th Street	0.65	1.40	0.69	1.40	0.69	1.40	0.69	1.40
104	108th Avenue NE/NE 68th Street	1.00	1.40	1.07	1.40	1.07	1.40	1.07	1.40
105	6th Street/Central Way	0.89	1.40	1.03	1.40	0.99	1.40	1.10	1.40
106	3rd Street/Central Way	0.76	1.40	0.77	1.40	0.77	1.40	0.82	1.40
107	Lake Street/Central Way	0.73	1.40	0.75	1.40	0.75	1.40	0.79	1.40
108	Lake Street/Kirkland Avenue	0.52	1.40	0.52	1.40	0.52	1.40	0.63	1.40
109	114th Ave NE/NE 85th Street	1.30	1.40	1.23	1.40	1.23	1.40	1.23	1.40
	Southwest Subarea Average	0.85	0.90	0.90	0.90	0.89	0.90	0.90	0.90
	Northwest Subarea								
201	98th Avenue NE/Juanita Drive	0.84	1.40	0.88	1.40	0.88	1.40	0.88	1.40
202	100th Avenue NE/NE 124th Street	1.06	1.40	1.09	1.40	1.09	1.40	1.09	1.40
203	100th Avenue NE/NE 132nd Street	0.90	1.40	0.91	1.40	0.91	1.40	0.91	1.40
204	116th Way NE/NE 132nd Street	0.99	1.40	1.00	1.40	1.00	1.40	1.00	1.40
205	Market Street/Forbes Creek Drive	0.60	1.40	0.63	1.40	0.63	1.40	0.63	1.40
	Northwest Subarea Average	0.88	0.91	0.90	0.91	0.90	0.91	0.90	0.91
	Northeast Subarea								
301	120th Avenue NE/NE 132nd Street	0.73	1.40	0.73	1.40	0.73	1.40	0.73	1.40
302	120th Avenue NE/NE 130th Street	0.43	1.40	0.44	1.40	0.44	1.40	0.44	1.40
303	120th Avenue NE/NE 128th Street	0.46	1.40	0.46	1.40	0.46	1.40	0.46	1.40
304	124th Avenue NE/NE 132nd Street	1.06	1.40	1.07	1.40	1.07	1.40	1.07	1.40
306	Slater Avenue NE/NE 124th Street	0.95	1.40	0.96	1.40	0.96	1.40	0.96	1.40
307	120th Avenue NE/Totem Lake Blvd	0.98	1.40	1.00	1.40	1.00	1.40	1.00	1.40
310	120th Avenue NE/NE 116th Street	0.68	1.40	0.69	1.40	0.69	1.40	0.69	1.40
311	124th Avenue NE/NE 116th Street	1.08	1.40	1.10	1.40	1.10	1.40	1.10	1.40
312	116th Avenue NE/NE 124th Street	0.94	1.40	0.96	1.40	0.96	1.40	0.96	1.40
313	113th Place NE/NE 124th Street	0.66	1.40	0.66	1.40	0.66	1.40	0.66	1.40

		No Action		Superblock		Off-Site		Unified Ownership	
ID	**Intersection**	**V/C**	**Threshold**	**V/C**	**Threshold**	**V/C**	**Threshold**	**V/C**	**Threshold**
314	Slater Avenue NE/NE 120th Street	0.82	1.40	0.83	1.40	0.83	1.40	0.83	1.40
315	Totem Lake Boulevard/NE 124th Street	1.00	1.40	1.01	1.40	1.01	1.40	1.01	1.40
316	Totem Lake Boulevard/NE 132nd Street	1.09	1.40	1.09	1.40	1.09	1.40	1.09	1.40
317	I-405 SB Off Ramp/NE 124th Street	0.71	1.40	0.72	1.40	0.72	1.40	0.72	1.40
318	I-405 NB Off Ramp/NE 124th Street	0.55	1.40	0.57	1.40	0.57	1.40	0.57	1.40
320	I-405 NB Off Ramp/NE 116th Street	0.83	1.40	0.84	1.40	0.84	1.40	0.84	1.40
325	128th Lane NE/NE 124th Street	0.72	1.40	0.73	1.40	0.73	1.40	0.73	1.40
	Northeast Subarea Average	0.81	0.89	0.81	0.89	0.81	0.89	0.81	0.89
	East Subarea								
401	132nd Avenue NE/NE 85th Street	0.82	1.40	0.83	1.40	0.83	1.40	0.83	1.40
402	124th Avenue NE/NE 85th Street	1.07	1.40	1.08	1.40	1.08	1.40	1.08	1.40
403	120th Avenue NE/NE 85th Street	0.91	1.40	0.92	1.40	0.92	1.40	0.92	1.40
404	124th Avenue NE/NE 100th Street	0.76	1.40	0.79	1.40	0.79	1.40	0.79	1.40
406	132nd Avenue NE/NE 70th Street	1.01	1.40	1.01	1.40	1.01	1.40	1.01	1.40
407	116th Avenue NE/NE 70th Street	0.95	1.40	0.97	1.40	0.97	1.40	0.97	1.40
408	124th Avenue NE/NE 90th Street	0.79	1.40	0.82	1.40	0.82	1.40	0.82	1.40
409	122nd Avenue NE/NE 85th Street	0.80	1.40	0.81	1.40	0.81	1.40	0.81	1.40
410	116th Avenue NE/I-405 NB Ramps	1.07	1.40	1.12	1.40	1.12	1.40	1.12	1.40
411	I-405 SB Ramps/NE 72nd Place	0.32	1.40	0.32	1.40	0.32	1.40	0.32	1.40
	East Subarea Average	0.85	1.05	0.87	1.05	0.87	1.05	0.87	1.05

Note: Shaded cells indicate locations where impacts were identified and mitigation proposed.
Source: Mirai & Associates 2008; Fehr & Peers 2010

Table 3.3-18. Concurrency Assessment – 2022 with Mitigation

		No Action		Superblock		Off-Site		Unified Ownership	
ID	Intersection	V/C	Threshold	V/C	Threshold	V/C	Threshold	V/C	Threshold
	Southwest Subarea								
101	Lake Washington Blvd/NE 38th Place	0.83	1.40	0.84	1.40	0.84	1.40	0.84	1.40
102	Lake Washington Blvd/Lakeview Drive	0.85	1.40	0.88	1.40	0.88	1.40	0.88	1.40
103	State Street/NE 68th Street	0.75	1.40	0.79	1.40	0.79	1.40	0.79	1.40
104	108th Avenue NE/NE 68th Street	1.08	1.40	1.16	1.40	1.16	1.40	1.16	1.40
105	6th Street/Central Way	1.01	1.40	1.15	1.40	1.09	1.40	1.18	1.40
106	3rd Street/Central Way	0.89	1.40	0.93	1.40	0.93	1.40	0.95	1.40
107	Lake Street/Central Way	0.82	1.40	0.85	1.40	0.85	1.40	0.88	1.40
108	Lake Street/Kirkland Avenue	0.54	1.40	0.55	1.40	0.55	1.40	0.65	1.40
109	114th Ave NE/NE 85th Street	1.35	1.40	0.97	1.40	0.97	1.40	0.97	1.40
	Southwest Subarea Average	0.90	0.92	0.92	0.92	0.91	0.92	0.92	0.92
	Northwest Subarea								
201	98th Avenue NE/Juanita Drive	0.92	1.40	0.98	1.40	0.98	1.40	0.98	1.40
202	100th Avenue NE/NE 124th Street	1.27	1.40	1.15	1.40	1.15	1.40	1.15	1.40
203	100th Avenue NE/NE 132nd Street	1.13	1.40	1.15	1.40	1.15	1.40	1.15	1.40
204	116th Way NE/NE 132nd Street	1.02	1.40	1.03	1.40	1.03	1.40	1.03	1.40
205	Market Street/Forbes Creek Drive	0.65	1.40	0.73	1.40	0.73	1.40	0.73	1.40
	Northwest Subarea Average	1.00	1.01	1.01	1.01	1.01	1.01	1.01	1.01
	Northeast Subarea								
301	120th Avenue NE/NE 132nd Street	0.91	1.40	0.91	1.40	0.91	1.40	0.91	1.40
302	120th Avenue NE/NE 130th Street	0.59	1.40	0.59	1.40	0.59	1.40	0.59	1.40
303	120th Avenue NE/NE 128th Street	0.70	1.40	0.70	1.40	0.70	1.40	0.70	1.40
304	124th Avenue NE/NE 132nd Street	1.35	1.40	1.36	1.40	1.36	1.40	1.36	1.40
306	Slater Avenue NE/NE 124th Street	1.12	1.40	1.15	1.40	1.15	1.40	1.15	1.40
307	120th Avenue NE/Totem Lake Blvd	0.86	1.40	0.89	1.40	0.89	1.40	0.89	1.40
310	120th Avenue NE/NE 116th Street	0.74	1.40	0.76	1.40	0.76	1.40	0.76	1.40
311	124th Avenue NE/NE 116th Street	1.04	1.40	1.07	1.40	1.07	1.40	1.07	1.40
312	116th Avenue NE/NE 124th Street	1.15	1.40	1.18	1.40	1.18	1.40	1.18	1.40
313	113th Place NE/NE 124th Street	0.74	1.40	0.74	1.40	0.74	1.40	0.74	1.40

		No Action		Superblock		Off-Site		Unified Ownership	
ID	**Intersection**	**V/C**	**Threshold**	**V/C**	**Threshold**	**V/C**	**Threshold**	**V/C**	**Threshold**
314	Slater Avenue NE/NE 120th Street	1.06	1.40	1.15	1.40	1.15	1.40	1.15	1.40
315	Totem Lake Boulevard/NE 124th Street	1.31	1.40	1.34	1.40	1.34	1.40	1.34	1.40
316	Totem Lake Boulevard/NE 132nd Street	1.13	1.40	1.13	1.40	1.13	1.40	1.13	1.40
317	I-405 SB Off Ramp/NE 124th Street	0.72	1.40	0.74	1.40	0.74	1.40	0.74	1.40
318	I-405 NB Off Ramp/NE 124th Street	0.59	1.40	0.60	1.40	0.60	1.40	0.60	1.40
320	I-405 NB Off Ramp/NE 116th Street	0.89	1.40	0.90	1.40	0.90	1.40	0.90	1.40
325	128th Lane NE/NE 124th Street	0.79	1.40	0.81	1.40	0.81	1.40	0.81	1.40
	Northeast Subarea Average	0.92	0.99	0.94	0.99	0.94	0.99	0.94	0.99
	East Subarea								
401	132nd Avenue NE/NE 85th Street	1.11	1.40	1.13	1.40	1.13	1.40	1.13	1.40
402	124th Avenue NE/NE 85th Street	0.99	1.40	1.01	1.40	1.01	1.40	1.01	1.40
403	120th Avenue NE/NE 85th Street	1.02	1.40	1.04	1.40	1.04	1.40	1.04	1.40
404	124th Avenue NE/NE 100th Street	0.92	1.40	0.96	1.40	0.96	1.40	0.96	1.40
406	132nd Avenue NE/NE 70th Street	0.88	1.40	0.88	1.40	0.88	1.40	0.88	1.40
407	116th Avenue NE/NE 70th Street	1.10	1.40	1.15	1.40	1.15	1.40	1.15	1.40
408	124th Avenue NE/NE 90th Street	0.98	1.40	1.02	1.40	1.02	1.40	1.02	1.40
409	122nd Avenue NE/NE 85th Street	0.89	1.40	0.90	1.40	0.90	1.40	0.90	1.40
410	116th Avenue NE/I-405 NB Ramps	1.24	1.40	1.35	1.40	1.35	1.40	1.35	1.40
411	I-405 SB Ramps/NE 72nd Place	0.43	1.40	0.44	1.40	0.44	1.40	0.44	1.40
	East Subarea Average	0.96	1.10	0.99	1.10	0.99	1.10	0.99	1.10

Note: Shaded cells indicate locations where impacts were identified and mitigation proposed.
Source: Mirai and Associates 2008; Fehr & Peers 2010

Cost Estimates for Capacity Improvements

Table 3.3-19 summarizes planning-level cost estimates for the capacity improvement projects identified as mitigation measures.

Table 3.3-19. Estimated Costs of Proposed Capacity Improvements

No	Intersection	Potential Mitigation	Estimated Cost	No Action	Superblock	Off-Site	Unified Ownership
	2010-2014						
4	Central Way/ Parkplace Driveway	Install signal	$566,000[4]	X	X	X	X
7	Kirkland Way/Parkplace Driveway	Install signal and add an eastbound left turn lane. Provide protected/permitted left-turn phase for eastbound left turn.	$497,800[4]		X		X
105	Central Way/6th Street	Construct dual westbound left turn lane. Modify signal to provide westbound left/northbound right overlap phase	3,044,000[4]		X	X	X
109	NE 85th Street/ 114th Avenue NE	Restripe southbound dual left and eastbound right to through conversion. (CIP Project #TR-0079). HOV queue bypass for the eastbound-to-southbound on-ramp.	$166,400	X	X	X	X
		Add dual left-turn for westbound approach	536,200		X	X	X
110	6th Street/ 4th Avenue	Add an eastbound left turn lane and restripe the existing eastbound lane to a through-right lane. Change the signal to a split phase for eastbound and westbound approaches and coordinate signal timing with Central Way/6th Street.	$636,700				X

No	Intersection	Potential Mitigation	Estimated Cost	No Action	Superblock	Off-Site	Unified Ownership
111	Kirkland Avenue/3rd Street	Install a signal.	$535,300[4]		X	X	X
112	Kirkland Way/6th Street	Install signal. (CIP Project #TR-0065 - unfunded)[3]	564,000[4]		X	X	X
113	Kirkland Avenue/6th Street	Install a semi-actuated signal.	$821,100[4]		X	X	X
128	Central Way/ 5th Street	Install signal.	564,000[4]		X	X	X
129	Central Way/ 4th Street	Move crosswalk to Parkplace signal and extend two-way left turn lane.	$31,200[4]	X	X	X	X
		Add southbound left-turn lane. After crosswalk is moved, remove traffic calming device at the previous location and restore second eastbound through lane.	$14,500			X	
169	6th Street/7th Avenue	Add left turn lanes on northbound and southbound approaches	89,400[4]		X	X	X
179	Kirkland Way/Kirkland Avenue	Extend two-way left-turn (150 feet) from Parkplace signal (ID 7) and move crosswalk to Parkplace signal (ID 7)	$41,800[4]		X		X
211	Market Street/15th Avenue	Install signal. (CIP Project #TR20-11 - unfunded)	564,000[4]		X	X	X
402	NE 85th Street/ 124th Avenue NE	Add northbound right-turn-only pocket	889,000[4]		X	X	X
			TOTAL	$763,600	$8,941,400	$8,416,300	9,578,100
	2015-2022						
101	Lake Washington Boulevard/NE 38th Place[1]	Add 720 ft right lane on northbound receiving lanes (north of the Intersection), modified to extend up to NE 43rd St w/ bike lanes (CIP Project #TR-0090 – unfunded)	1,953,000	X	X	X	X

No	Intersection	Potential Mitigation	Estimated Cost	No Action	Superblock	Off-Site	Unified Ownership
109	NE 85th Street/ 114th Avenue NE	Add a dual left turn lane for southbound approach and restripe the southbound through lane to a through-right lane. Modify northbound and southbound split phases to provide protected phase for southbound left turn and permitted phase for northbound left turn.	$710,200	-	X	X	X
202	100th Avenue NE/ NE 124th Street	Modify the signal phase to be the same as during AM peak period. NB and SB to be split phase. The SB lane configuration change to left, left/through shared and through/right shared during the peak period.[5]	-	-	X	X	X
204	116th Way NE/ NE 132nd St[6]	Reconfigure the intersection based on the 132nd St Study and New I-405 SB off-ramp. (CIP Project #TR20-11 – unfunded)	WSDOT[2]	X	X	X	X
304	NE 132nd St/ 124th Ave NE[6]	Construct eastbound dual left turn based on the 132nd Street Study	4,438,100	X	X	X	X
316	Totem Lake Blvd/ NE 132nd St	Reconfigure the intersection based on the 132nd Street Study and new I-405 northbound on-ramp. CIP Project #TR20-11 – unfunded)	WSDOT[2]	X	X	X	X
			TOTAL	$6,391,100	$7,101,300	$7,101,300	$7,101,300

1. This estimate assumes that widening would allow the existing bicycle lane along the roadway to remain. If the improvement were made without keeping the bike lane, the estimated project cost would be $2,234,000
2. Assumed that improvement to this intersection would be included in the larger improvement that is planned by WSDOT for this location.
3. Projects funded in the CIP are partially funded by existing impact fees.
4. Impact fee eligible project.
5. No cost is assumed for this measure, since it is already being implemented during the AM peak period.
6. In the City of Kirkland Capital Facility Plan, improvement at these two locations are combined into one project, listed as NE 132nd Street.116th Way NE – Totem Lake Boulevard Intersection Improvements

Capacity improvements presented in Table 3.3-19 would be funded by a variety of sources. Only the improvements that would allow restriping of the intersection of 85th Street NE and 114th Avenue NE is included as a funded project in the current 6-year CIP. Funding for all other improvements could potentially include City funds, transportation grants, revision of the current citywide transportation impact fee, or developer improvements or contributions mandated by the PAO. All projects that are needed to meet TIA thresholds (as defined in Table 3.3-15) are impact fee eligible projects. Additional analysis and policy discussion would determine the amount of funds that would be derived from these sources. The City will consider use of a development agreement, as authorized by RCW 36.70B.170, or a similar mechanism, to ensure the provision and financing of necessary transportation improvements, and to impose appropriate development conditions.

These improvements would be incorporated into an amended Capital Facilities Plan Element and Transportation Element if the No Action, Superblock, Off-Site, or Unified Ownership alternatives are selected for implementation. See Chapter 2.

Potential Mitigation Measures

Transportation Demand Management

TDM programs seek to modify travel behavior and encourage economical alternatives to the SOV. Depending on the type of development proposed, development proposals could include TDM components to mitigate a portion of potential road capacity impacts through measures that would reduce vehicle demand. TDM typically includes incentives, programs, or regulations to reduce the number of SOV trips. TDM strategies try to influence behavior in a way that keeps expansion of the transportation system at a minimum. The higher the success of TDM strategies, the more successful the City will be at achieving the mode split goals of 65% SOV and 35% alternative modes.

TDM strategies may include: 1) working cooperatively with employers to implement programs that encourage employees not to drive alone; 2) requiring certain new developments to implement programs to reduce SOV use; 3) adjusting parking standards to meet existing demand and reducing them further when transportation options increase; and 4) supporting paid parking or other parking policy measures.

TDM programs are more challenging to implement if multiple developers are building in the project areas, compared to a single owner development or master plan. It is also more difficult for the City to monitor the effectiveness of TDM if multiple smaller programs are in place, compared to one integrated program. In order to have assurance that a TDM program is substantive enough to effectively reduce demand, the City would need to include program requirements as a condition of development. A TDM program may include, not be excluded to, some combination of the following:

- Provide a transportation coordinator to manage and promote the program. The hours, job description, and terms of employment need to be agreed upon by the City and the applicant.
- Provide transit pass subsidy. Require tenants to offer a subsidized transit pass, such as Metro's Flexpass, to all employees who commute by transit.
- Charge for daily parking. Validation programs may be offered for short-term visitors and customers.
- Offer a part-time parking pass option. Employees who desire to use alternative modes of transportation (or telecommute) one or more days per week would be offered a parking pass

that is only charged for the days parked. These types of passes work like a debit card, and the pass holder is only charged for parking on the days that they park. Fees could be structured to discourage multiple consecutive days of parking.

- Provide ride-match information. Encourage tenants to provide information to employees about ride-match programs that are available through King County Metro and other transit agencies. These programs can help match an employee with potential carpool mates who live in close proximity, if that person prefers carpool as a mode choice over other alternative modes.
- Provide free parking for vanpools. Vanpools registered with a public transit agency would be provided free on-site parking. At least six of the riders in each of vanpool must be employed in the area to qualify for free parking, and the free parking would only be provided for the van.
- Provide reserved parking spaces for vanpools. Parking in a preferred location in the garage would be reserved for registered vanpools.
- Provide shower and locker facilities. The complex would have at least one shower and locker facility (outside of the on-site fitness center and sized to adequately meet potential demand) for commuters who walk or bike to work.
- Provide bike storage. Bicycle corrals would be provided in the garage for employees who commute by bike. These would be in an easily-accessible location, would have good lighting and security, and would be sized to accommodate 110% of City code requirements for bicycle parking.
- Provide parking for a car-sharing program (e.g., Zipcar). Provide parking spaces for Zipcar or another car-sharing company to locate in the area. Car-sharing programs support employees who commute by alternative modes of travel by providing vehicles that can be used for daytime errands or meetings. Employer subsidies of car-sharing fees may be required to be provided by tenants.
- Offer guaranteed ride home to employees who commute by alternative modes. The developer would encourage employers to provide guaranteed rides home for commuters who use alternative forms of transportation but need to get home quickly in an emergency or after available transit service has stopped. The ride home can be by taxi, company-owned vehicle, or car-sharing vehicle. The number of rides available per month or year may be limited. This program reassures employees that they will have transportation during emergencies so they are more comfortable using transit or carpools.
- Install electronic kiosk(s) with travel information. Install at least one electronic kiosk that provides up-to-date information about transportation services. This could include transit route maps and stop times, commuter congestion, parking rates, and information about alternative modes of travel.
- Monitor success of the TDM program. A mode split target would be developed in cooperation with the City. The on-site transportation coordinator would conduct biennial surveys of area tenants and employees regarding the modes of travel used and the success of various programs. Results would be compiled and sent to the City. The survey questionnaire and reporting requirements will be approved by City staff before the first survey is taken. After its initial distribution, any proposed changes to the survey would be submitted for approval by the City.
- Join applicable transportation management association. Developer/owner agrees to become member of any applicable transportation management association that is formed in the future.

Parking Management

Parking management measures could be implemented to ensure that parking is shared among the various land uses and to prevent parking from being used by commuters to other businesses or the transit center. Mitigation could include the following measures:

- Charge for all daytime parking. All employees, visitors, and customers would be charged for parking except when validated (see following paragraph). The garage would use a "pay-on-foot" system through which parking could be paid for before exiting the garage gates. Payment kiosks would be located at garage elevators. Monthly and per-day parking passes could also be obtained by regular commuters with fee structures that would discourage multiple consecutive day parking.
- Validate customer and visitor parking. All tenants in an area could validate parking for their customers or visitors. Each business would establish its own validation requirements (e.g., minimum purchase). Validation would be done electronically through the pay-on-foot technology.
- Provide a segmented garage. (Only feasible for a large site such as the Superblock site). Using internal gates and controls, divide the garage into sections that are reserved for specific uses at different times of the day.
- Reserve areas of the garage for short-term parking by customers and visitors. Designate some parking spaces for short-term parking only. This parking would be for customers and visitors. The short-term parking restrictions could apply during just midday weekday hours when office users are on site.
- Share office parking on weeknights and weekends. Make all parking in the garage available for customers on weeknights and weekends.
- Do not reserve individual spaces for office parking. No parking space in the garage would be reserved for an individual user. This allows all office parking to be shared by employees.
- Monitor garage use. Monitor the allocation of the parking supply to various users during weekday hours. Adjust allocation or implement additional management measures, if needed.
- Monitor public parking in the downtown area. The City may require a parking management program be implemented as a condition of development approval, with specific measures defined in the case that tenants do not meet parking demand targets. For example, if a developer/owner is not meeting required targets and is creating an off-site impact, the developer or owner will either improve its own compliance or pay costs associated with implementing an off-site parking management program.

Like TDM programs, parking management programs are more challenging to implement and monitor if multiple developers are building in the project areas, compared to a single owner development or master plan. Some elements listed above are only practical if one integrated parking plan is developed and parking is provided in one garage.

Permitted Parking in Neighborhoods

If, over the long-term, monitoring indicates that even with the parking management measure described above in place, that parking supply is not adequate to meet typical demand, and overflow traffic is parking in neighborhoods, the City may consider establishing a permit program for parking

in neighborhoods. This would allow residents to park long-term in their neighborhoods at no charge, but would restrict visitors to an established maximum (2 to 4 hours is typical).

Construction Mitigation Measures

Construction mitigation may include the following measures tied to a permit application.

- Provide on-site or nearby parking for construction workers.
- Restrict major removal and delivery of materials to and from the site to the Central Avenue corridor east of 6th Street.
- Provide flaggers to direct traffic when appropriate.
- Provide on-site loading areas for removal and delivery of materials.
- Prohibit truck movements to the site during the PM traffic peak hours.
- Provide temporary sidewalks when existing sidewalks are blocked.
- Adjust traffic signal phasing and timing to reduce traffic congestion.

Measures to Reduce Greenhouse Gas Emissions

In addition to trip reduction measures such as transit, carpooling, and walking, there are several other ways that future developers in the analysis area could reduce GHG emissions. The 2008 EIS lists a variety of additional mitigation measures that could reduce GHG emissions caused by building construction, space heating, and vehicle usage. These could also apply to the Superblock and Off-site Alternatives.

Policy and Land Use Measures

In the case that revenue is not available to address all identified capacity needs, or if TDM measures do not produce adequate reduction to reduce needed capacity improvements, the GMA allows the City to achieve the needed balance between land use and the transportation system through policy or land use measures. Land use measures may include reducing the level of development at certain locations to reduce the number of trips in the transportation system. Policy measures can include refining LOS and concurrency standards to allow more congestion at certain locations.

3.3.4 Significant Unavoidable Adverse Impacts

Implementation of the No Action Alternative, Superblock Alternative, Off-Site Alternative, or Unified Ownership Alternative would result in increased traffic volumes and congestion in the City. Although the effects of additional vehicles on traffic congestion can be mitigated to varying degrees through the proposed transportation improvements, the actual increase in traffic volume may be considered a significant unavoidable adverse impact. A significant adverse impact could also result if one or more mitigation measures that have been identified to address expected impacts are not implemented. The combination of recommended roadway improvements that the City selects will reflect a balance between desired improvement in traffic operations, policy decisions, and available revenue.