3.4 TRANSPORTATION

3.4.1 Affected Environment

This section describes the existing transportation system in the vicinity of the project site, including roadway characteristics, traffic volumes, traffic operations, safety conditions, transit, non-motorized facilities, and parking. It also describes future transportation conditions that are expected, regardless of whether or not the redevelopment occurs.

Study Area and Analysis Periods

The transportation study area was coordinated with City of Kirkland Public Works Department staff, and is based on the City's adopted *Transportation Impact Analysis Guidelines*.[1] It includes the site access driveway, intersections near the project site, and significant intersections through which project-generated daily vehicle trips are expected to comprise at least 1% of the intersection capacity. This is determined using established City procedures in which Proportional Share Impact Worksheets are completed. The project study area includes the following intersections, shown on Figure 3.4-1 (traffic control at each is also listed):

1. Lake Street S/Site Access Driveway – unsignalized; westbound stop-controlled
2. Lake Street S/10th Avenue S – unsignalized; eastbound and westbound stop-controlled
3. State Street S/10th Avenue S – unsignalized; eastbound stop-controlled
4. State Street S/NE 68th Street – signalized
5. 6th Street S/108th Avenue NE/NE 68th Street – signalized
6. NE 72nd Place/Interstate-405 (I-405) Southbound Ramps – signalized
7. 116th Avenue NE/NE 70th Place – signalized
8. 116th Avenue NE/I-405 Northbound Ramps – signalized
9. Lake Washington Boulevard/Lakeview Drive – signalized
10. Lake Washington Boulevard/NE 38th Street – signalized

Roadway operational analysis is provided for the weekday AM and PM peak periods, which are the times that traffic volumes are highest. Peak weekend conditions adjacent to the project site are also assessed. Consistent with the City's *Transportation Impact Analysis Guidelines*, future conditions are evaluated for 2014, which is the year the proposed project would be complete and occupied.

[1] City of Kirkland, Transportation Impact Analysis Guidelines, February 2004.

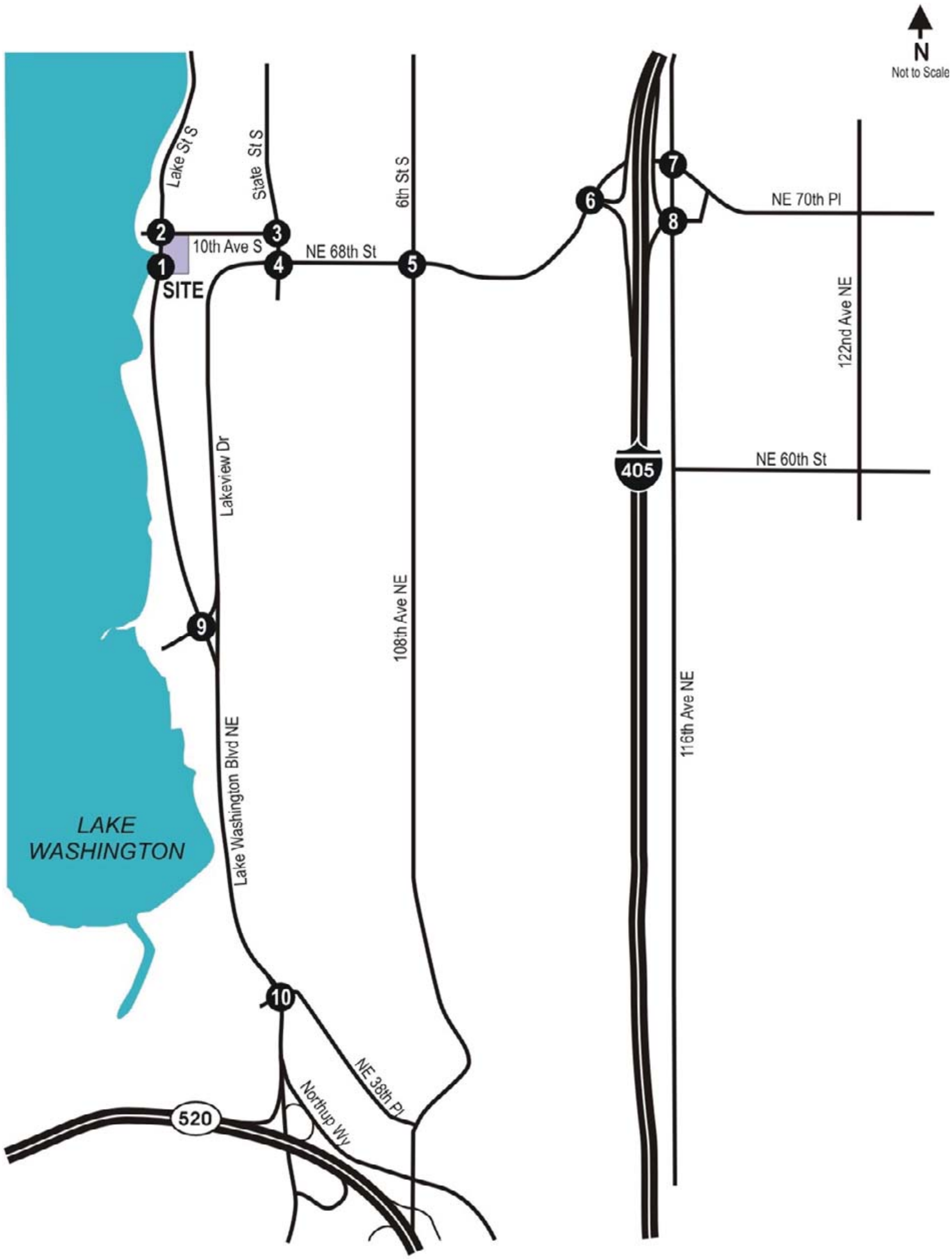

FIGURE 3.4-1

TRANSPORTATION STUDY AREA

Roadway System

Regional access is provided to the project site via Interstate-405 (I-405) and State Route 520 (SR 520). I-405 is north-south freeway that connects destinations on the east side of Lake Washington, including Lynnwood, Bothell, Woodinville, Kirkland, Bellevue, Renton, and Tukwila. I-405 provides connection to I-90, and connects to I-5 at both its north and south ends. The interchange nearest the project site is located at NE 70th Place and 116th Avenue NE, about one mile to the east. SR 520 is an east-west freeway that connects Seattle, Kirkland, Bellevue and Redmond. The interchange nearest the project site is located at Lake Washington Boulevard, about one and a half miles to the south.

The City designates streets as principal arterials, minor arterials, collector arterials, and local access streets, depending on the street's function in the roadway network. Table 3.4-1 summarizes the functional classifications, speed limits, number of lanes, non-motorized characteristics, and parking characteristics of the study area streets.

Table 3.4-1 Existing Roadway Characteristics

Roadway	*Functional Classification*	*Speed Limit (mph)*	*Travel Lanes*	*Non-Motorized and Parking Characteristics*
Lake Street S / Lake Washington Blvd	Principal Arterial	30-35 [1]	2-3 [1]	Sidewalk, bicycle lane, and parking lane on both sides.
State Street S	Minor Arterial	30	2-3	Sidewalk, bicycle lane, and parking lane on both sides.
Lakeview Drive	Minor Arterial	25	2	Sidewalk and bicycle lane on both sides; parking lane on east side, north of NE 66th Ln.
6th Street S / 108th Avenue NE	Minor Arterial	30	2-3	Sidewalk and bicycle lane on both sides; north of NE 68th St, parking lane on both sides.
116th Avenue NE	Collector	25-35	2-5	Bicycle lane on both sides; north of NE 70th Pl, no sidewalks and parking lane intermittent; south of NE 70th Pl, sidewalk on east side and no parking.
10th Avenue S	Local Access	15-25	2	Sidewalk and parking lane on both sides. Three speed humps between Lake and State Streets have 15 mph speed limit signs.
NE 68th Street	Minor Arterial	25	2-3	Sidewalk on both sides; bicycle lane on south side, bicycle lane or sharrow on north side; no parking.
NE 72nd Place / NE 70th Place	Minor Arterial	30	3-4	Sidewalk on north side.
NE 38th Place	Collector	25	3	Sidewalk and bicycle lanes on both sides.

Source: City of Kirkland Comprehensive Plan, Transportation Element, January 2010
1. Adjacent to the project site, Lake Street S has two travel lanes and a speed limit of 30 mph.

Analysis presented in this DEIS reflects the recently completed improvement to 6th Street S/108th Avenue NE/NE 68th Street, which included the addition of a westbound-to-northbound right-turn lane. The *2011-2016 Capital Improvement Program* (CIP)[2] was reviewed to determine if any roadway capacity improvements are funded and planned to be complete by the future analysis year of 2014. The current CIP does not include any funded projects in the study area. Though not yet adopted, the preliminary 2013-2018 CIP was also reviewed; it also does not include any funded projects in the study area.

Traffic Volumes

Existing Traffic Volumes

Hourly traffic data were collected by All Traffic Data Services, Inc., a professional traffic data collection firm, for seven days beginning May 12, 2012, on Lake Street S south of 10th Avenue S, adjacent to the project site. The hourly data were compiled to confirm the days and times in which the peak traffic periods occur. The Saturday and Sunday data were collected on May 12 and 13, 2012. The weather on both days was sunny with high temperatures in the mid-70s. Sunday of this weekend was Mother's Day, during which a higher-than-normal level of activity at downtown and lakefront restaurants would be expected. Therefore, conditions on these days reflected those in which higher levels of activity and higher than typical traffic volumes in the study area would be expected.

Figures 3.4-2 shows the hourly volumes for a typical weekday. The data indicate that the highest traffic volume on Lake Street S occurred during the weekday AM peak hour, between approximately 8:00 and 9:00 A.M. The two-directional volume during this time exceeded 1,100 vehicles, with almost 80% (about 900 vehicles) traveling in the southbound direction. The two-way volumes decreased to about 700 vehicles per hour between 10:00 and 11:00 A.M., but then increased steadily until the PM peak hour, which occurred between about 4:00 and 5:00 P.M. During weekday PM peak hour, two way volumes were around 1,000 vehicles. During the PM peak hour, the northbound volume was higher than the southbound volume, but the two directions were more balanced than they were during the AM peak hour, with about 60% traveling northbound and 40% traveling southbound.

Figures 3.4-3 and 3.4-4 show the hourly volumes for a Saturday and Sunday, respectively. As shown, the northbound and southbound traffic flows were relatively balanced throughout both weekend days. The two-way total volumes were similar in magnitude to the weekday PM peak hour, but were sustained over a longer period of time. On Saturday, two-way volumes between 900 and 1,000 vehicles per hour occurred from about noon until 7:00 P.M. On Sunday, peak two-way volumes (between 900 and 1,000 vehicles per hour) occurred between about 1:00 and 3:00 P.M., and remained above 800 vehicles per hour from about 11:00 A.M. to 8:00 P.M.

[2] City of Kirkland, 2011-2016 Capital Improvement Program – Summary, approved under Resolution R-4855, December 7, 2010.

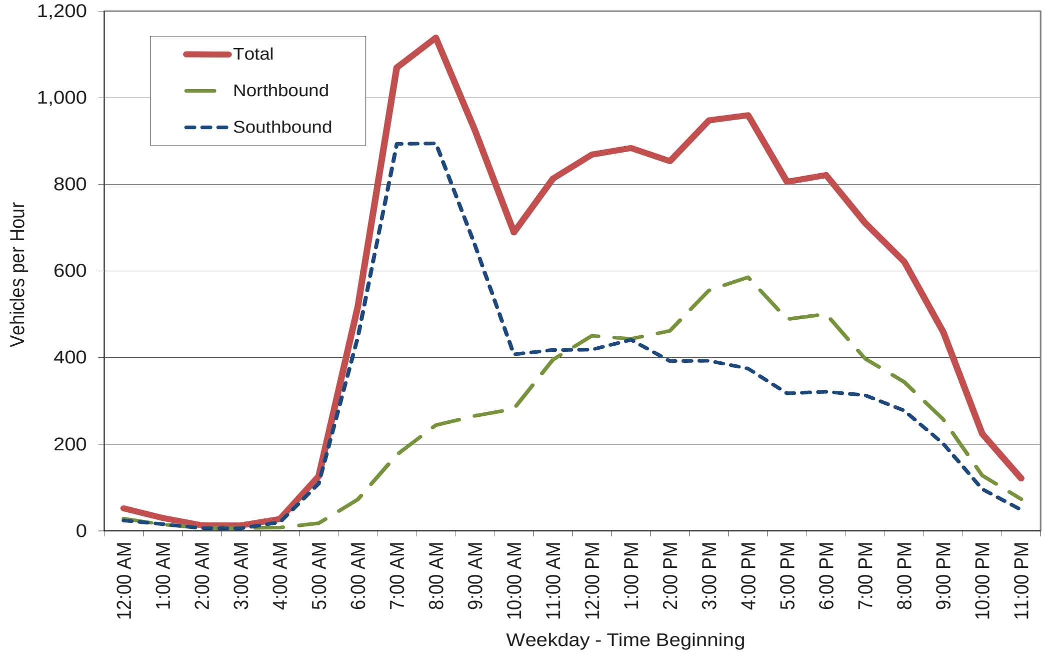

FIGURE 3.4-2

HOURLY TRAFFIC VOLUMES ON LAKE STREET S, SOUTH OF 10TH AVE S - WEEKDAY

Source: Seven day machine counts performed by All Traffic Data Services, Inc., beginning May 12, 2012

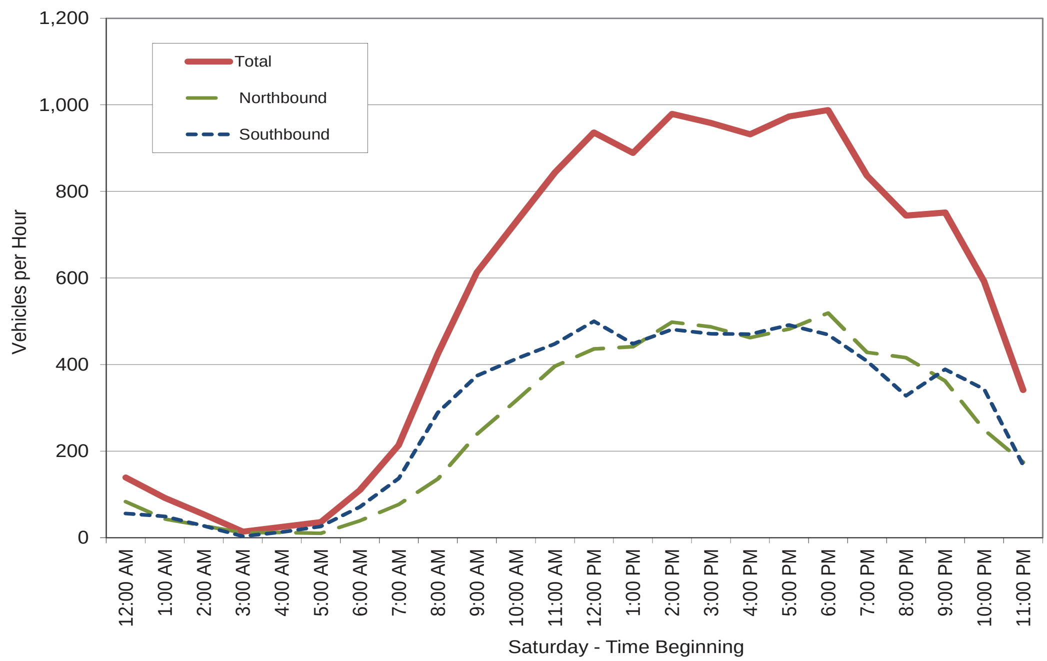

FIGURE 3.4-3

HOURLY TRAFFIC VOLUMES ON LAKE STREET S, SOUTH OF 10TH AVE S - SATURDAY

Source: Seven day machine counts performed by All Traffic Data Services, Inc., beginning May 12, 2012

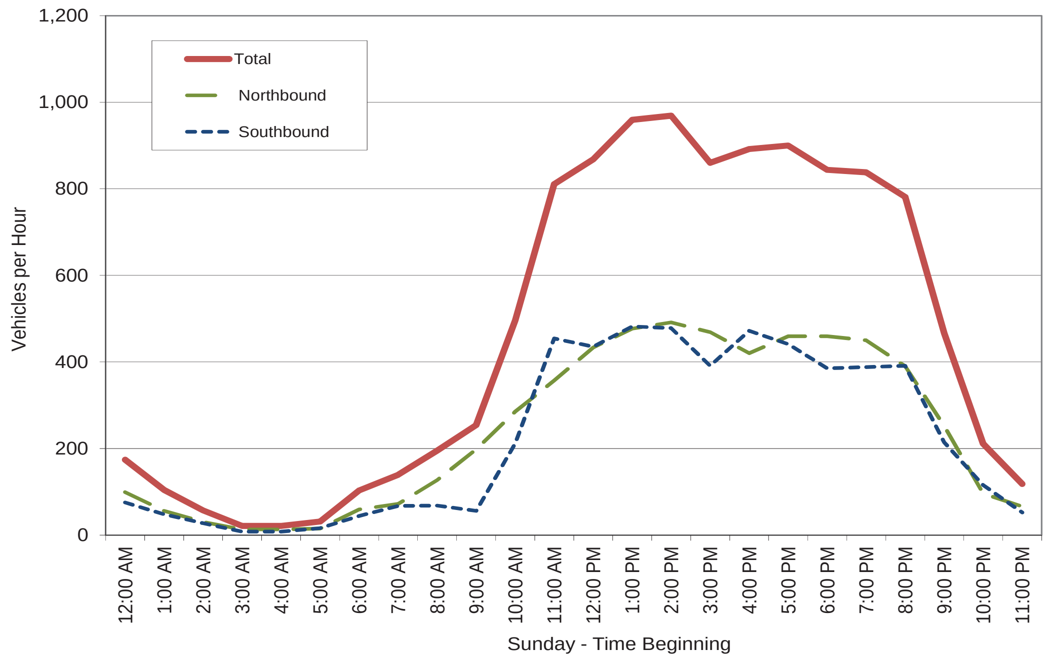

FIGURE 3.4-4

HOURLY TRAFFIC VOLUMES ON LAKE STREET S, SOUTH OF 10TH AVE S - SUNDAY

Source: Seven day machine counts performed by All Traffic Data Services, Inc., beginning May 12, 2012

Existing weekday intersection traffic volumes were obtained from peak period turning movement counts conducted at the study area intersections. For the AM peak hour, All Traffic Data Services, Inc. conducted turning movement counts at all of the study area intersections on May 9, 2012. A weekday PM peak period traffic count was also conducted at Lake Street S/10th Avenue S on the same day. Existing weekday PM peak period volumes at the other study area intersections were projected based on traffic counts conducted in December 2010 by another professional traffic data collection firm, Quality Counts. To reflect existing 2012 PM peak hour conditions, the 2010 counts were increased by an average annual growth rate of 2% per year. This assumed growth rate was provided by City of Kirkland Public Works Department staff. Traffic trends over the past few years have reflected about 1% growth citywide, so 2% per year is considered a conservatively high average annual growth estimate.[3] In addition, the new traffic count at Lake Street S/10th Avenue S indicated a higher northbound right-turn movement to 10th Avenue S than was observed in 2010. The count indicated an increase in the northbound right-turn movement of about 30 vehicles during the PM peak hour, and it is assumed that these additional vehicles are traveling eastbound on 10th Avenue S and then continuing north on State Street S; therefore, the eastbound left-turn movement at State Street S/10th Avenue S was also adjusted to reflect this volume increase. Existing (2012) intersection volumes for the AM and PM peak hours are shown on Figures 3.4-5 and 3.4-6, respectively.

[3] Future traffic growth assumptions and historical citywide traffic growth trends provided by Thang Nguyen, City of Kirkland Traffic Engineer, May 2012.

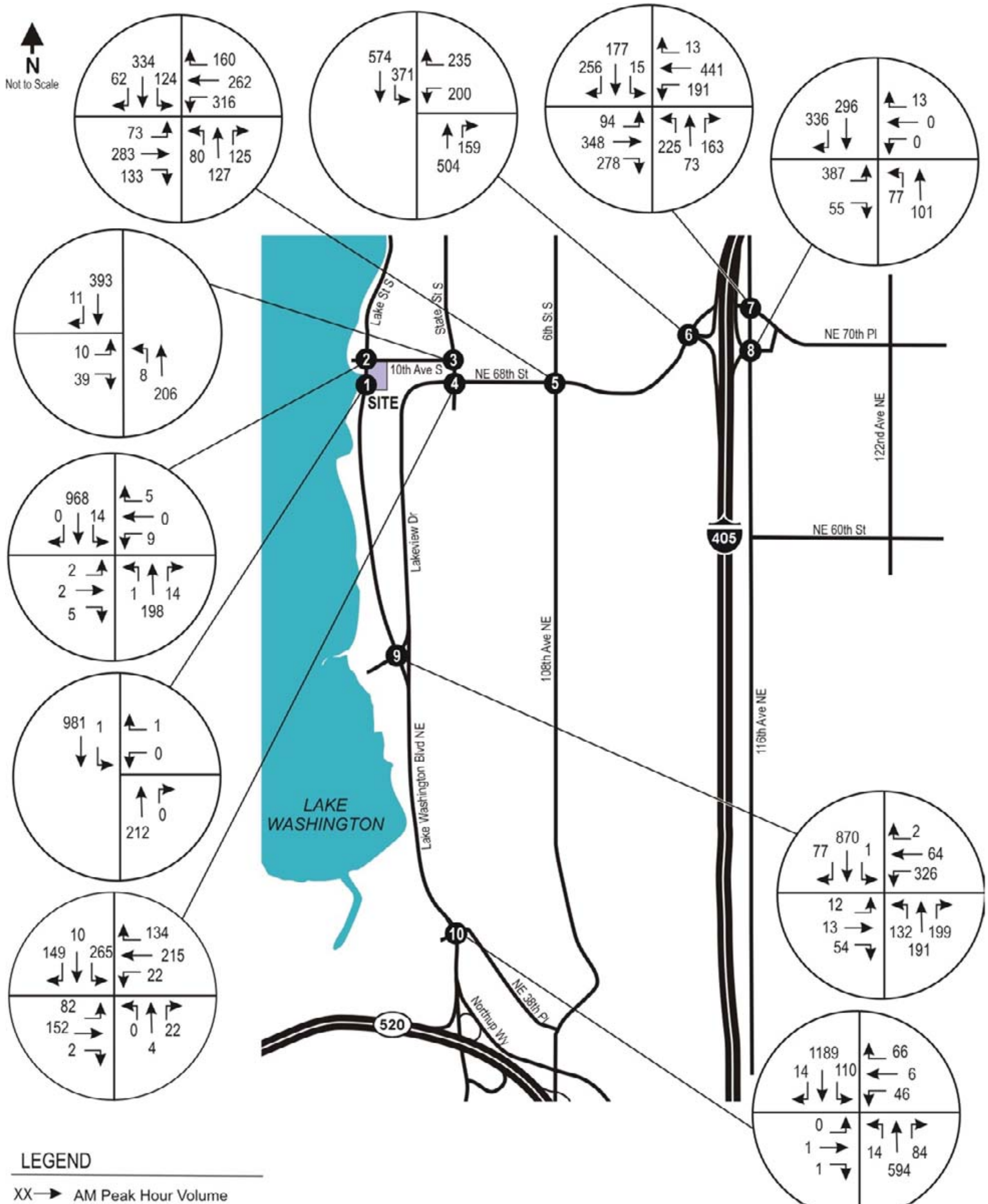

FIGURE 3.4-5

EXISTING (2012) TRAFFIC VOLUMES – AM PEAK HOUR

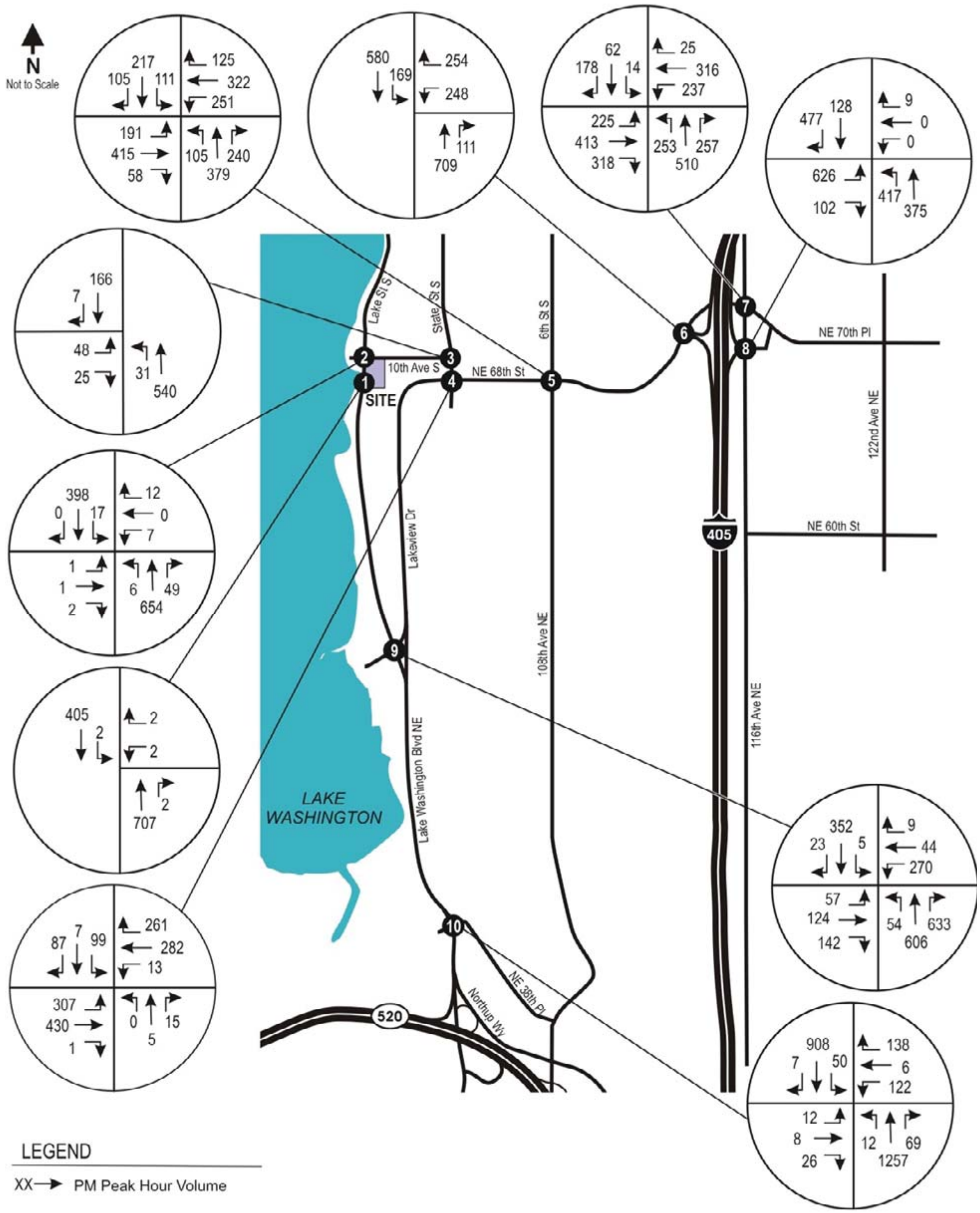

FIGURE 3.4-6

EXISTING (2012) TRAFFIC VOLUMES – PM PEAK HOUR

Existing weekend peak hour traffic volumes on Lake Street S were obtained from the machine counts conducted on Saturday, May 12 and Sunday, May 13, 2012 adjacent to the project site. The count data indicated that the Saturday peak hour occurred from 5:30 to 6:30 P.M., with 482 vehicles traveling northbound and 525 vehicles traveling southbound (1,007 vehicles total). The data indicated that the Sunday peak hour occurred from 1:45 to 2:45 P.M., with 510 vehicles traveling northbound and 493 vehicles traveling southbound (1,003 vehicles total). The two-way total volumes that occurred during the Saturday and Sunday peak hours were 10% to 15% lower than the two-way totals that occurred during the weekday AM and PM peak hours.

Future Volumes without Project

Future "without project" volumes reflect the expected traffic growth that is expected to result from new regional development, regardless of whether or not the proposed project occurs. Future-without-project volumes were projected for the analysis year of 2014. In addition to overall regional growth, vehicle trips expected to result from specific future development projects in Kirkland that have been permitted but are not yet completed (referred to as pipeline projects) were added to estimate the 2014-without-project volumes.[4] Projected additional traffic volumes resulting from the following pipeline projects are expected to travel through the study area intersections by 2014, and therefore were included in the future-without-project volumes:

- **Yarrow Bay** – an expansion of the existing Yarrow Bay office complex located at Lake Washington Boulevard and Northup Way/Point Drive NE.
- **TOD Transit** – an expansion of the South Kirkland Park & Ride located at the northwest corner of NE 38th Place and 108th Avenue NE, including new mixed use development.
- **Northstar Junior High** – a relocation of the existing Northstar Junior High from the Lake Washington High School campus to BEST High School, located at NE 53rd Street and 108th Avenue NE.
- **McCleod Development** – a mixed-use redevelopment located on Lake Street S between Kirkland Avenue and 2nd Avenue S.
- **Parkplace** – a mixed-use office and retail development located at Central Avenue and 6th Street in downtown Kirkland

To estimate 2014-without-project volumes for the weekday AM peak hour, the City recommended average annual growth rate of 2% per year was applied to the existing (2012) AM peak hour volumes; then, the projected additional trips from the five pipeline projects were added to those volumes. To estimate 2014-without-project volumes for the weekday PM peak hour, the 2% average annual growth rate was applied to the City's 2010 PM peak hour model volumes, rather than the existing (2012) volumes. Use of the City's PM peak hour model volumes is consistent with the approach the City uses to test whether or not a project meets concurrency (described later in this section). Because the City model volumes reflect 2010 conditions, the 2% average annual growth rate was applied over four years to estimate 2014 conditions, and the pipeline project trips were then added to those volumes. The City's model was developed prior to the economic recession, and model volumes are higher than the volumes reflected in the 2010 PM peak hour traffic counts. According to City transportation staff, with the economic recession, the City has experienced traffic growth of about 1% on average. The City's concurrency PM peak hour traffic forecasts are based on a growth rate of 1% annually. Therefore, future projections based on the

[4] Pipeline project information provided by Thang Ngyuen, City of Kirkland Traffic Engineers, May and June, 2012.

model volumes and a 2% annual growth rate provide a conservatively high basis for the traffic analyses. Projected 2014-without-project intersection volumes for the AM and PM peak hours are shown on Figures 3.4-7 and 3.4-8, respectively.

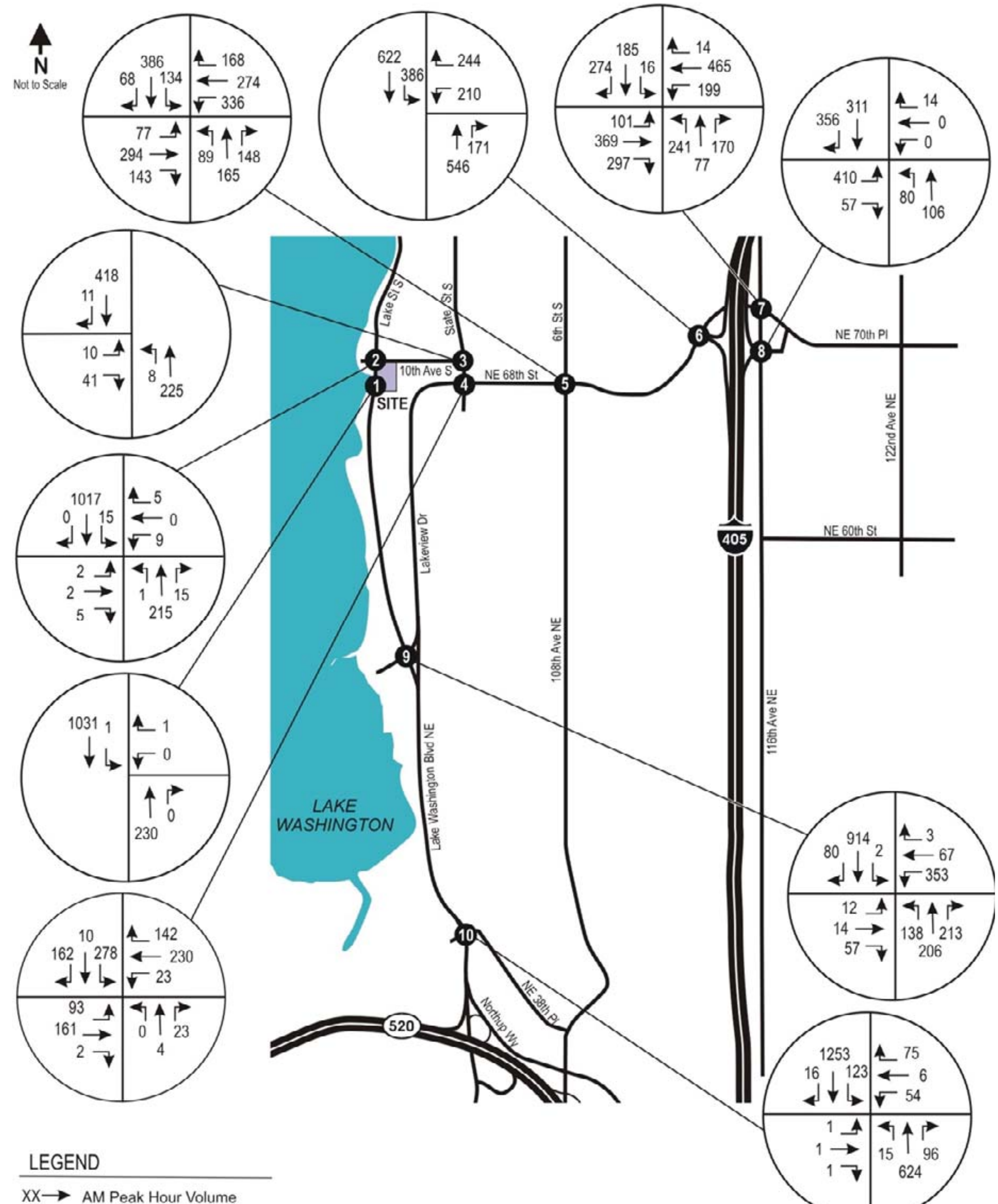

FIGURE 3.4-7

2014 WITHOUT PROJECT TRAFFIC VOLUMES– AM PEAK HOUR

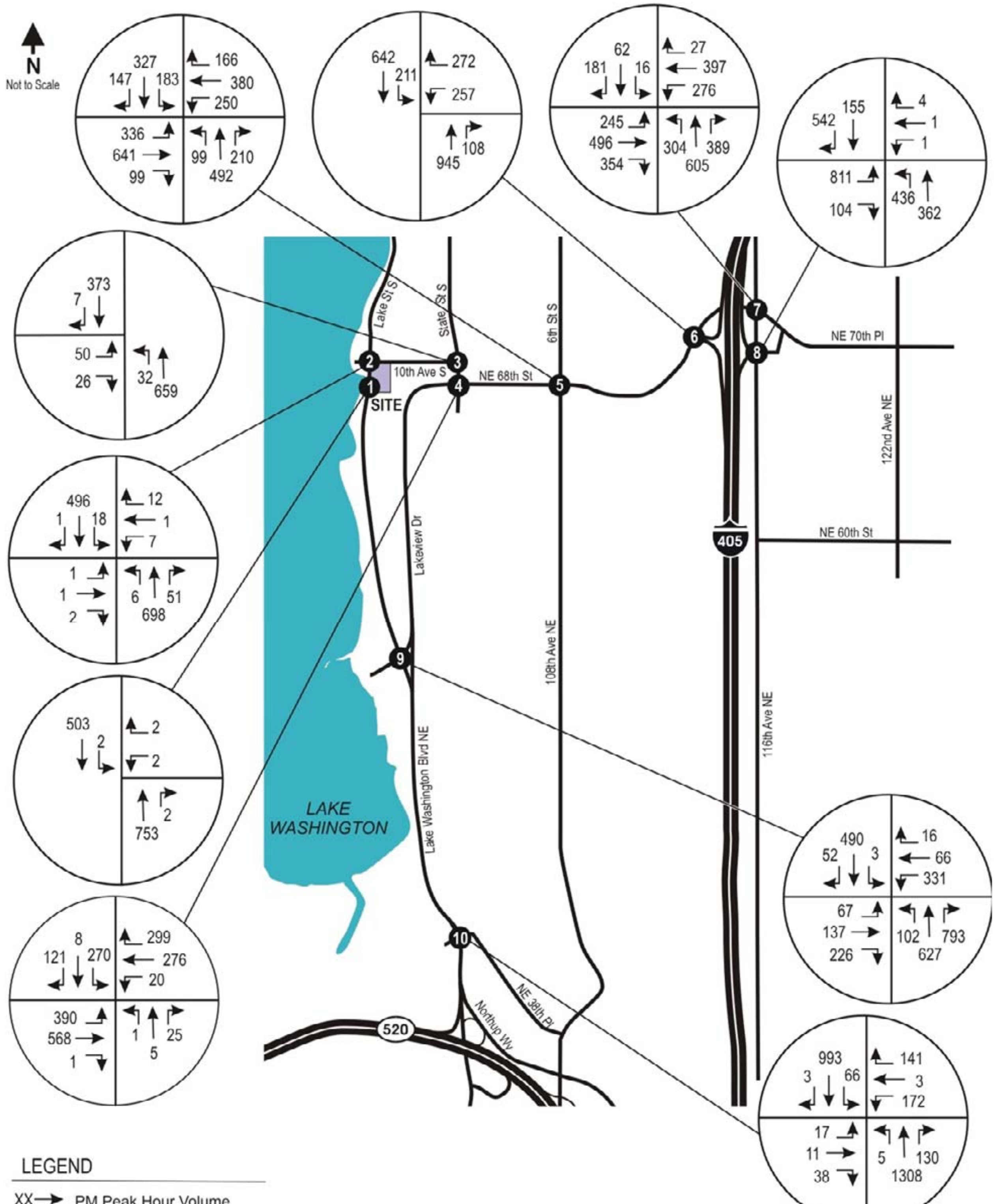

FIGURE 3.4-8

2014 WITHOUT PROJECT TRAFFIC VOLUMES– PM PEAK HOUR

To estimate 2014-without-project volumes during the weekend peak hours on Lake Street S, the average annual growth rate of 2% per year was applied to the existing (2012) peak hour volumes. To account for potential additional weekend trips generated by the pipeline projects, the existing volumes were then increased by an additional 5%. Since the junior high school and office components of the pipeline projects would not typically generate weekend trips, this adjustment provides a conservatively high estimate for future weekend peak hour traffic. The resulting projected 2014-without-project volumes on Lake Street S are 525 northbound vehicles and 570 southbound vehicles (1,095 vehicles total) during the Saturday peak hour, and 560 northbound vehicles and 540 southbound vehicles (1,100 vehicles total) during the Sunday peak hour.

Level of Service

Level of service (LOS) analysis was performed at the study area intersections for the AM and PM peak hours. Level of service is a qualitative measure used to characterize traffic operating conditions. Six letter designations, "A" through "F," are used to define level of service. 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.

Levels of service for the study area intersections were analyzed using methodologies presented in the Highway Capacity Manual (HCM).[5] All level of service calculations were performed with Trafficware's *Synchro 8.0* analysis software. Intersection analysis was completed using the Synchro calculation module, which refines Highway Capacity Manual methods. Results for unsignalized intersections were reported using the *HCM Unsignalized* module.

Level of service for intersections is defined in terms of delay. Specifically, level of service criteria are stated in terms of the average delay per vehicle in seconds. For a signalized intersection, level of service is based upon average delay for all vehicles traveling through the intersection. The level of service for a two-way, stop-controlled intersection is determined by the average delay for each minor (stop-controlled) movement. Delay is related to the availability of gaps in the main street's traffic flow, and the ability of a driver to enter or pass through those gaps. Table 3.4-2 shows the level of service criteria for signalized and unsignalized intersections, as defined in the *Highway Capacity Manual*. Stop-controlled intersections have different level of service threshold values than 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. Therefore, for the same LOS, a smaller amount of delay is acceptable at stop-controlled intersections than for signalized intersections.

[5] Transportation Research Board. 2010. Highway Capacity Manual. Special Report 209. Washington, DC.

Table 3.4-2 Level of Service Criteria

Level of Service	Average Delay Per Vehicle		General Description
	Signalized	*Unsignalized*	
A	≤ 10.0 seconds	≤ 10.0 seconds	Free flow
B	10.1 – 20.0 seconds	10.1 – 15.0 seconds	Stable flow (slight delays)
C	20.1 – 35.0 seconds	15.1 – 25.0 seconds	Stable flow (acceptable delays)
D	35.1 – 55.0 seconds	25.1 – 35.0 seconds	Approaching unstable flow (tolerable delay)
E	55.1 – 80.0 seconds	35.1 – 50.0 seconds	Unstable flow (approaching intolerable delay)
F	> 80.0 seconds	> 50.0 seconds	Forced flow (jammed)

Source: Transportation Research Board, Highway Capacity Manual, 2010

Table 3.4-3 shows the thresholds that the City of Kirkland has adopted to determine the significance of level of service impacts under SEPA.[6] For with-project conditions in the future analysis year, if an intersection's expected level of service exceeds the threshold during the peak hour (worst case conditions), the level of service impact is determined to be significant and mitigation is required. As shown, for an intersection expected to operate at LOS D or better with project-generated trips, the impact of the project trips is not considered significant and no mitigation is required. For an intersection expected to operate at LOS E, if the project's daily traffic through the intersection exceeds 15% of the intersection's capacity, the impact is considered significant and mitigation is required. For an intersection expected to operate at LOS F, if the project's daily traffic through the intersection exceed 5% of the intersection's capacity, the impact is considered significant and mitigation is required.

Table 3.4-3 Intersection Level of Service Impact Criteria

Peak Hour Intersection Level of Service with Project [1]	Impact Threshold
LOS A – LOS D	No mitigation needed.
LOS E	Mitigation needed if the project's Proportional Share exceeds 15% of the intersection capacity.
LOS F	Mitigation needed if the project's Proportional Share exceeds 5% of the intersection capacity.

Source: City of Kirkland, Transportation Impact Analysis Guidelines, February 2004
1. For signalized intersection, the threshold is applied to the intersection average. For stop-controlled intersections, the threshold is applied to the stop-controlled movement(s).

Table 3.4-4 summarizes level of service for existing (2012) and future 2014-without-project conditions. As shown, all study area intersections are operating at LOS D or better during both AM and PM peak hours under existing conditions. With projected background traffic growth, three study area intersections are projected to operate at LOS E during the PM peak hour in 2014, and one is projected to operate at LOS F. The added delay and LOS degradation at some locations is due to the background citywide traffic growth projected in the City's travel demand model, as all four intersections are currently operating at LOS C or D during the PM peak hour.

[6] City of Kirkland, Transportation Impact Analysis Guidelines, February 2004.

Table 3.4-4 Existing and 2014-Without-Project Levels of Service – AM and PM Peak Hours

	Existing (2012) Conditions				Future (2014) Without Project			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS[1]	*Delay*[2]	*LOS*	*Delay*	*LOS*	*Delay*	*LOS*	*Delay*
Unsignalized Intersections [3]								
1. Lake Street S/ Site Driveway								
Westbound movement	A	9.5	C	19.0	A	9.7	C	21.7
Northbound movement	A	0.0	A	0.0	A	0.0	A	0.0
Southbound movement	A	0.0	A	0.1	A	0.0	A	0.1
2. Lake Street S/ 10th Avenue S								
Eastbound movement	D	26.8	D	25.3	D	29.3	D	31.1
Westbound movement	D	28.7	C	22.3	D	32.1	D	27.8
Northbound movement	A	0.1	A	0.2	A	0.1	A	0.2
Southbound movement	A	0.3	A	0.7	A	0.4	A	0.7
3. State Street S/ 10th Avenue S								
Eastbound movement	B	12.9	C	18.0	B	13.3	D	34.6
Northbound movement	A	0.4	A	0.7	A	0.4	A	0.9
Southbound movement	A	0.0	A	0.0	A	0.0	A	0.0
Signalized Intersections [4]								
4. State Street S/ NE 68th Street	B	17.8	C	20.5	B	18.2	C	27.7
5. 6th Street S/ 108th Avenue NE/ NE 68th Street	D	35.9	D	40.7	D	43.7	**E**	**67.5**
6. NE 72nd Place/ I-405 Southbound Ramps	C	28.0	C	29.4	C	32.9	**E**	**57.1**
7. 116th Avenue NE/ NE 70th Place	C	21.5	C	26.5	C	24.6	C	32.3
8. 116th Avenue NE/ I-405 Northbound Ramps	B	17.6	D	47.1	B	18.4	**F**	**85.9**
9. Lake Washington Blvd / Lakeview Drive	D	42.6	B	18.8	D	43.9	C	21.9
10. Lake Washington Blvd / NE 38th Place	B	12.3	D	46.0	B	13.3	**E**	**64.5**

Source: Heffron Transportation, 2012
1. Level of Service.
2. Average seconds of delay per vehicle.
3. For unsignalized intersections, level of service is based upon the average delay for the stop-controlled and permitted left-turn movements, because they experience the highest delay.
4. For signalized intersections, level of service is based upon average delay for all intersection movements.
5. LOS E and LOS F intersection levels of service and average delay are highlighted.

Table 3.4-5 shows existing and 2014-without-project levels of service at the Lake Street S/Site Driveway intersection during the Saturday and Sunday peak hours. The weekend peak hour level of service was calculated to determine how weekend conditions compare to the weekday peak hours. For both existing and 2014-without-project conditions, both weekend peak hours experience levels of service in the westbound (stop-controlled) direction that are worse than the weekday AM peak hour level of service, but better than the weekday PM peak hour level of service. This analysis confirms that the weekday PM peak hour reflects the worst-case condition for existing and 2014-without-project conditions.

Table 3.4-5 Existing and 2014-Without-Project Levels of Service at Project Site – Weekend

	Existing (2012) Conditions				Future (2014) Without Project			
	Saturday Peak Hour		Sunday Peak Hour		Saturday Peak Hour		Sunday Peak Hour	
	LOS[1]	*Delay*[2]	*LOS*	*Delay*	*LOS*	*Delay*	*LOS*	*Delay*
Unsignalized Intersection [3]								
1. Lake Street S/ Site Driveway								
Westbound movement	C	15.4	C	16.9	C	16.5	C	18.5
Northbound movement	A	0.0	A	0.0	A	0.0	A	0.0
Southbound movement	A	0.1	A	0.0	A	0.1	A	0.0

Source: Heffron Transportation, 2012

1. Level of Service.

2. Average seconds of delay per vehicle.

3. For unsignalized intersections, level of service is based upon the average delay for the stop-controlled and permitted left-turn movements, because they experience the highest delay.

Collision History

The most recent years of reported collision data were obtained from the City of Kirkland for the intersections and roadway segments in the study area. These data were examined to determine if there are any unusual traffic safety conditions that could impact or be impacted by the proposed project. The data cover the period from January 1, 2009 through August 31, 2011 and are summarized in Table 3.4-6. For intersections and roadway segments that are not listed in the table, no collisions were reported during the study period.

As shown, collision rates ranged from 0.7 to 2.6 collisions per year at the locations where they were reported. No collisions were reported at the study area intersections that are not listed in the table. Of the collision types recorded as "other," all except one involved collision of a vehicle with a parked car or other fixed object. None of the collisions resulted in fatalities. In Kirkland, the citywide averages are 6 collisions per year at signalized intersections, and 3 collisions per year at unsignalized intersections.[7] The collisions recorded in the study area are lower than citywide averages, and there are no recorded collision patterns that suggest roadway deficiencies or unusual safety conditions.

[7] Citywide average collision rates provided by Thang Ngyuen, City of Kirkland Traffic Engineers, June 2012.

Table 3.4-6 Collision History in Study Area – 2009-2011

Intersection	Head-On	Rear-End	Side-Swipe	Right Turn	Left Turn	Right Angle	Ped/ Cycle	Other	Total for 2.7 Years	Avg/ Year
6th St S/108th Ave NE/NE 68th St	0	1	3	0	0	0	2	1	7	2.6
NE 72nd Place/I-405 SB Ramps	0	0	0	0	2	0	0	0	2	0.7
116th Ave NE/NE 70th Place	0	3	0	1	0	1	0	1	6	2.2
Lk Washington Blvd/Lakeview Dr	0	3	1	0	0	2	1	0	7	2.6
Lk Washington Blvd/NE 38th Pl	0	1	2	0	1	0	2	0	6	2.2
Roadway Segment	**Head-On**	**Rear-End**	**Side-Swipe**	**Right Turn**	**Left Turn**	**Right Angle**	**Ped/ Cycle**	**Other**	**Total for 2.7 Years**	**Avg/ Year**
Lk Washington Blvd, NE 38th Pl to Lakeview Drive	0	2	0	0	0	0	0	3	5	1.9
NE 68th Street, 106th Ave NE to 108th Ave NE	0	0	0	0	0	1	1	1	3	1.1
NE 68th Street, 108th Ave NE to 112th Ave NE	0	4	1	0	0	0	1	1	7	2.6

Source: Compiled by Heffron Transportation, Inc., from data provided by the City of Kirkland, June 2012

Transit Service

Transit service in the project area is provided by King County Metro (Metro). The bus stop nearest the site is about one-quarter mile to the east, located at State Street S and 10th Avenue S. This stop is served by northbound Metro Routes 234, 235, and 238. The nearest bus stop served by southbound Metro Routes 234 and 235 is located at Lakeview Drive and NE 64th Street, about a half mile southeast of the project site. All three routes provide daily bus service, with typical headways of about 30 minutes on weekdays and 60 minutes on weekends. Route 234 provides service between downtown Bellevue, south Kirkland, downtown Kirkland, and Kenmore. Route 235 provides service between downtown Bellevue, south Kirkland, downtown Kirkland, Totem Lake and Kingsgate. Both routes stop at the Kirkland Transit Center, the South Kirkland Park & Ride, and the Bellevue Transit Center, where passengers can transfer to Metro and Sound Transit routes that serve other regional destinations. Route 238 provides service between south Kirkland, Totem Lake, and Bothell.

Non-Motorized Transportation

As presented earlier in Table 3.4-1, all roadways in the project study area have sidewalks to accommodate pedestrians, and most also have marked bicycle lanes. Adjacent to the project site, Lake Street S has sidewalks and marked bicycle lanes on both sides. A marked and signed crosswalk with flags (that pedestrians may carry as they cross the street to call attention to oncoming vehicles) is located on Lake Street S just south of 10th Avenue S. Crosswalks with flags are provided at regular intervals along Lake Street S/Lake Washington Boulevard, with the next nearest crosswalks located about 1,100 feet to the north and 650 feet to the south.

Several waterfront parks, located to the west of Lake Street S/Lake Washington Boulevard, generate pedestrian and bicycle activity along the roadway. The nearest are Settler's Landing, located across from 10th Avenue S, and Marsh Park, located just south of the project site. Other waterfront parks in the area include Houghton Beach Park (less than one-half mile to the south), David E. Brink Park (less than one-quarter mile to the north), and Marina Park and Heritage Park in downtown Kirkland (less than one mile to the north). Regular pedestrian activity occurs between these parks, particularly along the west side of Lake Street S/Lake Washington Boulevard, which is the waterfront side of the street. Bicyclists also regularly use the bicycle lanes provided along the roadway.

The weekday AM peak hour counts conducted at Lake Street S/10th Avenue S found 65 pedestrians walking along Lake Street S on the west side of the street between 7:00 and 9:00 A.M., and 5 pedestrians walking along the east side of the street. Six pedestrians crossed Lake Street S at the crosswalk during this period. The bicyclists who traveled through the intersection during the two-hour AM peak period consisted of 8 northbound, 18 southbound, 10 eastbound, and 2 westbound.

The weekday PM peak hour counts conducted at Lake Street S/10th Avenue S found 163 pedestrians walking along Lake Street S on the west side of the street between 4:00 and 6:00 P.M., and 18 pedestrians walking along the east side of the street. 14 pedestrians crossed Lake Street S at the crosswalk during this period. The bicyclists who traveled through the intersection during the two-hour PM peak period consisted of 32 northbound, 0 southbound, 3 eastbound, and 18 westbound.

Parking

Parking in the vicinity of the project site is accommodated by a combination of private surface lots and garages that serve the existing development, and public on-street parking. As presented earlier in Table 3.4-1, both streets adjacent to the project site (Lake Street S and 10th Avenue S) have public on-street parking on both sides. Since existing residential and retail development in the area has private off-street parking, it is expected that the public parking generally serves either additional visitors to existing development or recreational activities along the Lake Washington waterfront. Field observation indicates that on-street parking is typically available in the area, but can fill up during peak times of recreational activity along the waterfront or in Downtown Kirkland.

3.4.2 Significant Impacts

This section describes the conditions that are expected to exist with full occupancy of the proposed project. The net difference between the without-project and with-project conditions was evaluated. The net increase in project-generated site trips was added to the 2014 without-project traffic volumes to estimate with-project traffic. Finally, level of service analysis was performed to determine the proposed project's potential impact on traffic operations in the study area. Potential impacts to traffic safety, transit, non-motorized facilities and parking were also assessed. The following sections describe the methodology used to determine these impacts.

Future Traffic Volumes with Project

Future-with-project traffic volumes are projected by calculating the net new trips expected to be generated by the proposed project, and adding them to the future-without-project volumes.

Trip Generation

The potential redevelopment would include two actions that would influence traffic near the site:

1. Removal of the existing retail uses and a single family house, and
2. Construction of the proposed new mixed use development with apartments and office space.

Traffic analysis was performed using the net change in site-generated trips, which is the difference between the trips generated by the existing and the proposed uses. The following describes the methods used to determine the change in traffic anticipated from the proposed project.

Trip generation for the proposed redevelopment was estimated using rates published by the Institute of Transportation Engineers (ITE), which compiles trip generation counts throughout the country for a variety of land-use types. ITE trip rates and methods reflect best practice for estimation of project trip generation. Trip generation rates and equations from *Trip Generation* [8] were applied based on the existing and proposed types of uses at the proposed project site. Table 3.4-7 summarizes the trip generation rates and equations used for this analysis.

Table 3.4-7 ITE Trip Generation Rates

Time of Day	Apartment	General Office	Medical Office	Retail
ITE Land Use Code	220	710	720	820
Weekday – Daily	T = 6.06(X) + 123.56 [1] 50% in, 50% out	11.01 trips/1,000 sf 50% in, 50% out	36.13 trips/1,000 sf 50% in, 50% out	42.94 trips/1,000 sf 50% in, 50% out
Weekday - AM Peak Hour	T = 0.49(X) + 3.73 [1] 20% in, 80% out	1.55 trips/1,000 sf 88% in, 12% out	2.30 trips/1,000 sf 79% in, 21% out	1.00 trips/1,000 sf 61% in, 39% out
Weekday - PM Peak Hour	T = 0.55(X) + 17.65 [1] 65% in, 35% out	1.49 trips/1,000 sf 17% in, 83% out	3.46 trips/1,000 sf 27% in, 73% out	3.73 trips/1,000 sf 49% in, 51% out
Saturday Peak Hour	0.52 trips/unit 50% in, 50% out [2]	0.41 trips/1,000 sf 54% in, 46% out	3.63 trips/1,000 sf 57% in, 43% out	4.89 trips/1,000 sf 52% in, 48% out
Sunday Peak Hour	0.51 trips/unit 50% in, 50% out [2]	0.14 trips/1,000 sf 58% in, 42% out	0.40 trips/1,000 sf 52% in, 48% out	3.12 trips/1,000 sf 49% in, 51% out

Source: Institute of Transportation Engineers, 8th Edition, 2008

1. *T = number of trip during time periods; X = number of dwelling units. Based on direction provided in the ITE Trip Generation Handbook[9], ITE trip equations were applied to estimate apartment-generated trips, rather than the average trip rates. Use of the equations is the prescribed ITE methodology for a project of the size proposed and results in slightly higher trip estimates than the average trip rates.*
2. *Directional distribution is assumed at 50% in and 50% out because ITE does not provide directional distribution for apartments during weekend peak hours.*

Table 3.4-8 summarizes the projected vehicle trip generation for the proposed redevelopment on a typical weekday. Full build-out of the proposed land use is estimated to generate up to 1,140 gross total vehicle trips per day, with about 86 trips occurring in the AM peak hour and 111 trips occurring in the PM peak hour. Trips associated with the existing uses on the site would be removed from the roadway network. After accounting for the removal of the existing retail uses and their associated traffic, the planned uses are projected to generate about 1,050 net new trips

[8] Institute of Transportation Engineers (ITE), Trip Generation, 8th Edition, 2008.
[9] Institute of Transportation Engineers (ITE), Trip Generation Handbook, 2nd Edition, 2004.

per day, with about 84 net new trips occurring in the AM peak hour and 103 net new trips occurring in the PM peak hour.

Table 3.4-8 Trip Generation Summary – Weekday

	Size	*Daily*	AM Peak Hour			PM Peak Hour		
			In	*Out*	*Total*	*In*	*Out*	*Total*
PROPOSED PROJECT								
Apartment (LU 220)	143 units	990	15	59	74	62	34	96
General Office (LU 710)	3,200 sf	40	4	1	5	1	4	5
Medical Office (LU 720)	3,000 sf	110	6	1	7	3	7	10
Total Vehicle Trips with Project		**1,140**	**25**	**61**	**86**	**66**	**45**	**111**
EXISTING SITE								
Retail (LU 820)	2,114 sf	-90	-1	-1	-2	-4	-4	-8
Total Existing Vehicle Trips		**-90**	**-1**	**-1**	**-2**	**-4**	**-4**	**-8**
NET CHANGE IN VEHICLE TRIPS		**1,050**	**24**	**60**	**84**	**62**	**41**	**103**

Source: Heffron Transportation, June 2012.

It should be noted that these trip generation estimates are conservatively high in that they assume that all trips generated by the project would occur by vehicle. Survey results from the year 2000 Census compiled by the Puget Sound Regional Council (PSRC) indicate that for residences located in PSRC Transportation Analysis Zone 265 (the PSRC zone in which the project site is located), about 92% of trips typically occur by vehicle and 8% occur by transit or non-motorized modes.[10]

Table 3.4-9 summarizes the projected vehicle trip generation for the proposed redevelopment during each peak hour of a typical Saturday and Sunday. As shown, 76 net new trips are expected to be generated by the site during the highest volume hour on a Saturday, and 67 net new trips are projected for the highest volume hour on a Sunday. The projected weekend peak hour net new trips are lower than the net new trips projected during the weekday AM or PM peak hours.

[10] Puget Sound Regional Council (PSRC), Journey-to-Work data from 2000 U.S. Census data for PSRC Transportation Analysis Zone 265.

Table 3.4-9 Trip Generation Summary – Weekend

	Size	**Saturday Peak Hour**			**Sunday Peak Hour**		
		In	*Out*	*Total*	*In*	*Out*	*Total*
PROPOSED PROJECT							
Apartment (LU 220)	143 units	37	37	74	37	36	73
General Office (LU 710)	3,200 sf	1	0	1	0	0	0
Medical Office (LU 720)	3,000 sf	6	5	11	1	0	1
Total Vehicle Trips with Project		**44**	**42**	**86**	**38**	**36**	**74**
EXISTING SITE							
Retail (LU 820)	2,114 sf	-5	-5	-10	-3	-4	-7
Total Existing Vehicle Trips		**-5**	**-5**	**-10**	**-3**	**-4**	**-7**
NET CHANGE IN VEHICLE TRIPS		**39**	**37**	**76**	**35**	**32**	**67**

Source: Heffron Transportation, June 2012.

Trip Distribution and Assignment

Trip distribution patterns for this project were obtained from the City of Kirkland and were based on the City's travel demand forecasting model. The estimated net changes in project-generated traffic were distributed through the study area intersections using these trip distribution patterns. The project trip distribution patterns and assignments of net new project trips at the study intersections during the AM and PM peak hours are shown on Figures 3.4-9 and 3.4-10, respectively.

For vehicles approaching the project site from westbound NE 68th Street and southbound State Street S, there are two potential routes that drivers could choose, shown on Figure 3.4-11. The first route is referenced as Access Scenario 1 in this DEIS. For this route, drivers would turn westbound on to 10th Avenue S, turn left (southbound) on to Lake Street S, and then turn left again into the project site. The second route is referenced as Access Scenario 2 in this DEIS. For this route, drivers would proceed to southbound Lakeview Drive, turn right (westbound) onto one of the local access streets that connect Lakeview Drive and Lake Street S (most likely NE 64th Street), turn right (northbound) onto Lake Street S, and then turn right into the project site.

While the first access route covers a slightly shorter travel distance, it is expected that traffic calming devices on 10th Avenue S, combined with peak hour delay associated with making the series of left turns, would likely result in a longer travel time. In addition to a potential shorter travel time for the alternate "right turn" access route, reliance on right turns to access the site would likely result in a more predictable travel time than reliance on left turns. Therefore, for the purposes of peak hour trip assignment, it was assumed that about two-thirds of drivers would choose the right-turn route (7 vehicles during the AM peak hour and 18 vehicles during the PM peak hour), and one-third would choose the left turn route (4 vehicles during the AM peak hour and 9 vehicles during the PM peak hour). However, the implications of more drivers choosing either of these possible routes are evaluated in more detail later in the *Site Access and Neighborhood Circulation* section of this chapter.

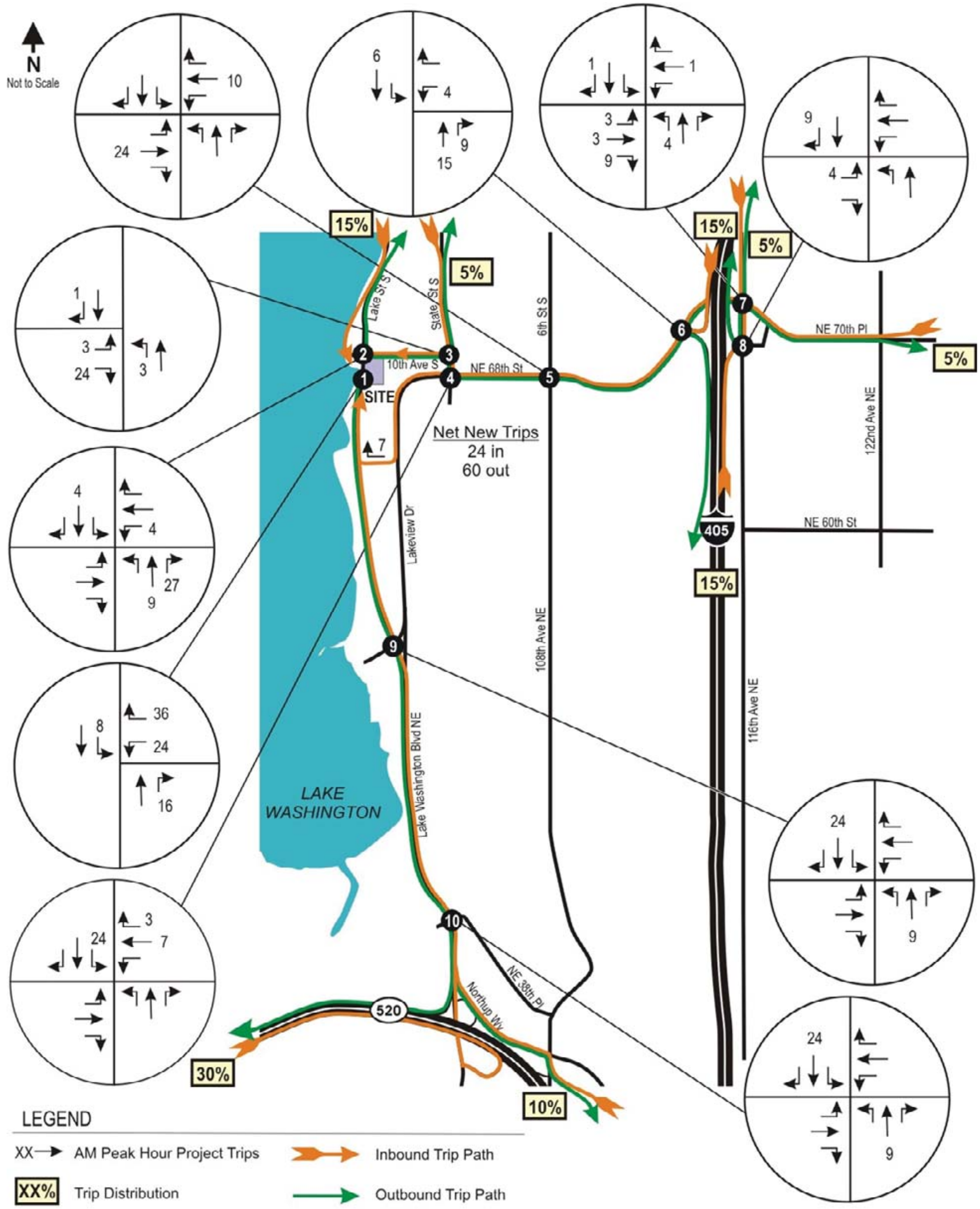

FIGURE 3.4-9

NET NEW TRIP ASSIGNMENT– AM PEAK HOUR

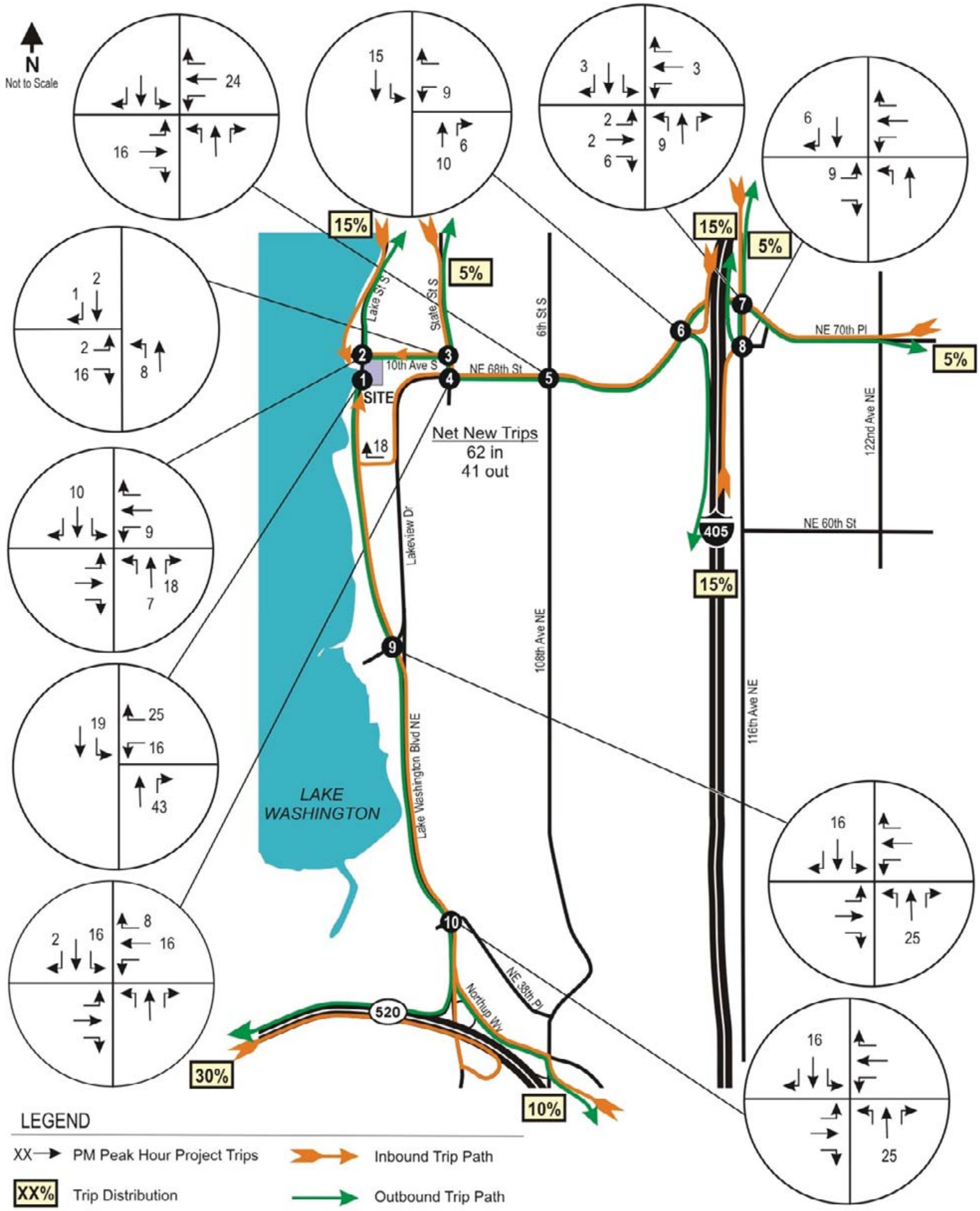

FIGURE 3.4-10

NET NEW TRIP ASSIGNMENT– PM PEAK HOUR

FIGURE 3.4-11

ACCESS AND EGRESS SCENARIOS

There are also two possible routes that outbound vehicles from the project site to southbound Lake Street S/Lake Washington Boulevard could choose, shown on Figure 3.4-11. The first route is referenced as Egress Scenario 1 in this DEIS. For this route, drivers would turn left out of the project site directly on to southbound Lake Street S, which would be the most direct. However, when traffic volumes are high on Lake Street S, it is possible that some outbound drivers destined to the south would choose an alternate route, referenced as Egress Scenario 2 in this DEIS. For this route, drivers would turn right out of the site driveway, and continue to make right turns on to 10th Avenue S, State Street S and NE 68th Street, continuing southbound on Lakeview Drive to Lake Washington Boulevard.

The first egress route (turning left out of the site driveway) would be most direct, and also would result in the most congested level of service at the site driveway. Therefore, for the purposes of peak hour trip assignment, it was assumed that all outbound vehicles destined for southbound Lake Street S/Lake Washington would turn left out of the site driveway (24 vehicles during the AM peak hour and 16 vehicles during the PM peak hour). However, the implications of drivers alternatively choosing the right-turn egress route is evaluated in detail in the *Site Access and Neighborhood Circulation* section of this chapter.

The net new project trips were added to the 2014-without-project traffic volumes to estimate 2014-with-project traffic volumes. The forecast 2014 AM and PM peak hour with-project traffic volumes are shown on Figures 3.4-12 and 3.4-13, respectively.

Net new daily trips were also distributed through the study area intersections in order to estimate the intersection Proportional Shares. As discussed earlier, a project's proportional shares are determined using established City procedures in which Proportional Share Impact Worksheets are completed, and represent the proportion of net new project trips to the total intersection capacity. Table 3.4-10 summarizes the project proportional shares calculated for study area intersections. As shown, the highest proportional share (4.20%) is projected at 108th Ave/6th Street S/NE 68th Street. The project proportional shares at the remaining study intersections are generally between 1% and 3%.

Table 3.4-10 Project Proportional Share at Study Area Intersections

	Intersection	*Project Trip Proportional Share*
2.	Lake Street S/10th Avenue S	1.97%
3.	State Street S/10th Avenue S	2.62%
4.	State Street S/NE 68th Street	2.65%
5.	108th Ave/6th Street S/NE 68th Street	4.20%
6.	NE 72nd Place/I-405 SB Ramps	1.47%
7.	116th Avenue NE/NE 70th Place	1.78%
8.	116th Avenue NE/I-405 NB Ramps	0.95%
9.	Lake Washington Boulevard/Lakeview Drive	1.26%
10.	Lake Washington Boulevard/NE 38th Street	1.26%

Source: Heffron Transportation, June 2012

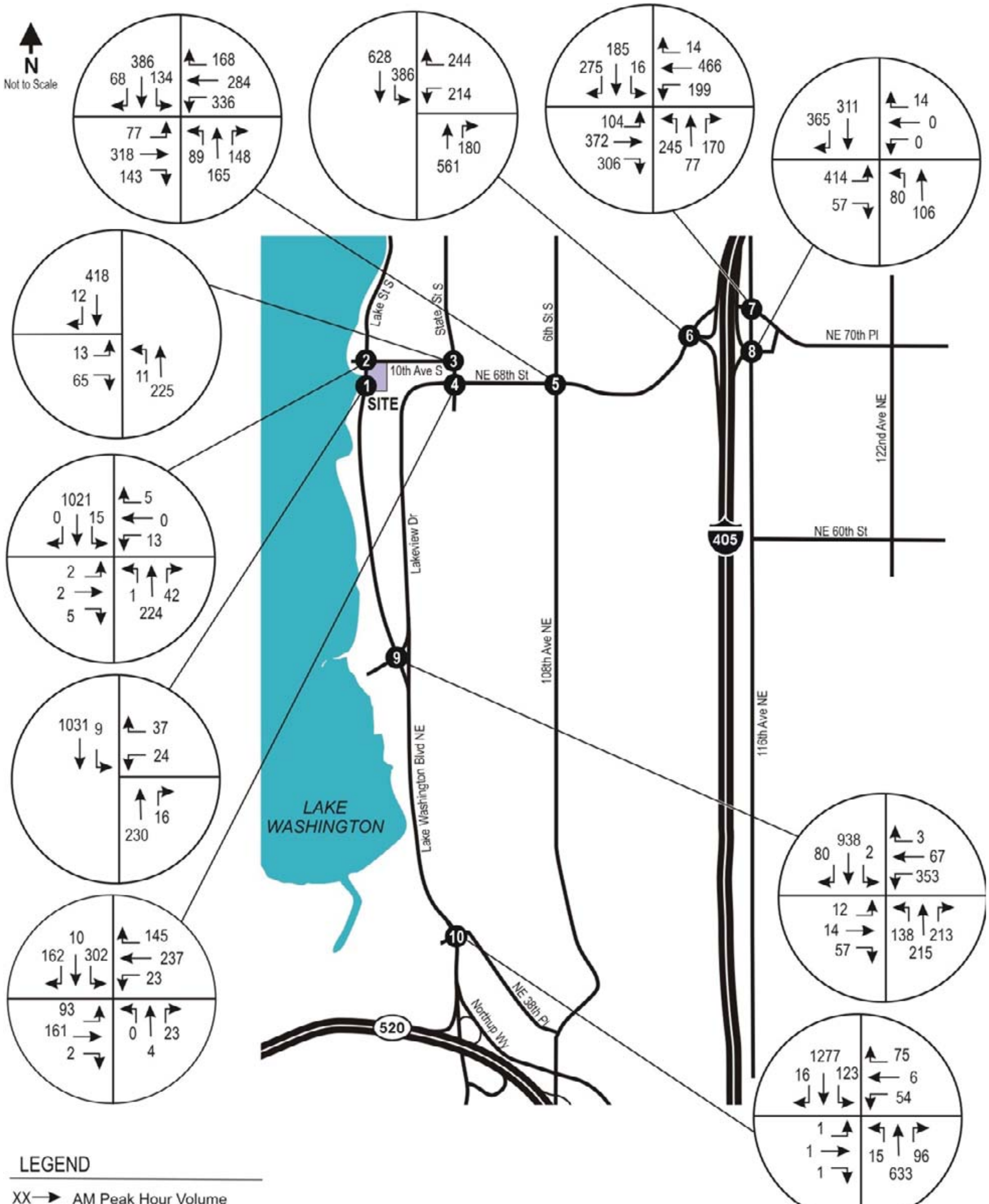

FIGURE 3.4-12

2014 WITH PROJECT TRAFFIC VOLUMES – AM PEAK HOUR

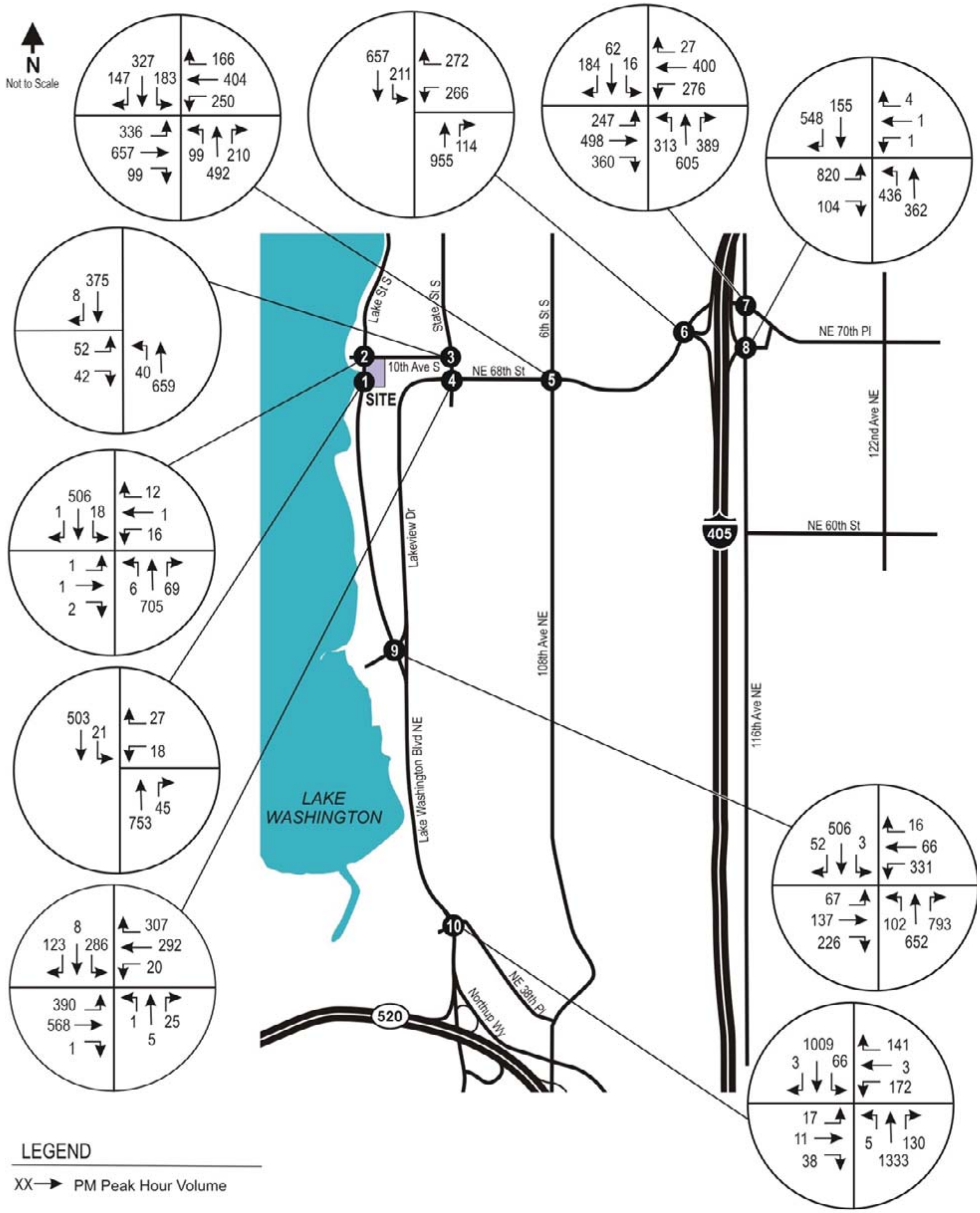

FIGURE 3.4-13

2014 WITH PROJECT TRAFFIC VOLUMES – PM PEAK HOUR

Level of Service with Project

Weekday Level of Service

Table 3.4-11 shows the levels of service for study area intersections that were calculated for 2014-with-project weekday AM and PM peak hour conditions, using the methodologies described previously. Levels of service for without-project conditions are shown for comparison.

As shown, the project is expected to add about 1 to 3 seconds of average delay at each of the signalized study area intersections. During the AM peak hour, all signalized intersections are expected to remain at LOS D or better with the project in place. During the PM peak hour, the project would add 1 to 3 seconds of average delay at the four intersections projected to operate at LOS E or F under 2014-without-project conditions.

At the unsignalized study area intersections, the project is expected to add 1 to 12 seconds of average delay to the stop-controlled movements. At Lake Street S/10th Avenue S, the project is expected to degrade the level of service for the westbound stop-controlled movement from LOS D to LOS E during both the AM and PM peak hours. At State Street S/10th Avenue S, the project is expected to degrade the eastbound stop-controlled movement from LOS D to LOS E during the PM peak hour. The project is expected to add less than two seconds of average delay to this movement, but under 2014-without-project conditions, average delay is only one-half second below the LOS E threshold.

These results reflect the site access scenario described previously whereby approximately one-third of the inbound vehicles approaching from the east choose to access the site via 10th Avenue E, and two-thirds would choose to approach making right turns. They also reflect the site egress scenario described previously whereby all outbound trips destined for southbound Lake Street S/Lake Washington Boulevard would turn directly left out of the site driveway. The potential effects of more or fewer project-generated vehicles choosing the other possible access and egress routes are evaluated in detail in the *Site Access and Neighborhood Circulation* section.

As described earlier, City of Kirkland guidelines indicate that a level of service impact is significant and mitigation needed if the project's proportional share is greater than 15% of capacity at an intersection expected to operate at LOS E, or 5% of capacity at an intersection expected to operate at LOS F. Table 3.4-12 summarizes the project proportional shares at the intersections projected to operate at LOS E or F under 2014-with-project conditions (also shown previously in Table 3.4-10). As shown, the project proportional shares do not exceed the thresholds defined by the City; therefore, the level of service impact does not meet the City's standard for significance and no mitigation would be required.

Table 3.4-11 Future Levels of Service – Without and With Project – AM and PM Peak Hours

	Future (2014) Without Project				Future (2014) With Project			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS[1]	*Delay*[2]	*LOS*	*Delay*	*LOS*	*Delay*	*LOS*	*Delay*
Unsignalized Intersections [3]								
1. Lake Street S/Site Driveway								
Westbound movement	A	9.7	C	21.7	C	20.9	D	26.9
Northbound movement	A	0.0	A	0.0	A	0.0	A	0.0
Southbound movement	A	0.0	A	0.1	A	0.2	A	0.8
2. Lake Street S/10th Avenue S								
Eastbound movement	D	29.3	D	31.1	D	30.4	D	32.3
Westbound movement	D	32.1	D	27.8	**E**	**39.2**	**E**	**39.8**
Northbound movement	A	0.1	A	0.2	A	0.1	A	0.2
Southbound movement	A	0.4	A	0.7	A	0.4	A	0.7
3. State Street S/10th Avenue S								
Eastbound movement	B	13.3	D	34.6	B	13.8	**E**	**36.3**
Northbound movement	A	0.4	A	0.9	A	0.6	A	1.1
Southbound movement	A	0.0	A	0.0	A	0.0	A	0.0
Signalized Intersections [4]								
4. State Street S/ NE 68th Street	B	18.2	C	27.7	B	18.9	C	28.8
5. 6th Street S/108th Avenue NE/NE 68th Street	D	43.7	**E**	**67.5**	D	45.0	**E**	**68.3**
6. NE 72nd Place/ I-405 Southbound Ramps	C	32.9	**E**	**57.1**	C	34.8	**E**	**59.8**
7. 116th Avenue NE/ NE 70th Place	C	24.6	C	32.3	C	24.9	C	32.5
8. 116th Avenue NE/ I-405 Northbound Ramps	B	18.4	**F**	**85.9**	B	18.6	**F**	**86.2**
9. Lake Washington Blvd/ Lakeview Drive	D	43.9	C	21.9	D	46.7	C	22.4
10. Lake Washington Blvd/ NE 38th Place	B	13.3	**E**	**64.5**	B	13.3	**E**	**66.8**

Source: Heffron Transportation, 2012
1. Level of Service.
2. Average seconds of delay per vehicle.
3. For unsignalized intersections, level of service is based upon the average delay for the stop-controlled and permitted left-turn movements, because they experience the highest delay.
4. For signalized intersections, level of service is based upon average delay for all intersection movements.
5. LOS E and LOS F intersection levels of service and average delay are highlighted.

Table 3.4-12 Project Proportional Shares at LOS E and LOS F Intersections

	Intersection	*LOS with Project*	*Project Proportional Share* [1]	*Proportional Share Threshold* [2]	*Exceeds threshold?*
2.	Lake Street S/10th Avenue S	E	1.97%	15%	No
3.	State Street S/10th Avenue S	E	2.62%	15%	No
5.	108th Avenue/6th Street S/NE 68th Street	E	4.20%	15%	No
6.	NE 72nd Place/I-405 SB Ramps	E	1.47%	15%	No
8.	116th Avenue NE/I-405 NB Ramps	F	0.95%	5%	No
10.	Lake Washington Blvd/NE 38th Street	E	1.26%	15%	No

1. Source: Heffron Transportation, June 2012
2. Source: City of Kirkland, Transportation Impact Analysis Guidelines, February 2004

Weekend Level of Service

Table 3.4-13 shows the levels of service at the Lake Street S/Site Driveway intersection during the Saturday and Sunday peak hours for 2014-with-project conditions. Levels of service for without-project conditions are shown for comparison. It should be noted that the estimated weekend with-project volumes are conservatively high because they combine the peak hour of traffic expected to be generated by the project with the peak hour of traffic on Lake Street S. However, the site-generated traffic and the adjacent street traffic may not in fact peak simultaneously. With this conservative assumption applied for 2014-with-project conditions, the weekend peak hour operations at the site driveway are expected to be similar to the weekday AM peak hour, but better than the weekday PM peak hour. This analysis confirms that the weekday PM peak hour reflects the worst-case for the with-project condition.

Table 3.4-13 Future Levels of Service at Project Site – Without and With Project – Weekend

	Future (2014) Without Project				**Future (2014) With Project**			
	Saturday Peak Hour		**Sunday Peak Hour**		**Saturday Peak Hour**		**Sunday Peak Hour**	
	LOS[1]	*Delay*[2]	*LOS*	*Delay*	*LOS*	*Delay*	*LOS*	*Delay*
Unsignalized Intersections [3]								
1. Lake Street S/Site Driveway								
Westbound movement	C	16.5	C	18.5	C	19.5	C	20.4
Northbound movement	A	0.0	A	0.0	A	0.0	A	0.0
Southbound movement	A	0.1	A	0.0	A	0.4	A	0.4

Source: Heffron Transportation, 2012
1. Level of Service.
2. Average seconds of delay per vehicle.
3. For unsignalized intersections, level of service is based upon the average delay for the stop-controlled and permitted left-turn movements, because they experience the highest delay.

Vehicle Gap Analysis

Data were collected to assess the adequacy of gaps in traffic along Lake Street S for vehicles turning out of and into the project site driveway. Analysis was conducted for left turns out of the site (westbound to southbound), right turns out of the site (westbound to northbound), and left turns into the site (southbound to eastbound). Table 3.4-14 summarizes the time gap needed to make each of these turns based upon standards established by the American Association of State Highway and Transportation Officials (AASHTO).[11]

Table 3.4-14 Time Gaps Needed for Turn Maneuvers

Turn Type	Time Gap Needed for a Passenger Car to Turn On/Off a Two Lane Roadway	Additional Time Needed to Cross Parking/Bike Lane	Total Time Gap Needed
Outbound Left Turn	7.5 seconds	0.5 seconds	**8.0 seconds**
Outbound Right Turn	6.5 seconds	0.5 seconds	**7.0 seconds**
Inbound Left Turn	5.5 seconds	0.5 seconds	**6.0 seconds**

Source: American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Streets, Exhibits 9-54, 9-57, 9-66, 4th Edition, 2001

Existing vehicle gaps on Lake Street S in front of the site were measured for every hour of seven days, using the machine counts conducted from May 12 through May 18, 2012. As described earlier, this week included a holiday (Mother's Day) and the weather was generally warm and sunny, so weekend traffic volumes reflect conditions conducive to higher levels of activity and traffic volumes in the study area. For left turns out of the site, measured gaps account for the combined northbound and southbound traffic on Lake Street S since these left turning vehicles would need gaps in both directions of traffic. For right turns out of the site and left turns into the site, measured gaps account for the northbound traffic on Lake Street S, since these movements would need gaps only in the northbound traffic. Outbound right turns and inbound left turns would also be able to utilize the same traffic gap, if needed, because these movements do not overlap. The traffic count machines measure gap data in 2-second intervals (1-2 seconds, 3-4 seconds, etc…); therefore, the lowest gap interval that would fully accommodate each turn was used—for outbound left turns, the 9-10 second gap was the lowest interval considered, because not all gaps in the 7-8 second interval would accommodate the time gap needed.

Table 3.4-15 summarizes turning gap conditions for the weekday AM, weekday PM, Saturday, and Sunday peak hours. For each time period, the hour is shown within the seven-day count period in which measured conditions were the worst (had the least number of gaps). For each peak period, the table summarizes the total number of turns that are expected to occur to and from the site driveway, the percentage of time within each peak hour that an adequate gap was available, and the number of gaps that were available.

[11] American Association of State Highway and Transportation Officials (AASHTO), A Policy on Geometric Design of Highways and Streets, 4th Edition, 2001.

Table 3.4-15 Peak Hour Gap Analysis at Site Driveway

Turn Type/ Peak Period	*# of Turning Vehicles with Project*	**≥ 9 sec (combined NB/SB)**		**≥ 7 sec (NB only)**	
		% of hour with 9-sec gap available	*# of 9-sec gaps available*	*% of hour with 7-sec gap available*	*# of 7- sec gaps available*
Outbound Left Turn					
Weekday AM Peak	24	15%	60	---	---
Weekday PM Peak	18	19%	76	---	---
Saturday Peak	17	25%	102	---	---
Sunday Peak	15	24%	97	---	---
Outbound Right Turn					
Weekday AM Peak	37	---	---	90%	462
Weekday PM Peak	27	---	---	59%	303
Saturday Peak	25	---	---	73%	376
Sunday Peak	21	---	---	71%	364
Inbound Left Turn					
Weekday AM Peak	9	---	---	90%	462
Weekday PM Peak	21	---	---	59%	303
Saturday Peak	15	---	---	73%	376
Sunday Peak	13	---	---	71%	364

Source: Heffron Transportation, June 2012

The table shows that conditions are most constrained for the outbound left turn movement. This is to be expected, since this movement requires a longer traffic gap, and also requires a simultaneous gap in both northbound and southbound traffic. While the data indicate that adequate gaps currently exist to accommodate the expected left turn demand, the percent of the peak hour in which adequate gaps exist is relatively low, ranging from 15% during the weekday AM peak hour to 25% during the Saturday peak hour. This, combined with the expected average delays at the site driveway presented previously in Table 3.4-11 and Table 3.4-13, indicates that while an adequate number of gaps currently exist for the expected outbound left-turn movement, drivers leaving the project site may experience extended waits for adequate gaps during peak hour conditions. For future conditions with higher traffic volumes on Lake Street S, the available gaps would likely decrease, but even if they reduce by 50% there would still be more available gaps than outbound left turns. However, the time that an individual driver may need to wait for an adequate gap to become available could be quite long.

For right turns out of the site and left turns into the site, the count data indicate that many adequate gaps exist, and that the gaps are available for the greater share of each peak hour. The most constrained period for these two movements is the weekday PM peak hour, but there are still far more gaps available than the expected demand.

These results, combined with the level of service analysis at the site driveway, indicate that during peak hours, right turns out of the site could be more attractive to drivers than left turns. If drivers waiting to turn left (southbound) out of the site driveway experience longs delays while waiting for adequate gaps, they may choose instead to turn right and go around the block to State Street S, and then proceed southbound on Lakeview Drive to Lake Washington Boulevard. This is evaluated in detail in the *Site Access and Neighborhood Circulation* section.

Sight Distance at Driveway

Departure sight distance is the distance sufficient for a stopped driver on a minor road or driveway approach to enter or cross the major road. According to the City's sight distance guidelines, the proposed site access would be a Type E3 driveway, because it would have a PM peak hour volume between 50 and 200 vehicles.[12] For a Type E3 driveway intersecting a street with a speed limit of 30 mph and average daily traffic that exceeds 6,000 vehicles, City guidelines indicate 200 feet for minimum sight distance and 335 feet for desirable sight distance. Sight distance is measured from 14 feet behind the edge of the traveled way. Field measurements conducted at the site indicate that sight distance is greater than 400 feet to the north, and greater than 800 feet to the south. These distances exceed the City's minimum and desired thresholds. Similar to conditions at other site access driveways along Lake Street S/Lake Washington Boulevard, vehicles parked on the street have the potential to obstruct sight distance. The new site access driveway would be required to meet City of Kirkland design standards and ensure adequate sight triangles are provided. This may require an adjustment to on-street parking immediately adjacent to the proposed driveway.

Site Access and Neighborhood Circulation

This section presents analysis of the proposed site access driveway and potential local site area circulation. As described previously, the level of service results presented in Table 3.4-11 reflect the site access scenario in which approximately one-third of the inbound vehicles approaching from the east choose to access the site via 10th Avenue E, and two-thirds choose to approach making right turns. They also reflect the site egress scenario in which all outbound trips destined for southbound Lake Street S/Lake Washington Boulevard would turn directly left out of the site driveway. However, for each of these two movements, drivers could choose alternate routes, the extent to which will likely to depend on how much time it takes to turn left on to Lake Street S in the vicinity of the project site. The following sections also describe the potential effects of more or fewer project-generated vehicles choosing the alternate access and egress routes.

Potential Site Access Patterns for Vehicles Approaching from the East

For vehicles approaching the project site from westbound NE 68th Street and southbound State Street S, there are two potential routes that drivers could choose, shown previously on Figure 3.4-11. The project trip distribution shown on Figures 3.4-9 and 3.4-10 reflects an assumption that about one-third of vehicles approaching from the east would turn westbound on to 10th Avenue S, turn left (southbound) on to Lake Street S, and then turn left again into the project site (Access Scenario 1). It also assumes that two-thirds of vehicles would proceed to southbound Lakeview Drive, turn right (westbound) onto one of the local access streets that connect Lakeview Drive and Lake Street S (most likely NE 64th Street), turn right (northbound) onto Lake Street S, and then turn right into the project site (Access Scenario 2).

[12] City of Kirkland, Sight Distance Guidelines, 2012

To determine the sensitivity of the intersection analysis results to these alternate routes, level of service analysis was conducted for the two extreme conditions: (1) all vehicles approaching from the east use 10th Avenue S, shown on Figure 3.4-14, and (2) all vehicles approaching from the east use NE 64th Street, shown on Figure 3.4-15. The intersection levels of service that would change according to what routes the drivers choose are presented in Table 3.4-16. As shown, Access Scenario 1 would result in increased average delay at all three stop-controlled intersections, potentially degrading the westbound movement at Lake Street S/10th Avenue S to LOS F during the PM peak hour. This is to be expected since under this scenario, the maximum potential left turns would occur at the stop-controlled intersection legs. However, as shown in Table 3.4-17, the project's proportional share with this scenario would still be lower than the City's thresholds for significance or mitigation.

Access Scenario 2 would result in lower levels of delay than was previously presented in Table 3.4-11, with the stop-controlled intersections projected to operate at LOS D. This is to be expected because this scenario would result in a lower number of left turns occurring at the stop-controlled intersections.

Table 3.4-16 also presents the ranges of peak hour project-generated trips that could occur on 10th Avenue E and NE 64th Street, depending on the proportion of incoming vehicles that choose each potential route. On 10th Avenue S, project-generated trips during the PM peak hour could range from about 18 vehicles per hour (an average rate of one vehicle every 3.3 minutes) to about 45 vehicles per hour (an average rate of one vehicle every 1.3 minutes). On NE 64th Street, project generated trips during the PM peak hour could range from zero vehicles per hour to about 27 vehicles per hour (an average rate of one vehicle every 2.2 minutes).

These results indicate that during periods with higher traffic volumes on Lake Street S, it is likely that more vehicles would choose the "right turn" route via NE 64th Street to access the site from the east. This shift would improve operation at the stop-controlled intersections and would have negligible effect on the operation of the signalized State Street S/NE 68th Street intersection. More vehicles taking the right turn route to access the site would result in more vehicles traveling westbound on NE 64th Street, and fewer vehicles traveling westbound on 10th Avenue S (up to 11 vehicles during the AM peak hour and 27 vehicles during the PM peak hour).

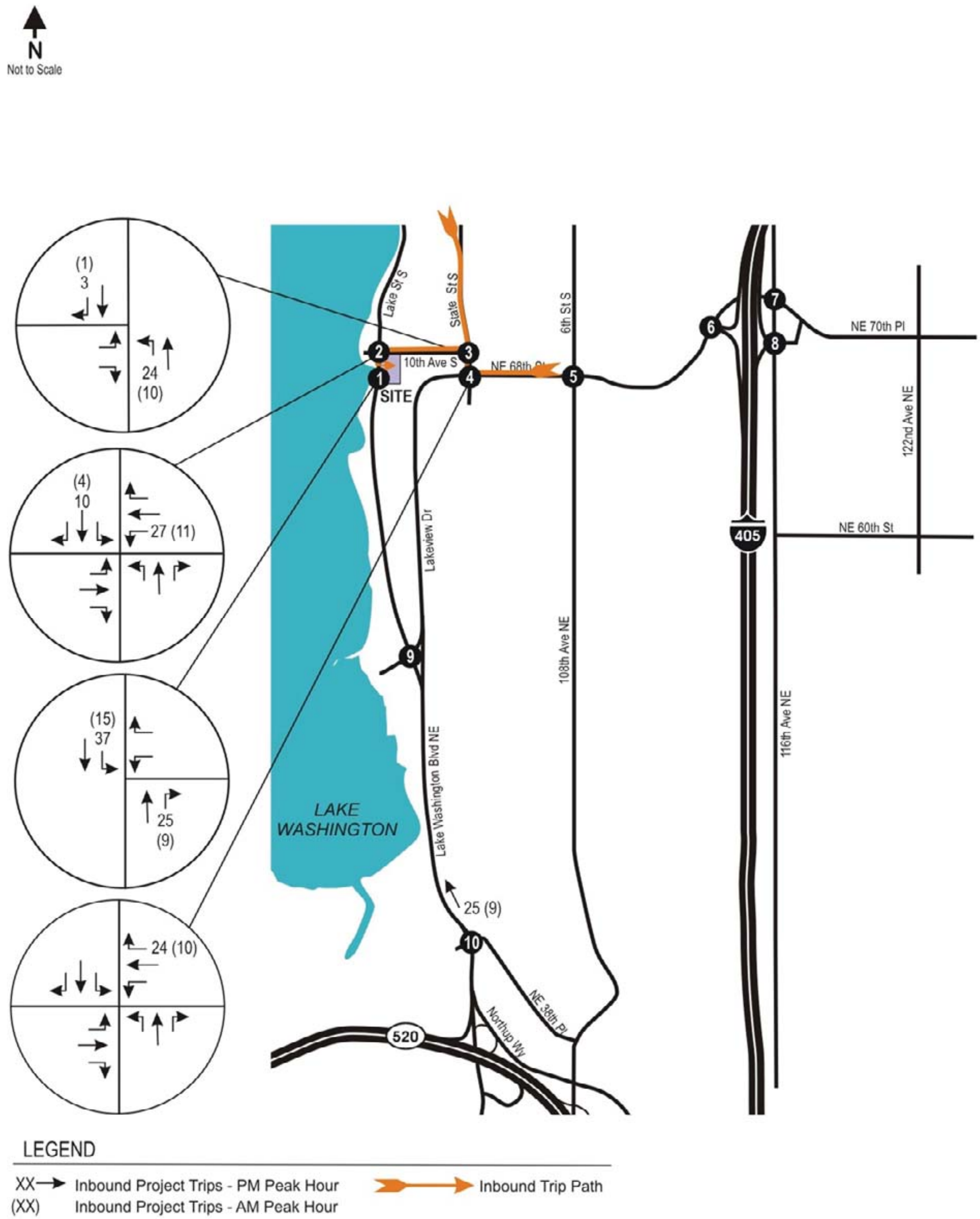

FIGURE 3.4-14

ACCESS SCENARIO 1 – INBOUND VEHICLES FROM EAST USE 10TH AVE S (LEFT TURNS)

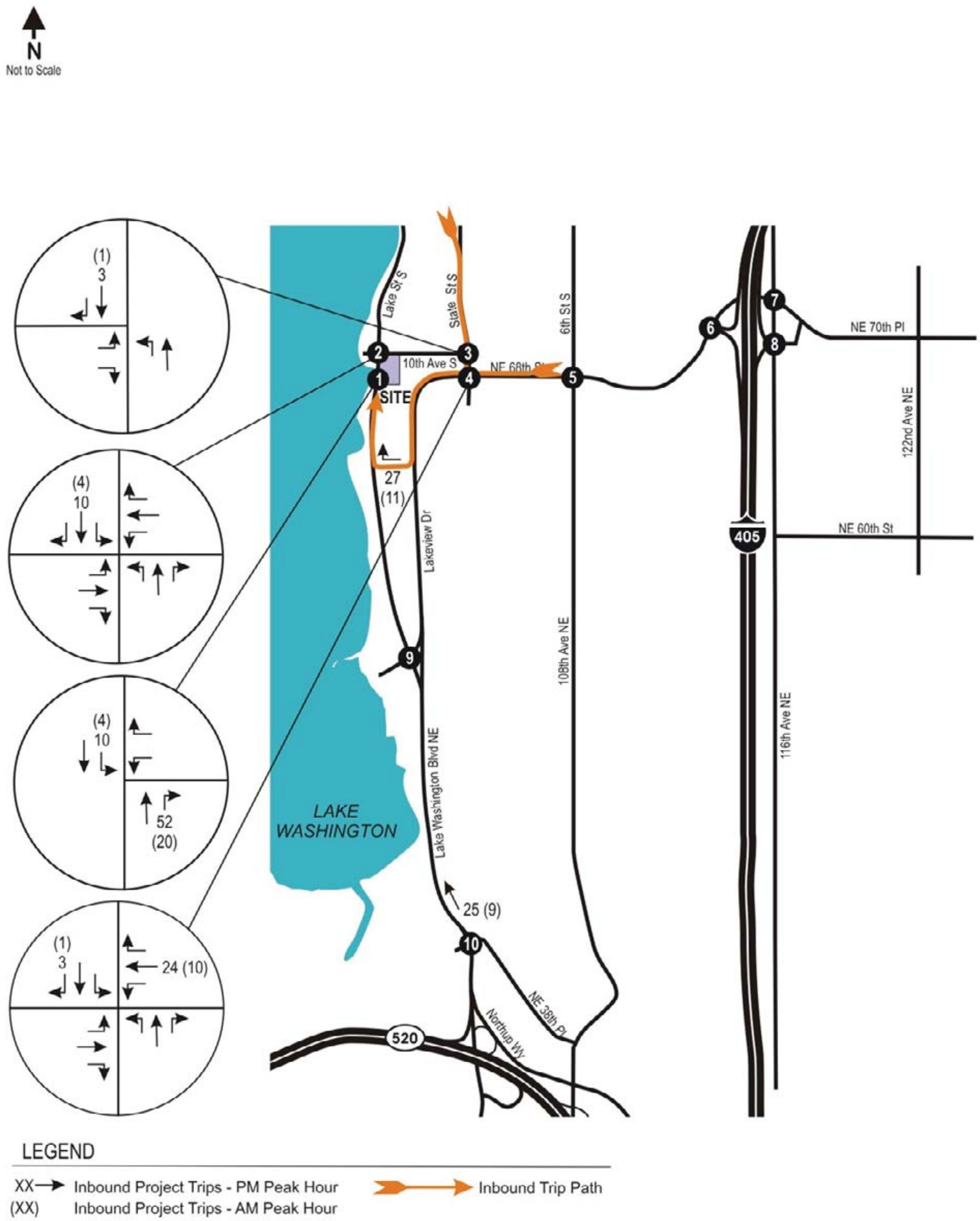

FIGURE 3.4-15

ACCESS SCENARIO 2 – INBOUND VEHICLES FROM EAST USE NE 64TH STREET (RIGHT TURNS)

Table 3.4-16 2014-With-Project Level of Service Comparison of Potential Site Access Patterns

	Access Scenario 1 Inbound Trips from East Travel to Site via 10th Avenue E				Access Scenario 2 Inbound Trips from East Travel to Site via NE 64th Street			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS[1]	Delay[2]	LOS	Delay	LOS	Delay	LOS	Delay
Unsignalized Intersections [3]								
1. Lake St S/Site Driveway								
Westbound movement	C	21.2	D	28.2	C	20.7	D	26.3
2. Lake Street S/10th Ave S								
Eastbound movement	D	30.4	D	32.3	D	30.4	D	32.3
Westbound movement	**E**	**48.4**	**F**	**62.5**	D	33.8	D	28.9
3. State Street S/10th Ave S								
Eastbound movement	B	14.0	**E**	**40.2**	B	13.8	D	34.6
Signalized Intersection [4]								
4. State St S / NE 68th St	B	18.6	C	28.2	B	19.0	C	29.2
Project Trips on 10th Ave S	38		45		27		18	
Project Trips on NE 64th St	0		0		11		27	

Source: Heffron Transportation, 2012
1. Level of Service.
2. Average seconds of delay per vehicle.
3. For unsignalized intersections, level of service is based upon the average delay for the stop-controlled and permitted left-turn movements, because they experience the highest delay.
4. For signalized intersections, level of service is based upon average delay for all intersection movements.
5. LOS E and LOS F intersection levels of service and average delay are highlighted.

Table 3.4-17 Proportional Shares at LOS E and LOS F Intersections – Access Scenarios

		Access Scenario 1				Access Scenario 2			
	Intersection	*LOS with Project*	*Project Propor-tional Share* [1]	*Thresh-old* [2]	*Exceeds thresh-old?*	*LOS with Project*	*Project Propor-tional Share* [1]	*Thresh-old* [2]	*Exceeds thresh-old?*
2.	Lake Street S/ 10th Avenue S	F	3.15%	5%	No	D	1.18%	N/A	N/A
3.	State Street S/ 10th Avenue S	E	2.83%	15%	No	D	2.41%	N/A	N/A

1. Source: Heffron Transportation, June 2012
2. Source: City of Kirkland, Transportation Impact Analysis Guidelines, February 2004

Potential Site Egress Patterns for Vehicles Destined to the South

For outbound vehicles from the project site to southbound Lake Street S/Lake Washington Boulevard, there are two potential routes that drivers could choose, shown previously on Figure 3.4-11. The project trip distribution shown on Figures 3.4-9 and 3.4-10 reflects an assumption that drivers would turn left out of the project site directly on to southbound Lake Street S (Egress Scenario 1). Alternatively, when traffic volumes are high on Lake Street S, it is possible that some outbound drivers destined to the south would choose to turn right out of the site driveway, and continue to make right turns on to 10th Avenue S, State Street S and NE 68th Street, continuing southbound on Lakeview Drive to Lake Washington Boulevard (Egress Scenario 2.

To determine the sensitivity of the intersection analysis results to these alternate routes, level of service analysis was conducted for the two extreme conditions: (1) all outbound vehicles destined to the south turn left out of site, shown previously on Figures 3.4-9 and 3.4-10, and (2) all outbound vehicles destined to the south turn right out of site, shown on Figure 3.4-16. The intersection levels of service that would change according to what routes the drivers choose are presented in Table 3.4-18. The levels of service for Egress Scenario 1 are those previously presented in Table 3.4-11. For Egress Scenario 2, all vehicles would depart the site using right turns, so average delay for the outbound (westbound) driveway movement would be lower. Average delay would be slightly higher at Lake Street S/10th Avenue S due to the increased number of vehicles that would travel through the intersection; the increase in average delay is expected to be less than one second, as the additional vehicles would all make right turns and would have little impact to delay. Level of service at State Street S/10th Avenue S is expected be similar under both scenarios (the projected decrease in average delay is due to a higher proportion of vehicles in the stop-controlled direction making right turns and experiencing lower delay than the left-turning vehicles). As shown in Table 3.4-19, the project's proportional share with this scenario would still be lower than the City's thresholds for significance or mitigation.

Table 3.4-18 also presents the ranges of peak hour project-generated trips that could occur on 10th Avenue S, depending on the proportion of incoming vehicles that choose each potential route. On 10th Avenue S, peak hour project-generated trips could range from about 27 vehicles per hour (an average rate of one vehicle every 2.2 minutes) to about 55 vehicles per hour (an average rate of one vehicle every 1.1 minutes).

These results indicate that during periods with higher traffic volumes on Lake Street S, it is likely that some vehicles would choose the "right turn" route via NE 64th Street to access the site from the east, but this shift would not significantly affect the level of service at the study area intersections. More vehicles taking the right turn route would result in more vehicles traveling eastbound on 10th Avenue S (up to 24 additional vehicles during the AM peak hour and 16 additional vehicles during the PM peak hour).

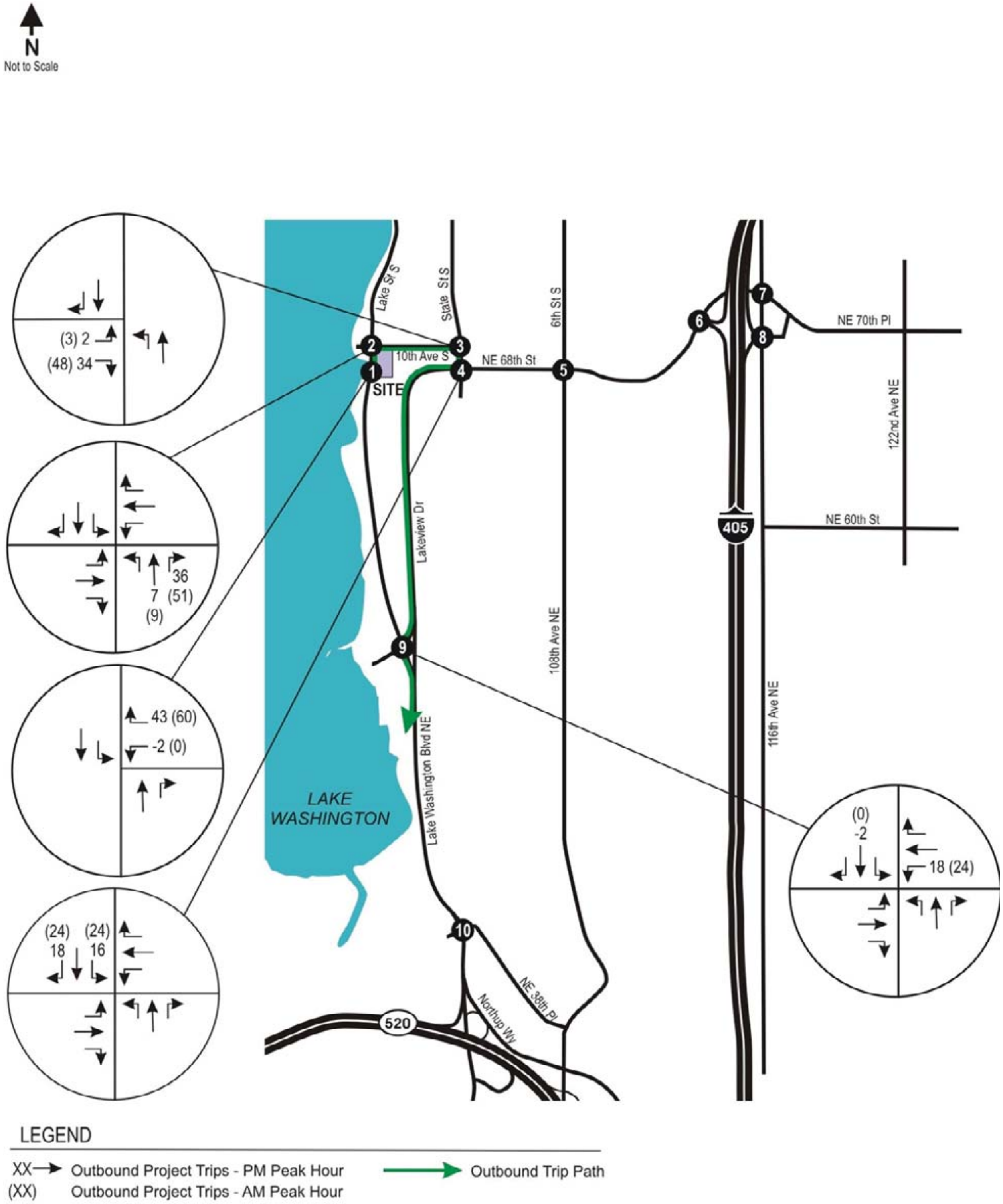

FIGURE 3.4-16

EGRESS SCENARIO 2 – OUTBOUND VEHICLES TRAVEL SOUTH VIA RIGHT TURNS

Table 3.4-18 2014-With-Project Level of Service Comparison of Potential Site Egress Patterns

	Egress Scenario 1 Outbound SB Trips Turn Left from Site to Lake Street S				Egress Scenario 2 Outbound SB Trips from Site Take Right Turns Around Block			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	LOS[1]	Delay[2]	LOS	Delay	LOS	Delay	LOS	Delay
Unsignalized Intersections [3]								
1. Lake St S/Site Driveway								
Westbound movement	C	20.9	D	26.9	C	10.2	C	16.5
2. Lake Street S/10th Ave S								
Eastbound movement	D	30.4	D	32.3	D	31.0	D	32.9
Westbound movement	**E**	**39.2**	**E**	**39.8**	**E**	**40.3**	**E**	**40.5**
3. State Street S/10th Ave S								
Eastbound movement	B	13.8	**E**	**36.3**	B	14.1	**E**	**35.8**
Signalized Intersections [4]								
4. State St S / NE 68th St	B	18.9	C	28.8	B	18.6	C	28.6
9. Lake Washington Blvd / Lakeview Drive	D	46.7	C	22.4	D	44.9	C	22.5
Project Trips on 10th Ave S	31		27		55		45	

Source: Heffron Transportation, 2012
1. Level of Service.
2. Average seconds of delay per vehicle.
3. For unsignalized intersections, level of service is based upon the average delay for the stop-controlled and permitted left-turn movements, because they experience the highest delay.
4. For signalized intersections, level of service is based upon average delay for all intersection movements.
5. LOS E and LOS F intersection levels of service and average delay are highlighted.

Table 3.4-19 Proportional Shares at LOS E and LOS F Intersections – Egress Scenarios

	Egress Scenario 1				Egress Scenario 2			
Intersection	*LOS with Project*	*Project Propor-tional Share [1]*	*Thresh-old [2]*	*Exceeds thresh-old?*	*LOS with Project*	*Project Propor-tional Share [1]*	*Thresh-old [2]*	*Exceeds thresh-old?*
2. Lake Street S/ 10th Avenue S	E	1.97%	15%	No	E	2.40%	15%	No
3. State Street S/ 10th Avenue S	E	2.62%	15%	No	E	4.72%	15%	No

1. Source: Heffron Transportation, June 2012
2. Source: City of Kirkland, Transportation Impact Analysis Guidelines, February 2004

Traffic Safety

Historical collision data in the site vicinity do not indicate any unusual safety concerns and the addition of project-generated traffic is not expect to substantially change overall safety conditions. The project is expected to add vehicle trips to the surrounding street network, which could increase the potential for conflicts. High average delays at stop-controlled intersections projected to operate at LOS E or F could also result in drivers on the stop-controlled approaches taking shorter gaps to cross or enter the major street, which could increase the potential for vehicle conflicts. However, as described previously, it is likely that as background traffic increases, more drivers would choose “right-turn” routes to and from the site that would have lower delays and be more predictable, so high future average delays at these intersections may not be realized. Overall, the project is not expected to result in significant adverse impact to traffic safety.

Transit

Although the analysis conducted for this Draft EIS conservatively assumes that all project-generated trips would occur by vehicle, the project could generate some transit trips as well. The site is served by transit routes along State Street that can accommodate any transit demand generated by the project. The project is not expected to result in significant adverse impacts to transit facilities or operations.

Non-Motorized Transportation

Although the analysis conducted for this Draft EIS conservatively assumes that all project-generated trips would occur by vehicle, it is expected that the project would generate some pedestrian and bicycle trips. As presented earlier in Table 3.4-1, all roadways in the project study area have sidewalks to accommodate pedestrians, and most also have marked bicycle lanes. A marked and signed crosswalk with flags is located on Lake Street S just south of 10th Avenue S. Any additional pedestrian or bicycle trips generated by the project would be accommodated by the non-motorized infrastructure that is in place within the study area.

Pedestrian counts conducted during the AM and PM peak hours indicate that the majority of pedestrians walk along Lake Street S/Lake Washington Boulevard on the west (Lake Washington) side of the street. However, pedestrians were also observed walking along the east side of the street. Pedestrians were also observed regularly crossing Lake Street S/Lake Washington Boulevard at the 10th Avenue S crosswalk. Bicycle travel patterns were consistent with the vehicle commute patterns on Lake Street S/Lake Washington Boulevard, with higher volumes traveling southbound in the AM peak hour and northbound during the PM peak hour.

Increased vehicle trips into and out of the site driveway that would result from the project also increase the potential for conflict with pedestrians and bicyclists who cross the driveway. However, the project would be required to meet City design standards to maintain adequate sight distance for vehicles departing the driveway. As described earlier, sight distance at the project site exceeds 400 feet in each direction. Outbound drivers would be able to see pedestrians and bicyclists approaching the driveway, and would be required to yield to them, just as they are required to do at all other driveways in the city. Because high levels of pedestrian and bicycle activity exist in the area, it is expected that drivers traveling into and out of the site would be aware of the need to watch for and yield to pedestrians and bicyclists. However, to further emphasize this, additional signage could be provided at the project driveway. The project is not expected to result in significant adverse impacts to non-motorized transportation operations or facilities.

Parking Demand and Supply

Parking demand for the proposed development was estimated using standard rates and equations published by the Institute of Transportation Engineers in *Parking Generation*.[13] The equation for Low/Mid-Rise Apartment (Land Use Code 221) was applied to the residential component of the project and results in an estimated peak parking demand of 176 vehicles. To provide additional background for the parking demand estimates, household vehicle ownership rates for the site area from the *Journey-to-Work Surveys* conducted as part of the *2000 Census* (the most recent data available) were reviewed. Census tracts 225.00 and 227.01, the two tracts that surround the site, were examined.[14] These data indicate renter-occupied units in the area averaged between 1.2 and 1.4 vehicles per unit. Based upon this range, the residential portion of the project could generate a peak demand of 172 to 201 vehicles. The Office Building (Land Use Code 701) suburban equation was applied to the general office component and the Medical Office Building (Land Use Code 720) equation was applied to the medical office component. The two office uses are projected to generate a combined peak demand of 21 vehicles.

The peak parking demand for each of the project components would not occur simultaneously. For example, peak parking demand for residential uses occurs overnight while peak parking demand for offices occurs mid-morning. Therefore, hourly parking demand accumulation percentages published in *Parking Generation* were applied to the peak parking demand estimates for each project component to determine the anticipated combined peak parking demand for the entire project. Figure 3.4-17 shows the projected weekday parking demand by time of day for the proposed residential and commercial uses. Figure 3.4-18 shows the projected weekday parking demand by time of day for the combined uses; the proposed parking supply is also shown. Based these figures, the combined peak parking demand for the project is estimated at 176 vehicles and is expected to occur overnight between midnight and 6:00 A.M. If residential parking and commercial parking is separated (not shared within the building), the total demand is estimated at 197 vehicles (176 for the residential component and 21 vehicles for the commercial component). If the higher residential rates derived from the 2000 Census data are applied, the total project demand could be up to 222 vehicles (201 for the residential component and 21 for the commercial spaces).

The project proposes to provide 316 parking spaces. Based on the analysis described above and the parking demand estimates presented, the proposed parking supply of 316 spaces is expected to adequately accommodate the combined peak demand from residents and the proposed commercial uses.

[13] Institute of Transportation Engineers, Parking Demand, 4th Edition, 2010
[14] Puget Sound Regional Council (PSRC), Journey-to-Work data from 2000 U.S. Census data.

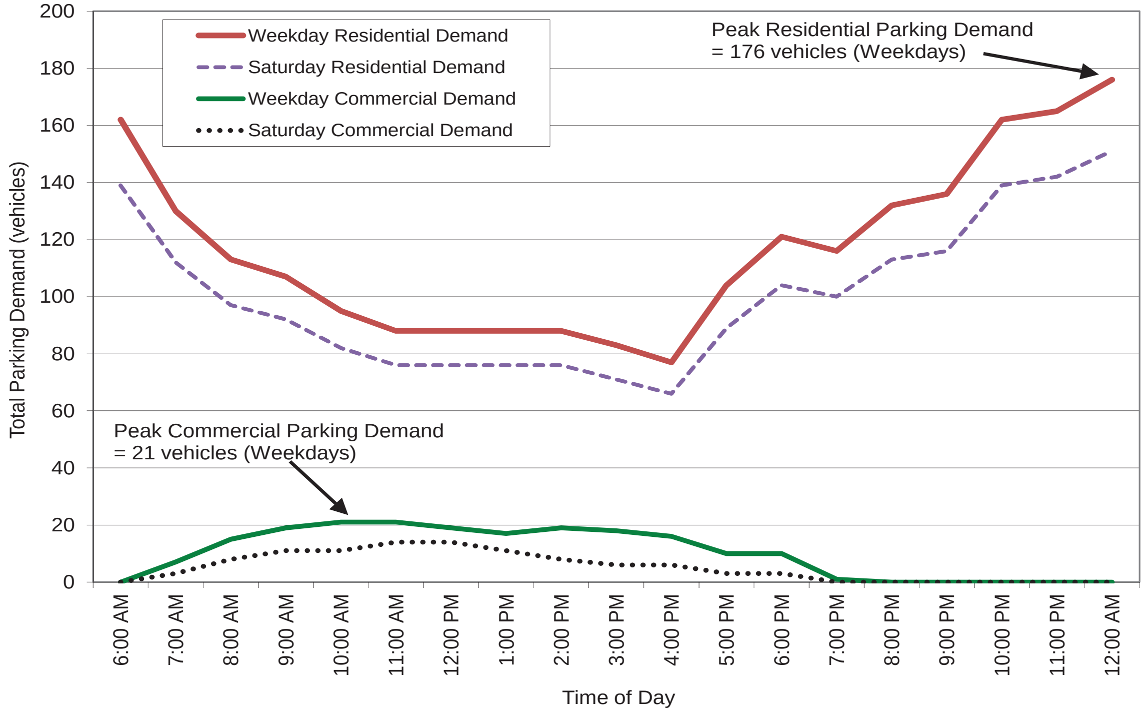

FIGURE 3.4-17

PARKING DEMAND BY PROPOSED LAND USE TYPE – WEEKDAYS AND SATURDAYS

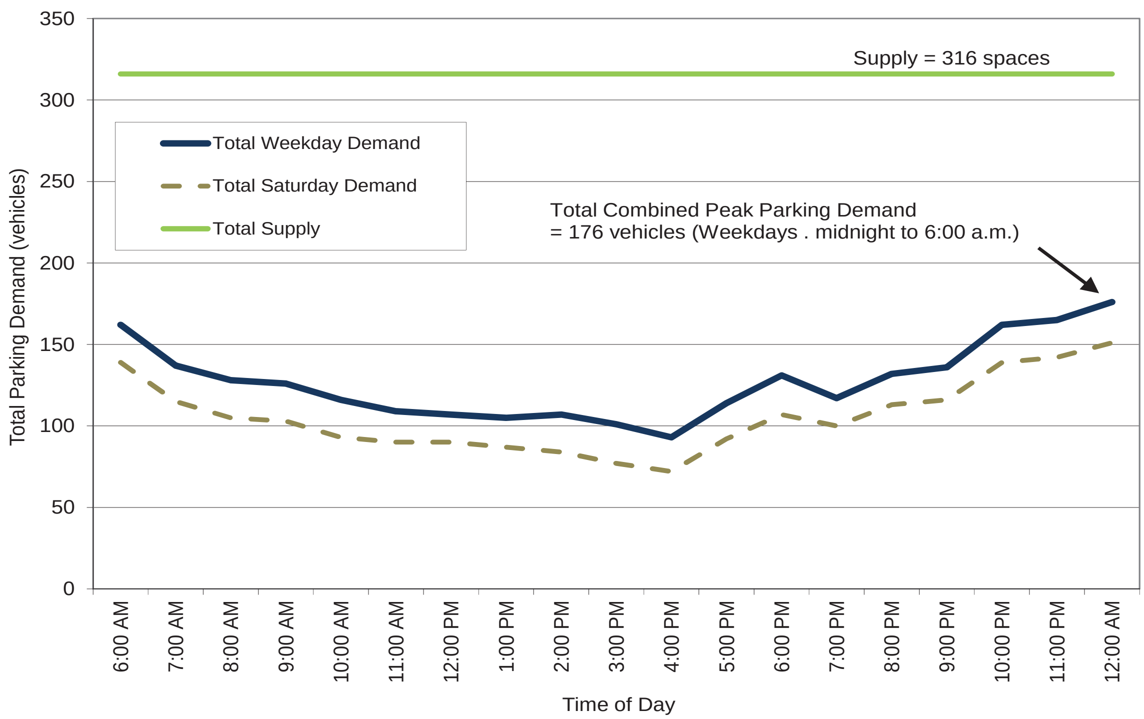

FIGURE 3.4-18

COMBINED PARKING DEMAND – WEEKDAYS AND SATURDAYS

Kirkland Zoning Code (Chapter 40.10) requires 1.7 parking spaces per multifamily dwelling unit, 1 space per 300 square feet of general office space, and 1 space per 200 square feet of medical office space. The City requirement for guest parking is determined on a case-by-case basis, and can be up to 0.5 spaces per unit. Smaller developments typically require the highest rate. The City has determined that the proposed 0.3 spaces per unit (at 43 guest parking spaces) is sufficient, given the proposed size of the development and parking lot layout.[15] Table 3.4-20 summarizes the parking spaces needed for the proposed project based upon these requirements, which results in a required minimum supply of 313 spaces. The proposed 316 spaces exceed the City's minimum requirement by 3 spaces.

Table 3.4-20 City Parking Requirements for Proposed Project

Land Use/Parking Type	*Size*	*Parking Requirement per Unit*	*Parking Spaces Required*
Multifamily Residential	143 units	1.7 spaces per unit	244
Residential Guest	143 units	0.3 space per unit	43
Medical Office	3,000 sf	1 space per 200 sf	15
General Office	3,200 sf	1 space per 300 sf	11
		TOTAL	**313**

The proposed parking supply exceeds the City's minimum requirements, and time-of-day parking demand analysis indicates that the proposed supply would exceed the maximum expected combined parking demand for the different uses. Therefore, no significant parking impacts are expected to result from the proposed project. However, as public on-street parking is available adjacent to the site, it is possible that some parking demand generated by the office uses or by visitors to the site could also occur at public on-street spaces. In addition, the commercial parking spaces could potentially be made available for residents and guests in the evenings and/or weekends, depending on the types of businesses that occupy the commercial space; residential parking could also be made available for commercial use during weekdays.

Transportation Concurrency

The City has adopted a Concurrency Management System under Title 25 of the Kirkland Municipal Code. Concurrency analysis considers the effects of proposed land use on the transportation system at the time of project completion, which is a legal requirement to ensure that the City has funding secured in its 6-year Capital Improvement Plan for transportation projects needed to support development planned through that time period. Under the Concurrency Management System, the City has assessed the transportation impacts of planned future land use defined in the City's Comprehensive Plan according to adopted level of service thresholds. For proposed new development that triggers SEPA review a Concurrency Management application must be completed, which the City reviews and determines if the new trips that would be generated by the project would not exceed the Concurrency Level of Service (LOS) thresholds:

[15] Guest parking space requirements for the proposed development provided by Teresa Swan, Senior Planner, City of Kirkland, June 2012.

1. No designated concurrency intersection can exceed a volume-to-capacity ratio (V/C ratio) of 1.40.

2. The subarea V/C ratio cannot exceed the subarea V/C ratio standards:

   - Northeast subarea: 0.90
   - Northwest subarea: 0.94
   - East subarea: 0.92
   - Southwest subarea: 1.07

Future traffic volumes at the year of build-out (2014 for this proposed project) are used by the City to test for Concurrency LOS. These include background traffic growth, approved pipeline developments that would exist by 2014, and the project-generated traffic. If these combined volumes do not cause V/C ratios to exceed the levels described above, the project is considered to "pass" the concurrency test. This is different and separate from the level of service analysis applied to assess SEPA impacts.

Under the City's Road Impact Fee Program, new development pays impact fees to the City, which comprises their contribution toward future capacity projects needed to keep the City's designated concurrency intersections operating within their adopted standards. All signalized intersections analyzed in this Draft EIS are designated concurrency intersections.[16] As described earlier and shown in Table 3.4-11, four concurrency intersections are projected to operate at LOS E or F in 2014 with or without the proposed project. Although the percent of project-generated trips through these intersections would not meet the City's significance threshold for requiring the project to provide separate mitigation, the project applicant would pay impact fees to support the citywide Road Impact Fee Program.

A Concurrency Management application for the proposed project was submitted to the City in fall 2010. The original proposal, as reflected in the Concurrency Management Application was larger than the current proposal (164 apartments and about 9,000 sf of commercial space, compared to the existing proposal of 143 apartments and 6,200 sf of commercial space). The City issued notification (dated November 29, 2010 and revised on April 7, 2011) that the proposed project had passed concurrency—since the revised proposal is smaller and would generate fewer trips than the original proposal, a new concurrency test was not required . The City's concurrency determination was appealed, but the City's determination was upheld by the Hearing Examiner in Findings and Decision that was issued on December 2, 2011.

Sensitivity of Transportation Impacts to Alternative Development Scenarios

As discussed in the previous sections, the transportation impacts expected to result from the proposed project do not exceed the City's adopted thresholds for significance. However, additional assessment was completed to evaluate the sensitivity of potential transportation impacts to alternative development scenarios described in Chapter 3.3 of this Draft EIS. The following sections describe the effect on vehicle trip generation and levels of service expected to result if (1) a lower level of residential development were built, or (2) the commercial space was used for retail instead of general office and medical office.

[16] City of Kirkland, Comprehensive Plan – Transportation Element, updated May 2009.

Lower Residential Development Levels

Table 3.4-21 summarizes the net new trips expected to result if the new development consisted of 143 multifamily units (proposal), 110 multifamily units, 100 multifamily units, or 90 multifamily units. For each scenario, the office space was assumed to be the same as proposed (3,200-sf of general office and 3,000-sf of medical office). As would be expected, lower levels of net new trips would be expected to result from lower development levels.

Table 3.4-21 Net New Trips– Alternate Multifamily Development Scenarios

	Net New Vehicle Trips						
		AM Peak Hour			PM Peak Hour		
Development Scenario	*Daily*	*In*	*Out*	*Total*	*In*	*Out*	*Total*
143 MF units + 6,200 sf general and medical office (proposal)	1,050	24	60	84	62	41	103
110 MF units + 6,200 sf general and medical office	850	21	47	68	51	34	85
100 MF units + 6,200 sf general and medical office	790	20	43	63	47	33	80
90 MF units + 6,200 sf general and medical office	730	19	39	58	44	30	74

Source: Heffron Transportation, June 2012.

As shown in Table 3.4-22, the lower levels of net new trips would have small incremental effects on intersection delays but no effect on levels of service. This is because the total project-generated trips under all four scenarios represent a small proportion of each intersection's capacity (as shown previously in Table 3.4-10). The traffic reductions resulting from incrementally fewer residential units would not substantially change the results. As shown, the scenarios with fewer apartments would result in slightly lower levels of average delay (about 0 to 2 seconds difference between the 143-unit and 90-unit scenarios) but would not change the overall expected levels of service. It should be noted, however, that all of the Alternate Development Scenarios would be expected to increase study-area intersection delay by 0 to3 seconds compared to without-project conditions at all study intersections except the stop-controlled Lake Street S intersections (shown previously in Table 3.4-11). At Lake Street S/10th Avenue S, the development scenarios with fewer residential units would still be expected to increase vehicle trips at the westbound left-turn movement. This movement is forecast to operate at LOS E during peak hours with any of the alternate development scenarios.

Table 3.4-22 2014-With-Project Levels of Service – Alternative Development Scenarios

	143 MF Units PM Peak Hour		110 MF Units PM Peak Hour		100 MF Units PM Peak Hour		90 MF Units PM Peak Hour	
	LOS[1]	Delay[2]	LOS	Delay	LOS	Delay	LOS	Delay
Unsignalized Intersections [3]								
1. Lake Street S/ Site Driveway								
Westbound movement	D	26.9	D	25.3	D	25.3	C	24.9
Northbound movement	A	0.0	A	0.0	A	0.0	A	0.0
Southbound movement	A	0.8	A	0.7	A	0.7	A	0.6
2. Lake Street S/ 10th Avenue S								
Eastbound movement	D	32.3	D	32.1	D	32.1	D	32.0
Westbound movement	**E**	**39.8**	**E**	**38.3**	**E**	**37.1**	**E**	**36.9**
Northbound movement	A	0.2	A	0.2	A	0.2	A	0.2
Southbound movement	A	0.7	A	0.7	A	0.7	A	0.7
3. State Street S/ 10th Avenue S								
Eastbound movement	**E**	**36.3**	**E**	**36.2**	**E**	**36.0**	**E**	**36.0**
Northbound movement	A	1.1	A	1.1	A	1.1	A	1.1
Southbound movement	A	0.0	A	0.0	A	0.0	A	0.0
Signalized Intersections [4]								
4. State Street S/ NE 68th Street	C	28.8	C	28.7	C	28.6	C	28.6
5. 6th Street S/ 108th Avenue NE/ NE 68th Street	**E**	**68.3**	**E**	**68.0**	**E**	**67.9**	**E**	**67.8**
6. NE 72nd Place/ I-405 Southbound Ramps	**E**	**59.8**	**E**	**59.4**	**E**	**59.4**	**E**	**59.3**
7. 116th Avenue NE/ NE 70th Place	C	32.5	C	32.5	C	32.5	C	32.5
8. 116th Avenue NE/ I-405 Northbound Ramps	**F**	**86.2**	**F**	**85.7**	**F**	**85.7**	**F**	**85.8**
9. Lake Washington Blvd / Lakeview Drive	C	22.4	C	22.3	C	22.3	C	22.3
10. Lake Washington Blvd / NE 38th Place	**E**	**66.8**	**E**	**66.4**	**E**	**66.3**	**E**	**66.1**

Source: Heffron Transportation, 2012
1. *Level of Service.*
2. *Average seconds of delay per vehicle.*
3. *For unsignalized intersections, level of service is based upon the average delay for the stop-controlled and permitted left-turn movements, because they experience the highest delay.*
4. *For signalized intersections, level of service is based upon average delay for all intersection movements.*
5. *LOS E and LOS F intersection levels of service and average delay are highlighted.*

Retail Development Instead of Office

Table 3.4-23 summarizes the net new trips expected to result if the new development consisted of 6,200-sf of retail space instead of the general office (3,200-sf) and medical-dental office (3,000-sf) assumed for the prior analyses. For this scenario, the number of multifamily residential units was assumed to be the same as proposed (143 units). As shown, the expected net new daily and PM peak hour driveway trips would be slightly higher with retail development when compared to the forecasts for the project with office. The expected net new AM peak hour driveway trips would be slightly lower (since most retail spaces are not open during the morning commute hours). It is important to note that a portion of all retail driveway trips can be expected to come from traffic that is already passing the site (known as pass-by trips) and would not be new to the local roadways or intersections. Average rates published for Shopping Centers in ITE's *Trip Generation Handbook*[17] indicate that about 34% of weekday PM peak hour driveway trips may be pass-by trips that are already on the roads passing the site. After accounting for the retail pass-by trips, this scenario would generate about the same level of traffic as the scenario assumed to contain the office uses. This scenario is also not expected to changes the results related to intersection operations or levels of service.

Table 3.4-23 Net New Trips– Alternate Retail Scenario

	Net New Vehicle Trips						
		AM Peak Hour			PM Peak Hour		
Development Scenario	*Daily*	*In*	*Out*	*Total*	*In*	*Out*	*Total*
143 MF units + 6,200-sf general and medical office (proposal)	1,050	24	60	84	62	41	103
143 MF units + 6,200-sf retail	1,170	18	60	78	69	42	111

Source: Heffron Transportation, June 2012.

Based upon ITE parking demand rates,[18] the retail development within this scenario would be expected to generate a lower level of parking demand than office development during weekdays, and a higher level of parking demand than office development on Saturdays. However, the peak demand of the combined residential and retail development would still be expected to occur between midnight and 6:00 A.M. when the retail development is closed. Therefore, based upon ITE parking demand rates, the proposed parking supply would accommodate retail within the commercial space. Kirkland Zoning Code (Chapter 40.10) requires 1 parking space per 300 square feet of retail development, which would result in a minimum requirement of 21 parking spaces to support 6,200-sf of retail. This is less than the 26 parking spaces required to support the proposed office development, as summarized previously in Table 3.4-20.

[17] ITE, 2nd Edition, June 2004.
[18] ITE, 4th Edition, 2010.

3.4.3 Mitigating Measures

Following are mitigation measures recommended for the proposed project.

Applicable Regulations and Commitments

Road Impact Fee

The City of Kirkland has adopted a Road Impact Fee Program that outlines the contribution that must be paid for new development, based on land use type, toward citywide roadway capacity improvement projects that have been planned to support concurrency. Table 3.4-21 summarizes the estimated impact fee for the proposed project, which is estimated to be $378,275.

Table 3.4-24 Estimated Road Impact Fee

Land Use	*Size*	*Impact Fee Per Unit* [1]	*Total Impact Fee*
Proposed Project			
Multifamily Residential	143 units	$2,242 per unit	$ 320,606
General Office	3,200 sf	$7.40 per sf	23,680
Medical Office	3,000 sf	$14.49 per sf	43,470
		Sub-total	$ 387,756
Existing Use (credit)			
Retail (Shopping Center)	2,114 sf	$4.48 per sf	– $ 9,471
		TOTAL	**$ 378,275**

1. Source: City of Kirkland, Transportation Impact Fee Schedule as of September 1, 2010, updated September 22, 2010.

Frontage Improvements

As part of redevelopment, the project would provide frontage improvements as required by City development code. Frontage improvements would enhance the non-motorized facilities in the site vicinity.

Other Potential Mitigation Measures

Parking Management Strategies

The proposed parking supply meets the City's minimum requirements, and is expected to exceed the projected peak parking demand. Even so, it is possible that some parking demand generated by the by visitors to the office development or residential units could occur at public on-street spaces near the site. Since the on-site parking supply is expected to accommodate all parking demand generated by the project, the following parking management measures could be implemented to further encourage project-generated parking to occur on-site:

- Bundle parking with apartment leases (or condominium sales) to reduce the likelihood that residents will forego on-site parking and choose instead to park on the adjacent streets.
- Reserve parking spaces for the commercial uses and visitors in visible locations that are signed and easily accessible with no security gate.

- Provide signage that can be seen from the street indicating that visitor parking for commercial uses and residences is available inside the parking garage.
- Provide a kiosk in the common area that provides information on alternative transportation options.
- Implement a parking management plan in which commercial parking is available to residents and their visitors on weekday evenings and weekends when not in use, and provide signage to clarify the availability of the additional spaces.

3.4.4 Significant Unavoidable Adverse Impacts

Implementation of the proposed project would result in increased traffic volumes and delay at intersections near the site. However, the operational effects of the additional vehicles do not exceed the City's adopted thresholds for significance, and thus they would not be considered a significant unavoidable adverse impact.