Lake Washington High School (LWHS) Addition

Kirkland, WA

Transportation Impact Analysis

November 26, 2018

Prepared for:

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EXECUTIVE SUMMARY

This transportation impact analysis (TIA) has been prepared for the proposed 20-classroom addition to Lake Washington High School (LWHS) located at 12033 NE 80th Street in Kirkland, Washington.

Project Proposal. The existing school serves grades 9 through 12 with an enrollment of 1,541 students but the school is currently entitled for up to 1,727 students. Based on information from the Lake Washington School District, the proposed project would include an addition consisting of 20 new classrooms, an addition to the existing gymnasium, an expansion of the existing commons area, and the removal of the 10 existing portables from the school site. The proposed 20-classroom addition would increase the capacity of the school by 273 students resulting in a total future maximum capacity of 2,000 students.

Vehicular access to the school is currently provided at three locations; via the existing 120th Avenue NE / NE 80th Street signalized intersection, and via two stop-controlled driveways on NE 75th Street. Vehicular access will remain the same with the proposed addition. The project is planned to be completed prior to the start of school in Fall 2020.

A total of 510 parking stalls are currently provided on the LWHS site. The LWHS Addition project would include restoring the striped parking stalls that are currently occupied by portables and expansion of the existing surface parking lot on the northwest corner of the site as shown in Figure 2. A total of 530 parking stalls would be provided on-site with the proposed addition project.

Trip Generation. The proposed Lake Washington High School Addition (+273 students) is estimated to generate 800 new weekday daily trips with 227 new weekday AM peak hour trips (138 entering, 89 exiting), 131 new weekday afternoon peak hour trips (43 entering, 88 exiting), and 41 new weekday PM peak hour trips (19 entering, 22 exiting).

Transportation Concurrency. The City has determined the proposed LWHS Addition project meets the City's transportation concurrency requirements. A Concurrency Test Notice was issued on November 1, 2018.

Intersection Operations. Based on an analysis of 8 study intersections (including the 3 site accesses on NE 80th Street and NE 75th Street), all study intersections are anticipated to operate at LOS D or better in 2020 with the proposed project during the AM peak hour, afternoon peak hour, and PM peak hour with one exception; the 120th Avenue NE / NE 80th Street signalized intersection is anticipated to operate at LOS F with the proposed LWHS Addition during the weekday AM peak hour.

Parking Analysis. The future weekday peak parking demand with the LWHS Addition project is estimated to be 520 vehicles (0.26 vehicles per student X 2,000 future students). Therefore, the proposed future parking supply of 530 stalls would be expected to accommodate the typical weekday peak demand at the school.

Mitigation

Concurrency. The project was evaluated for transportation concurrency by the City of Kirkland in October 2018. Based on the results, the City has determined the projects meets the City's transportation concurrency requirements. Therefore, no short-term transportation mitigation was required to obtain concurrency in the City of Kirkland.

SEPA Improvements. Based on the results of the LOS analysis and the proportional share calculations at the study intersections, the installation of improvements under SEPA is not required.

Transportation Impact Fees. Transportation mitigation required by the City of Kirkland is payment of an impact fee based on the project's proposed land use. Based on the currently adopted cost per trip ($311.25 per high school student as of January 1, 2018), the proposed LWHS Addition project results in a preliminary transportation impact fee of $84,971 (273 additional students X $311.25 per student). The cost per trip is subject to change and final impact fee calculations will be conducted at the time of building permit issuance.

INTRODUCTION

This transportation impact analysis (TIA) has been prepared for the proposed addition to Lake Washington High School (LWHS) located at 12033 NE 80th Street in Kirkland, Washington. A vicinity map showing the location of the site and the surrounding area is included in Figure 1.

Project Description

The existing Lake Washington High School (LWHS) is located at 12033 NE 80th Street as illustrated in the Figure 1 site vicinity map. The existing school serves grades 9 through 12 with an enrollment of 1,541 students but the school is currently entitled for up to 1,727 students. Based on information from the Lake Washington School District, the proposed project would include an addition consisting of 20 new classrooms, an addition to the existing gymnasium, an expansion of the existing commons area, and the removal of the 10 existing portables from the school site. The proposed 20-classroom addition would increase the capacity of the school by 273 students resulting in a total future maximum capacity of 2,000 students.

Vehicular access to the school is currently provided at three locations; via the existing 120th Avenue NE / NE 80th Street signalized intersection, and via two stop-controlled driveways on NE 75th Street. Vehicular access will remain the same with the proposed addition. The project is planned to be completed prior to the start of school in Fall 2020. A preliminary site plan is shown in Figure 2.

A total of 510 parking stalls are currently provided on the LWHS site. The addition project would include restoring the striped parking stalls that are currently occupied by portables and expansion of the existing surface parking lot on the northwest corner of the site as shown in Figure 2. A total of 530 parking stalls would be provided on-site with the proposed Addition project.

Project Approach

The report is structured in accordance with the City of Kirkland's *Traffic Impact Analysis Guidelines* (revised August 2014), in documenting the evaluation of traffic impacts and recommended mitigation measures. Specific scope items to be included were also discussed and confirmed by City staff. To analyze the traffic impacts from the proposed LWHS addition, the following tasks were undertaken:

- Assessment of existing conditions through field reconnaissance and review of existing planning documents.
- Described and assessed existing transportation conditions in the area, including existing traffic volumes, level of service, collision history, public transportation, and non-motorized facilities;
- Documented the City's planned transportation improvements in the site vicinity;
- Estimated trip generation and documented trip distribution and assignment of AM, afternoon and PM peak hour project traffic;
- Documented the concurrency test results for the development;
- Evaluated intersection proportional shares based on City guidelines;
- Forecasted future 2020 no action and with-project traffic volumes.

- Analyzed year 2020 AM, afternoon, and PM peak hour LOS at the study intersections and site driveways.
- Assessed parking supply and demand.
- Identified mitigation to the City of Kirkland.

Primary Data and Information Sources

- City of Kirkland *Traffic Impact Analysis Guidelines*, Revised August 2014.
- AM, afternoon, and PM peak period traffic counts, IDAX, 2018.
- Average Daily Traffic Volumes; source: City of Kirkland.
- *Highway Capacity Manual (HCM),* TRB, 6th Edition, 2016.
- Washington State Department of Transportation 2015-2017 collision data.
- Metro/King County Website, November 2018.
- City of Kirkland *2019-2024 Capital Improvement Program (CIP).*
- City of Kirkland *Transportation Impact Fees,* effective January 1, 2018.

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Figure 1: Project Site Vicinity

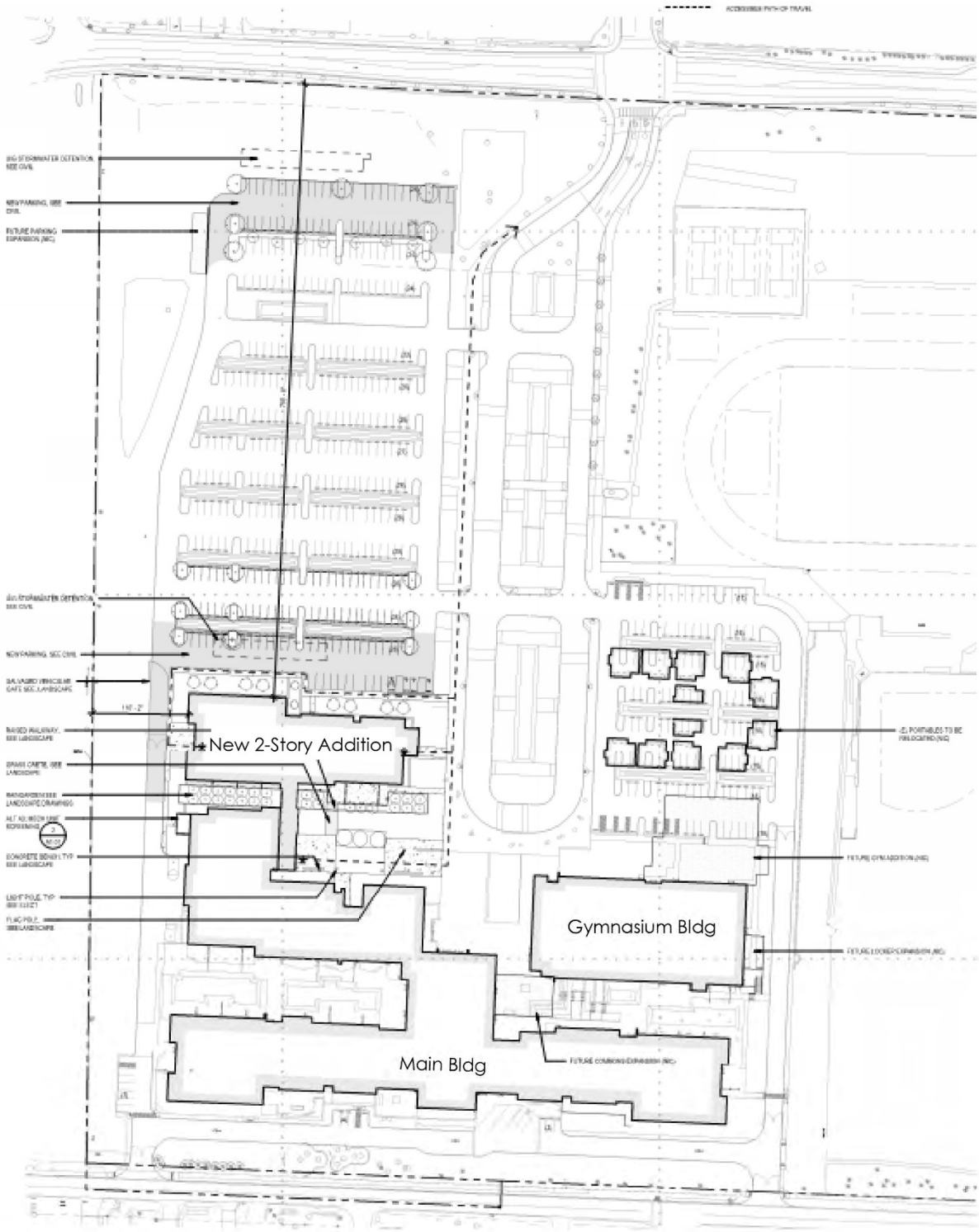

Figure 2: Preliminary Site Plan

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EXISTING CONDITIONS

This section describes existing transportation system conditions in the study area, including an inventory of existing roadways, existing traffic volumes, intersection levels of service (LOS), collision history, public transportation services, and non-motorized transportation facilities.

Roadway Network

Table 1 describes the existing characteristics of the streets that would be used as primary routes to and from the site. Roadway characteristics are described in terms of orientation, arterial classification, number of lanes, posted speed limits, parking, pedestrian facilities, and bicycle facilities. The relationship of these roadways to the project site is shown in Figure 1.

Table 1
Existing Study Area Roadway Network

Roadway	Orientation	Arterial Classification	# of Lanes	Posted Speed Limit (mph)	Parking	Sidewalks	Bicycle Facilities
NE 80th Street	East/west	Collector Street	2	25	No	Both sides	Yes
NE 85th Street	East/west	Principal Arterial	5	35	No	Both sides	No
120th Ave NE	North/south	Collector Street	2	25	Both sides	Both sides	No
116th Ave NE	North/south	Collector Street	2	25	No	Intermittent east side	Yes
NE 75th Street	East/west	Local Street	2	25	Intermittent on south side	North side	No

Public Transportation Services

The Lake Washington School District does not provide school bus transportation to LWHS. King County-Metro Transit provides public transportation services in the project vicinity. Transit stops for routes 238 and 277 are located on NE 80th Street at 120th Ave NE and on 116th Ave NE at NE 75th Street. Additionally, a transit stop for route 893 is located on 120th Ave NE north of NE 80th Street.

Route 238 offers weekday and weekend service between the Woodinville Park&Ride, UW Bothell, Totem Lake Transit Center, Houghton Park & Ride, and the Kirkland Transit Center. Weekday service runs from approximately 6:00 a.m. to 7:00 p.m. with approximate 30-minute headways.

Route 277 offers weekday service between Juanita and the University of Washington. Weekday service runs to UW from Juanita in the morning from approximately 6:00 a.m. to 9 a.m. and runs from UW to Juanita in the afternoon from approximately 3:00 p.m. to 6:00 p.m.

Route 893 offers weekday service between the Totem Lake Transit Center and Lake Washington High School (LWHS) in the City of Kirkland. There is one bus providing service in the morning between the Transit Center and LWHS and one bus providing service in the afternoon between LWHS and the Transit Center.

Non-Motorized Transportation Facilities

Pedestrian facilities in the study area include sidewalks on both sides of NE 80th Street, the west side of 122nd Ave NE along the school frontage, the north side of NE 75th Street, and the west side of 120th Ave NE. Marked crosswalks and curb ramps are also located on all legs at the signalized intersection of NE 80th Street/120th Ave NE which provides primary access to the LWHS site.

Designated bicycle lanes in the immediate vicinity of the project exist on both sides of NE 80th Street and both sides of 116th Ave NE.

Collision History

Collision records at the study intersections were reviewed for the most recent three-year period from January 1, 2015 to December 31, 2017. Collision data was provided by the Washington State Department of Transportation (WSDOT). The detailed collision data is included in Appendix A. Summaries of the total, yearly average, and collisions per million entering vehicles (MEV) at the study intersections are provided in Table 2.

Table 2
Collision Data Summary, January 1, 2015 to December 31, 2017

	Number of Collisions				
Study Intersections	2015 Collisions	2016 Collisions	2017 Collisions	Average Annual Collisions	Average Collisions / MEV[1]
1) NE 85th Street / 120th Ave NE	15	11	7	11.00	0.79
2) NE 80th Street / 120th Ave NE	0	2	3	1.67	0.36
3) NE 80th Street / 122nd Ave NE	1	0	2	1.00	0.32
4) NE 75th Street / 116th Ave NE	0	0	0	0.00	0.00
5) NE 75th Street / LWHS West Driveway	0	0	0	0.00	0.00
6) NE 75th Street / 120th Ave NE	0	0	0	0.00	0.00
7) NE 75th Street / LWHS East Driveway	0	0	0	0.00	0.00
8) NE 75th Street / 122nd Ave NE	0	0	0	0.00	0.00

1) MEV = Million Entering Vehicles.
Collision data was provided by City of Kirkland at all intersections except #8 and #9 where data was provided by WSDOT.

Intersection collision rates over 1.0 collision per MEV generally warrant further review to determine if any patterns exist. Based on the most recent 3 years of collision history provided by WSDOT, there are no study intersections with a collision per MEV rate greater than 1.0.

Additionally, based on a review of the collision history, there was one rear-end collision on NE 80th Street approximately 350 feet west of 120th Ave NE and there was one collision on NE 75th Street 165 feet west of 122nd Ave NE which involved a car turning into a ditch. There were no other collisions along the frontages of Lake Washington High School during the most recent 3 year period (2015 to 2017).

Existing Traffic Volumes

Year 2018 existing AM, afternoon, and PM peak hour traffic volumes at the study intersections were based on counts conducted by IDAX.

The weekday AM peak hour was determined based on the peak hour associated with student arrivals which typically occurs between 7:30 and 8:30 AM (assuming an 8:00 AM start time consistent with the current school). The weekday afternoon peak hour is the peak hour associated with student departures, which typically occurs between 2:45 and 3:45 PM (assuming a 2:50 PM dismissal time consistent with the current school). The weekday PM peak hour is assumed to be the peak hour of adjacent street traffic as defined by the Institute of Transportation Engineers (highest hour between 4:00 and 6:00 p.m.).

Figures 3-5 show the existing 2018 weekday AM, afternoon, and PM peak hour traffic volumes at the study intersections.

Historical average daily traffic volumes on streets in the vicinity were provided by the City of Kirkland. Table 3 summarizes the historical traffic counts on NE 85th Street, NE 80th Street and 120th Ave NE in the project site vicinity.

Table 3
Existing Daily Traffic Volumes

Count Location	2017	2015	2013	2011	2009
NE 85th Street					
West of 120th Ave NE	43,018	41,026	44,334	46,098	44,454
East of 124th Ave NE	32,593	28,550	33,589	36,181	36,493
NE 80th Street					
East of 120th Ave NE	6,983	9,718	7,867	6,251	6,572
West of 120th Ave NE	6,486	7,695	7,448	5,320	5,968
120th Avenue NE					
South of NE 85th St	6,264	8,197	6,320	4,480	5,116
North of NE 80th St	4,939	6,402	5,613	4,425	4,062
South of NE 80th St	1,298	2,963	3,069	2,316	3,459

Source: City of Kirkland Public Works Department

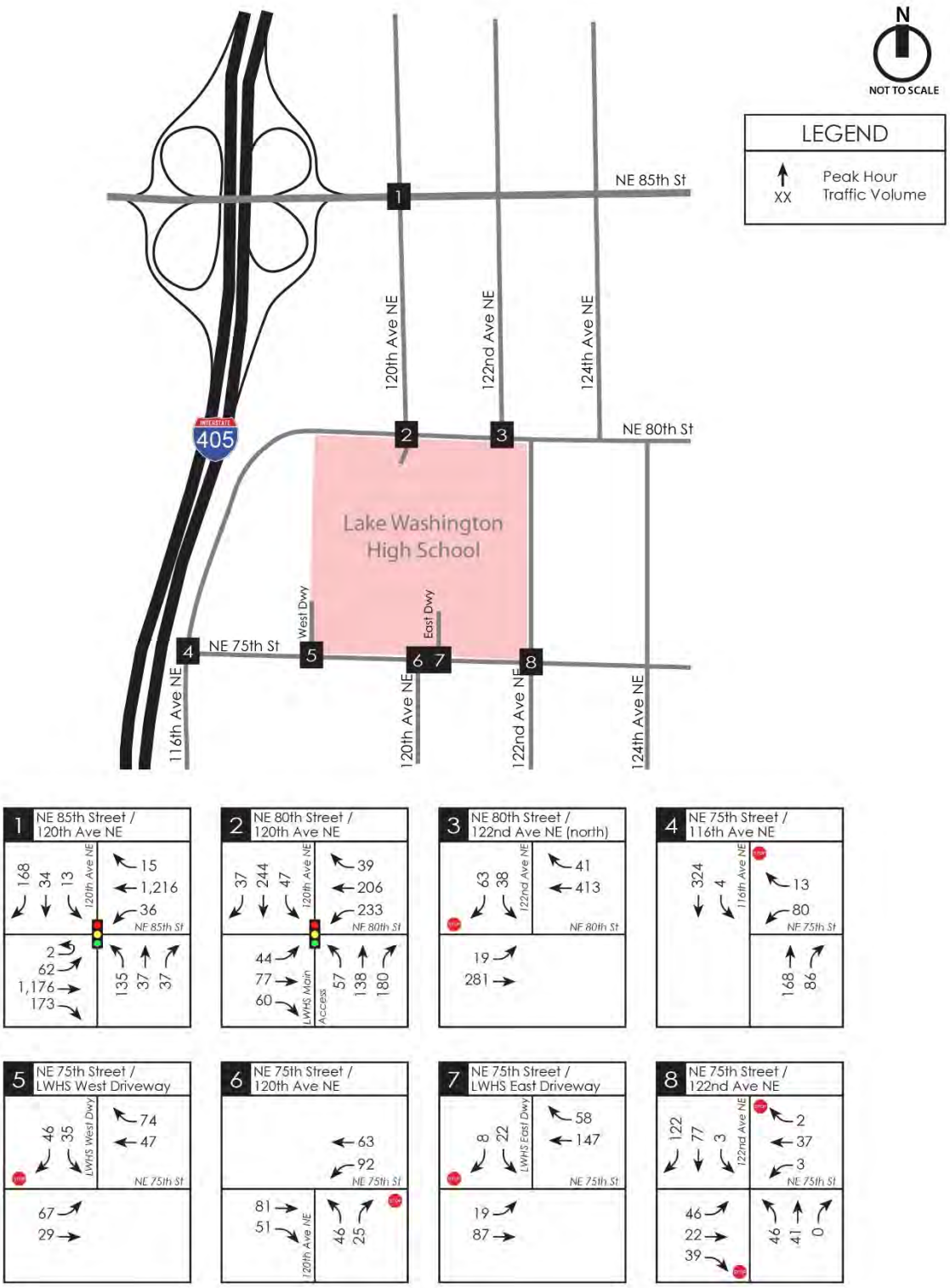


Figure 3: 2018 Existing AM Peak Hour Traffic Volumes

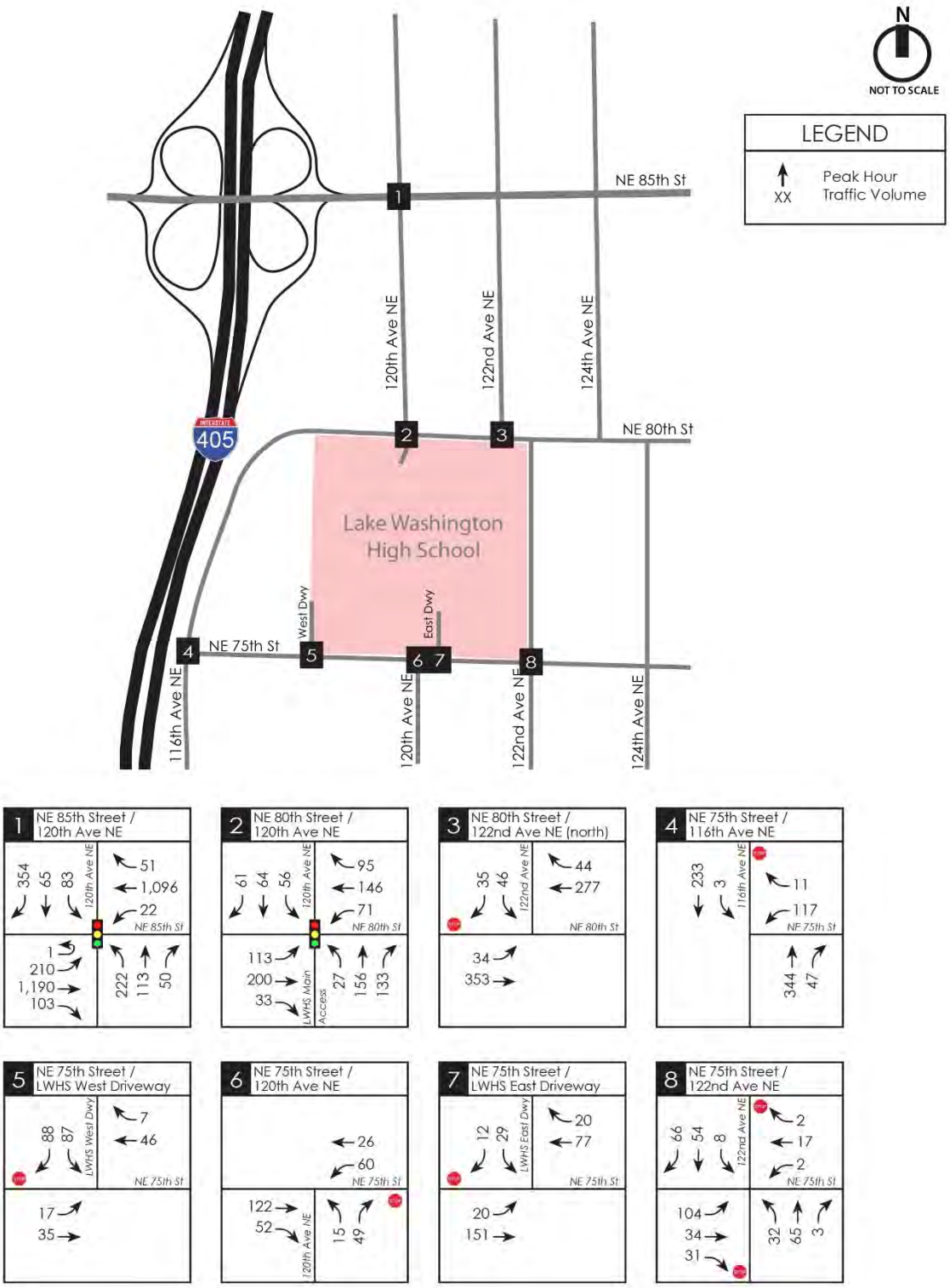


Figure 4: 2018 Existing Afternoon Peak Hour Traffic Volumes

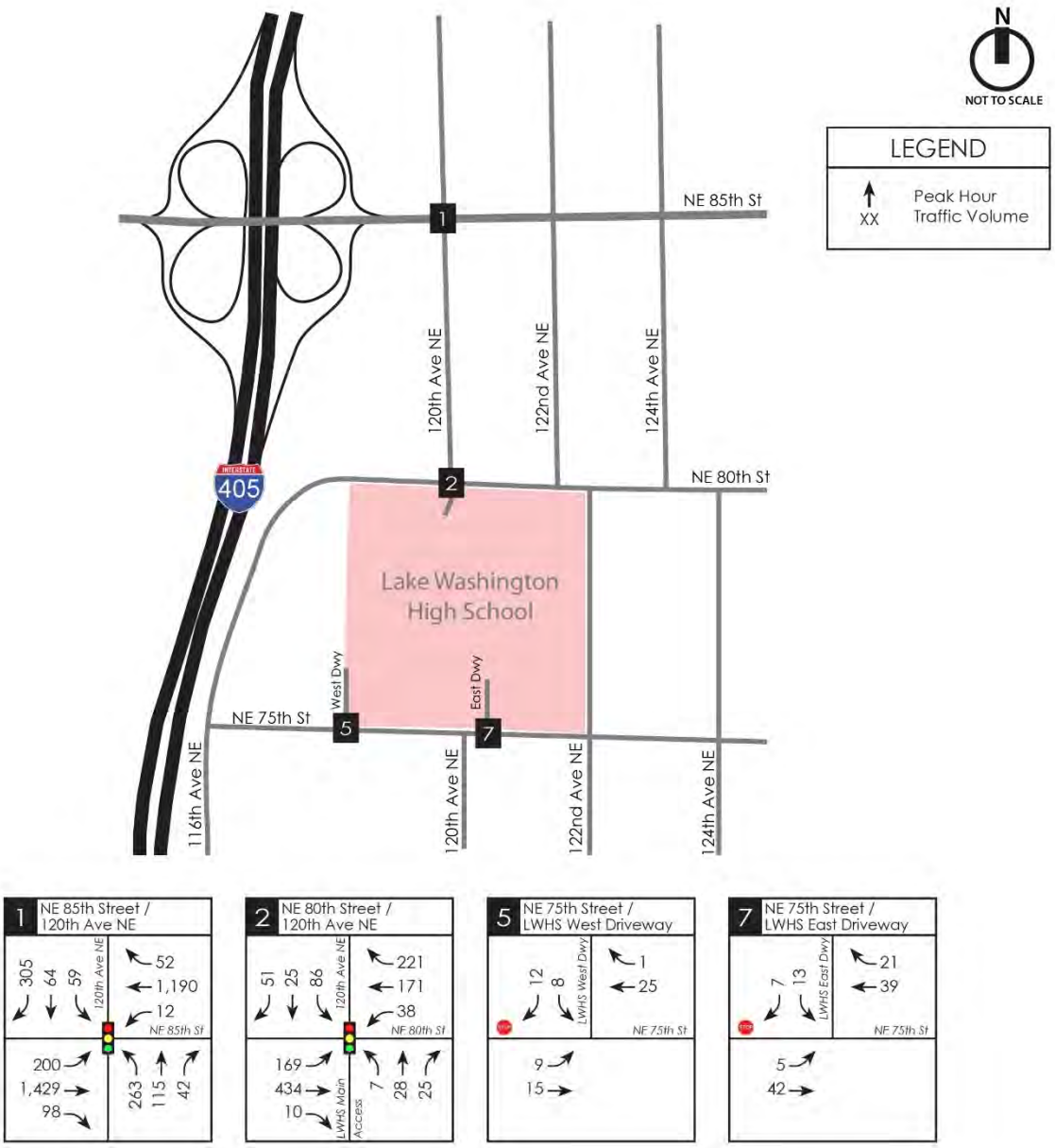


Figure 5: 2018 Existing PM Peak Hour Traffic Volumes

Intersection Levels of Service

An existing level of service (LOS) analysis was conducted at the study intersections and existing site access driveways. LOS generally refers to the degree of congestion on a roadway or intersection. It is a measure of vehicle operating speed, travel time, travel delays, and driving comfort. A letter scale from A to F generally describes intersection LOS. At signalized intersections, LOS A represents free-flow conditions (motorists experience little or no delays), and LOS F represents forced-flow conditions where motorists experience an average delay in excess of 80 seconds per vehicle.

The LOS reported for signalized intersections, roundabouts, and all-way stop controlled intersections represents the average control delay (sec/veh) and can be reported for the overall intersection, for each approach, and for each lane group or movement (additional v/c ratio criteria apply to lane group or movement LOS only).

The LOS reported at two-way stop-controlled intersections is based on the average control delay and can be reported for each controlled minor approach, controlled minor lane group, and controlled major-street movement (additional v/c ratio criteria apply to lane group or movement LOS only).

Table 4 outlines the current HCM LOS criteria for signalized and unsignalized intersections based on these methodologies.

Table 4
LOS Criteria for Signalized and Unsignalized Intersections[1]

SIGNALIZED INTERSECTIONS			UNSIGNALIZED INTERSECTIONS		
	LOS by Volume-to Capacity (V/C) Ratio[2]			LOS by Volume-to Capacity (V/C) Ratio[3]	
Control Delay (sec/veh)	≤ 1.0	> 1.0	Control Delay (sec/veh)	≤ 1.0	> 1.0
≤ 10	A	F	≤ 10	A	F
> 10 to ≤ 20	B	F	> 10 to ≤ 15	B	F
> 20 to ≤ 35	C	F	> 15 to ≤ 25	C	F
> 35 to ≤ 55	D	F	> 25 to ≤ 35	D	F
> 55 to ≤ 80	E	F	> 35 to ≤ 50	E	F
> 80	F	F	> 50	F	F

[1] Source: Highway Capacity Manual (HCM), Transportation Research Board, 6th Edition, 2016.

[2] For approach-based and intersection-wide assessments at signals, LOS is defined solely by control delay.

[3] For two-way stop-controlled intersections, the LOS criteria apply to each lane on a given approach and to each approach on the minor street. LOS is not calculated for major-street approaches or for the intersection as a whole at two-way stop-controlled intersections. For approach-based and intersection-wide assessments at all-way stop controlled intersections and roundabouts, LOS is solely defined by control delay.

Level of service calculations for intersections were based on methodology and procedures outlined in the 6th Edition of the *Highway Capacity Manual* using *Synchro 10.3* traffic analysis software. Existing signal timing used in the analysis was provided by the City of Kirkland.

The 2018 existing AM, afternoon, and PM peak hour LOS analysis results for the study intersections are summarized in Table 5, Table 6, and Table 7. The LOS worksheets are included in Appendix B.

Table 5
2018 Existing AM Peak Hour Level of Service Summary

	2018 Existing	
Study Intersection	LOS	Delay (sec)
Signalized Intersections		
1. NE 85th Street / 120th Ave NE	B	17.4
2. NE 80th Street / 120th Ave NE	C	26.1
Stop-Controlled Intersections		
3. NE 80th Street / 122nd Ave NE		
Eastbound Left-Turn	A	8.8
Southbound Shared Left-Right	C	20.3
4. NE 75th Street / 116th Ave NE		
Westbound shared Left-Right	C	17.8
Southbound Left-Turn	A	8.0
5. NE 75th Street / LWHS West Driveway		
Eastbound Left-Turn	A	8.2
Southbound shared Left-Right	B	14.5
6. NE 75th Street / 120th Ave NE		
Northbound Shared Left-Right	C	15.8
Westbound Left-Turn	A	8.2
5. NE 75th Street / LWHS East Driveway		
Eastbound Left-Turn	A	8.3
Southbound shared Left-Right	B	13.5
8. NE 75th Street / 122nd Ave NE		
Northbound Left-Turn	A	8.2
Eastbound Shared Left-Thru-Right	C	16.7
Westbound Shared Left-Thru-Right	C	15.9
Southbound Left-Turn	A	7.8

Table 6
2018 Existing Afternoon Peak Hour Level of Service Summary

Study Intersection	2018 Existing LOS	2018 Existing Delay (sec)
Signalized Intersections		
1. NE 85th Street / 120th Ave NE	D	36.8
2. NE 80th Street / 120th Ave NE	B	16.7
Stop-Controlled Intersections		
3. NE 80th Street / 122nd Ave NE		
Eastbound Left-Turn	A	8.3
Southbound Shared Left-Right	C	18.6
4. NE 75th Street / 116th Ave NE		
Westbound shared Left-Right	C	18.7
Southbound Left-Turn	A	8.3
5. NE 75th Street / LWHS West Driveway		
Eastbound Left-Turn	A	7.5
Southbound shared Left-Right	B	11.9
6. NE 75th Street / 120th Ave NE		
Northbound Shared Left-Right	C	15.9
Westbound Left-Turn	A	8.7
5. NE 75th Street / LWHS East Driveway		
Eastbound Left-Turn	A	8.1
Southbound shared Left-Right	B	14.4
8. NE 75th Street / 122nd Ave NE		
Northbound Left-Turn	A	7.8
Eastbound Shared Left-Thru-Right	C	16.9
Westbound Shared Left-Thru-Right	B	13.1
Southbound Left-Turn	A	7.6

Table 7
2018 Existing PM Peak Hour Level of Service Summary

Study Intersection	2018 Existing LOS	2018 Existing Delay (sec)
Signalized Intersections		
1. NE 85th Street / 120th Ave NE	D	36.1
2. NE 80th Street / 120th Ave NE	B	10.8
Stop-Controlled Intersections		
5. 116th Ave NE / West LWHS Driveway		
Eastbound Left-Turn	A	7.3
Southbound shared Left-Right	A	8.8
7. 116th Ave NE / East LWHS Driveway		
Eastbound Left-Turn	A	7.5
Southbound shared Left-Right	A	9.7

As shown in Tables 5-7, the signalized study intersections and individual movements at the stop-controlled intersections all currently operate at LOS D or better under existing conditions during the weekday AM, afternoon, and PM peak hours.

FUTURE CONDITIONS

Planned Transportation Improvements

A review of the City of Kirkland's Preliminary *2019-2024 Capital Improvement Program (CIP)* showed that there are no planned transportation improvement projects in the study area.

Project Trip Generation

To estimate trip generation for the proposed addition to Lake Washington High School, counts were collected at the existing school driveways on Tuesday September 18, 2018 and Thursday September 20, 2018 during the AM peak period (7:00 – 9:00 AM), afternoon (school) peak period (2:15 – 3:45 PM), and PM peak period (4:00 – 6:00 PM). A summary of the trip generation data collected at the existing driveways is included in Appendix C.

Based on the two-day average of the existing traffic volumes at the school driveways and the school enrollment of 1,541 students at the time of the counts, weekday AM peak hour, Afternoon peak hour, and PM peak hour trip rates were derived for the existing Lake Washington High School site. The resulting trip generation rates and directional splits from the trip generation study are summarized in Table 8 below. The trip rate calculations and vehicular count summaries are included in Appendix C.

Table 8
Existing Trip Generation Study Results

Time Period	Average Trip Rate (trips/student)[1]	Directional Split In	Directional Split Out
Daily	2.93	50%	50%
AM Peak Hour (7:15 – 8:15 AM)	0.83	61%	39%
Afternoon Peak Hour (varies)	0.48	33%	67%
PM Peak Hour (varies)	0.15	46%	54%

[1] Based on trip generation study completed at Lake Washington High School in September 2018.

As shown in Table 8, the average trip rate at LWHS is 0.83 trips per student during the AM peak hour, 0.48 trips per student during the Afternoon peak hour, and 0.15 trips per student during the PM peak hour.

As shown in Table 8, an estimated weekday daily trip rate was derived using the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition) for Land Use Code 530 (High School) by applying the ratio of peak hour Lake Washington High School trip rates to ITE trip rates.

To estimate the new trips generated by the proposed Addition project, the derived trip generation rates shown in Table 8 were applied to the net increase in student capacity associated with the proposed addition (273 students). The estimated new trips generated the proposed project during the weekday AM peak hour, Afternoon peak hour, and PM peak hour are summarized in Table 9. The detailed trip generation calculations are included in Appendix D.

Table 9
Trip Generation Summary

Weekday Time Period	Trip Rate (trips/student)	# of additional Students	New Trips Generated In	Out	Total
Daily	2.93	273	400	400	800
AM Peak Hour	0.83	273	138	89	227
Afternoon Peak Hour	0.48	273	43	88	131
PM Peak Hour	0.15	273	19	22	41

As shown in Table 9, the proposed Lake Washington High School Addition is estimated to generate 800 new weekday daily trips with 227 new weekday AM peak hour trips (138 entering, 89 exiting), 131 new weekday afternoon peak hour trips (43 entering, 88 exiting), and 41 new weekday PM peak hour trips (19 entering, 22 exiting).

Transportation Concurrency

The project was evaluated for transportation concurrency by the City of Kirkland in October 2018. Based on the results, the City has determined the projects meets the City's transportation concurrency requirements. A Concurrency Test Notice was issued for the project on November 1, 2018 and is included in Appendix E.

Project Trip Distribution and Assignment

The estimated distribution of new trips associated with the proposed Lake Washington High School Addition project was based on existing volumes at the school driveways and is estimated to be as follows:

- 30 percent to/from the north on 120th Avenue NE
- 10 percent to/from the west on NE 80th Street
- 30 percent to/from the east on NE 80th Street
- 15 percent to/from the west on NE 75th Street
- 15 percent to/from the east on NE 75th Street

The estimated distribution of inbound and outbound new peak hour trips to/from the school is illustrated graphically in Figure 6.

New trips associated with the proposed addition project were assigned to the existing site access driveways on NE 80th Street and NE 75th Street based on the distribution illustrated in Figure 6. Figures 7 to 9 illustrate the assignment of the project-generated traffic through the site access driveways and at the off-site study intersections during the weekday AM, afternoon, and PM peak hours.

Proportional Share Evaluation

Based upon the City of Kirkland's *Traffic Impact Analysis Guidelines* (August 2014), a detailed traffic analysis is required at intersections that have a proportional share of project traffic of at least 1 percent. The proportional share calculations are based on use of the City's proportional share spreadsheet and the project's daily trip assignment, as shown in Appendix F. Table 10 summarizes the intersection proportional share calculations.

Table 10
Intersection Proportional Shares

Intersection #	Intersection	Proportional Share (%)	Detailed Analysis Required?
403	**NE 85th St / 120th Ave NE**	**1.40%**	**YES**
405	**120th Ave NE / NE 80th St**	**4.32%**	**YES**
407	NE 70th St / 116th Ave NE	0.64%	No
409	NE 85th St / 122nd Ave NE	0.53%	No
--	122nd Ave NE (north) / NE 80th Street	0.80%	No
--	122nd Ave NE (south) / NE 80th Street	0.48%	No
--	116th Ave NE / NE 75th Street	0.88%	No
--	122nd Ave NE / NE 75th Street	0.72%	No
--	122nd Ave NE / NE 70th Street	0.72%	No

As shown in Table 10, two intersections have a project proportional share of at least one percent with the proposed LWHS Addition project. Detailed traffic analysis was conducted at these two study intersections and also at existing LWHS driveways on NE 75th Street. Additionally, per the request of the City, detailed traffic analysis was conducted at the intersection of 116th Ave NE / NE 75th Street and 122nd Ave NE (north) / NE 80th Street during the AM and afternoon peak hours. Appendix G contains the proportional share evaluation worksheets for each intersection.

Future Traffic Volumes

Future year 2020 No Action (without project) AM and afternoon peak hour traffic volumes at the study intersections and site driveways were estimated by applying a 2.5 percent annual growth rate to the existing (2018) volumes (see Figure 3 and Figure 4). Future year 2023 No Action (without project) PM peak hour traffic volumes at the study intersections without the project were estimated by applying a 2.0 percent annual growth rate to the 2018 existing volumes (see Figure 5) and also including pipeline project volumes as provided by the City. *It should be noted that the annual growth rate was not applied to turning movements at the 3 LWHS site access driveways.*

In addition to the annual growth rate and pipeline volumes provided by the City, the future year 2020 No Action traffic volumes include trips associated with an additional 186 students that represent the current entitled LWHS student capacity of 1,727 students (1,727 entitled students less 1,541 existing enrollment = 186 additional students). The trips associated with the additional 186 students were distributed to the site access driveways consistent with the trip distribution illustrated in Figure 6.

The resulting 2020 No Action AM and afternoon peak hour traffic volumes at the study intersections are illustrated in Figure 10 and Figure 11 and the 2020 No Action PM peak hour traffic volumes at the study intersections are illustrated in Figure 12.

Future year 2020 With Project peak hour traffic volumes were estimated by adding the new project trips associated with the LWHS Addition (Figures 7 to 9) to the 2020 No Action traffic volumes (Figures 10 to 12). The resulting future year 2020 With Project peak hour traffic volumes at the study intersections are shown in Figures 13 to 15 for the weekday AM, afternoon, and PM peak hours.

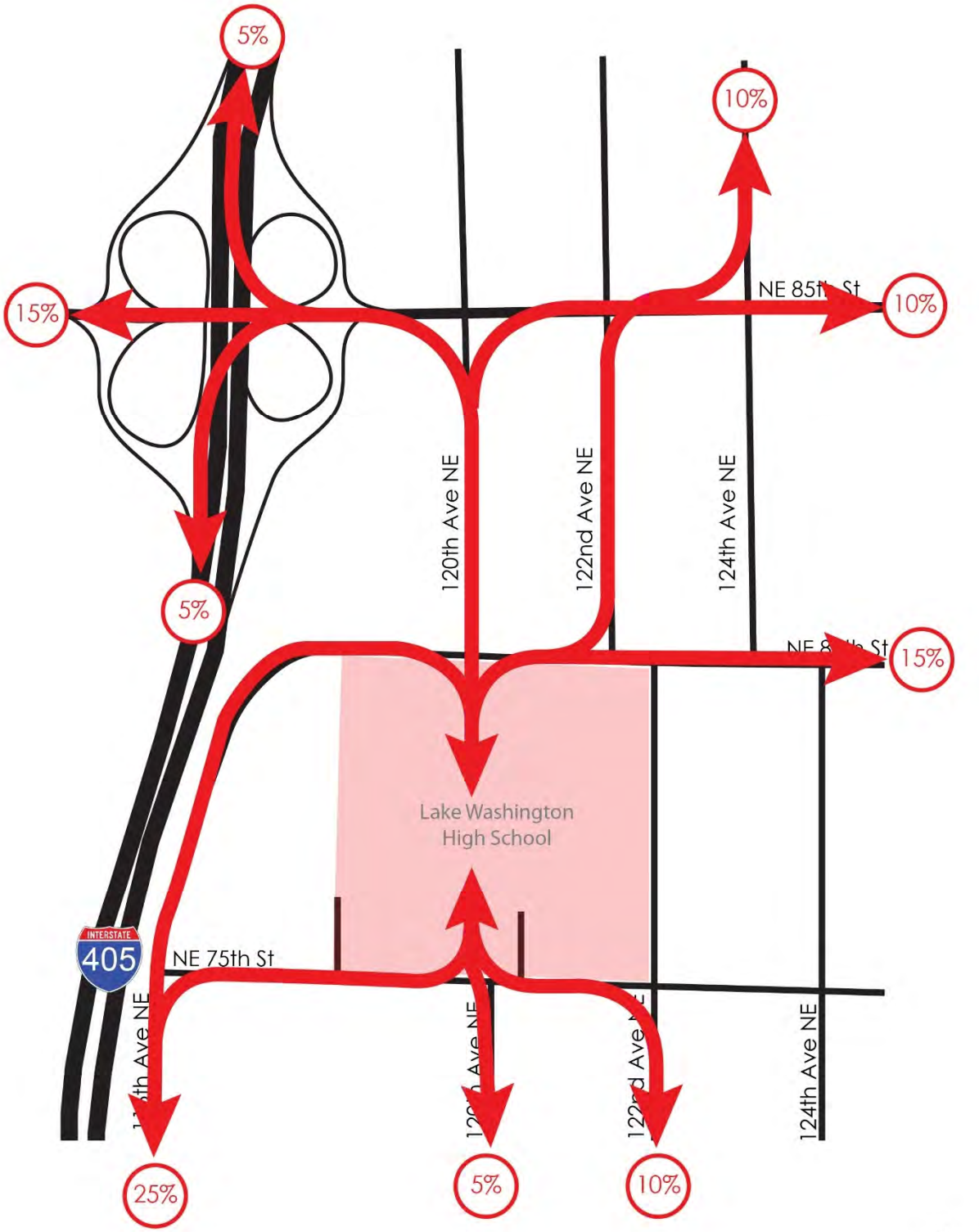


Figure 6: Project Trip Distribution

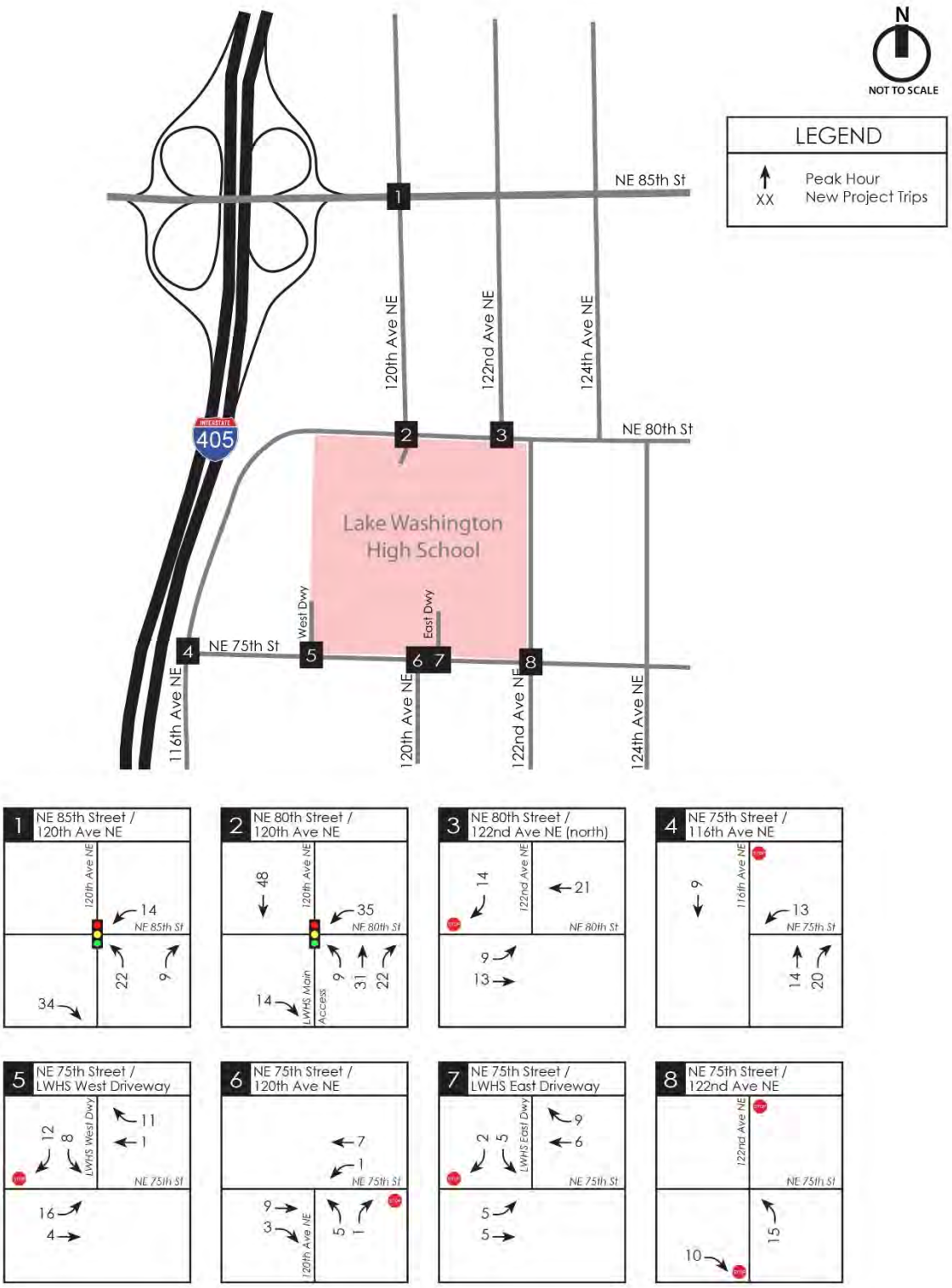


Figure 7: AM Peak Hour Project Trip Assignment

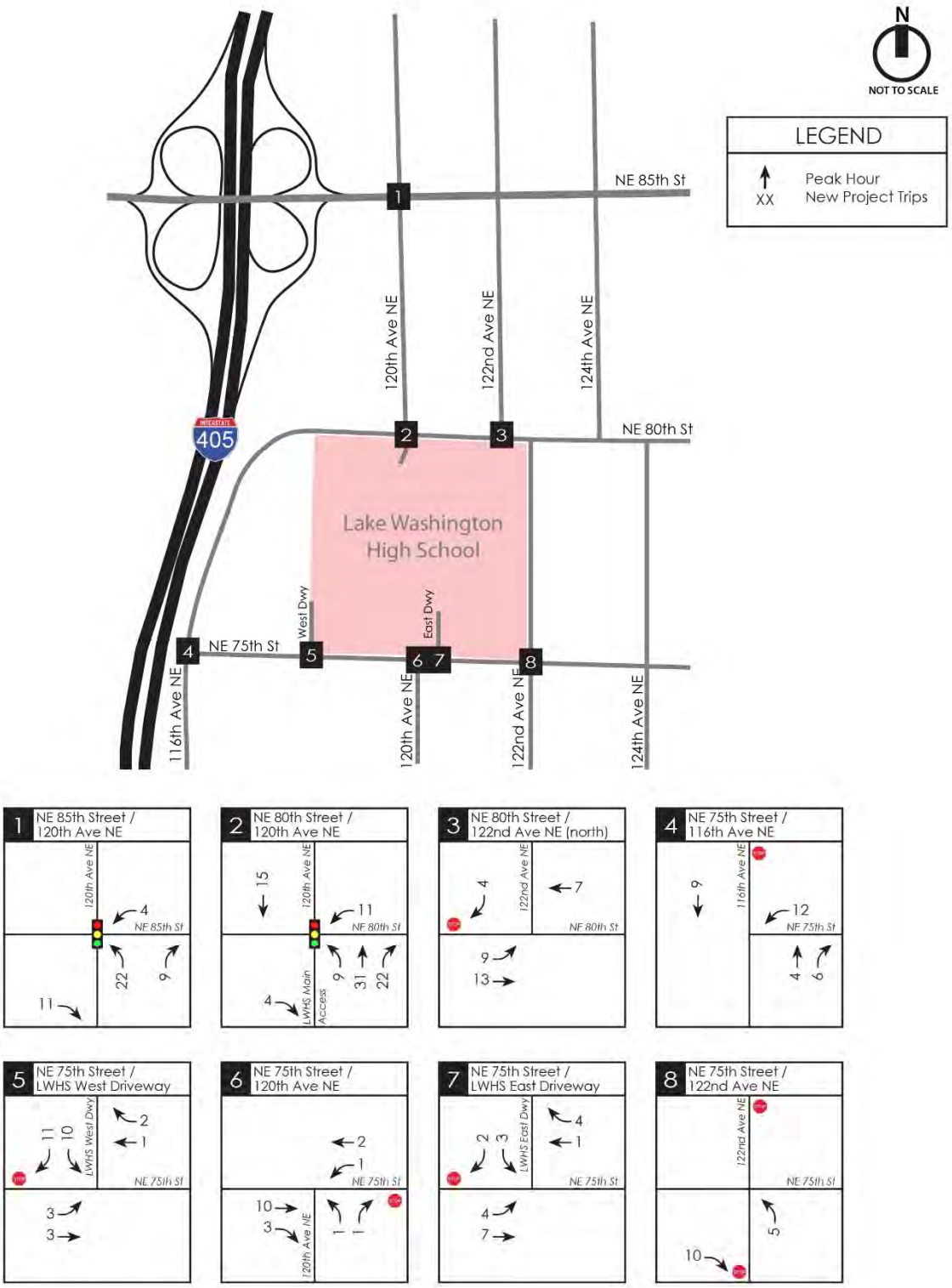


Figure 8: Afternoon Peak Hour Project Trip Assignment

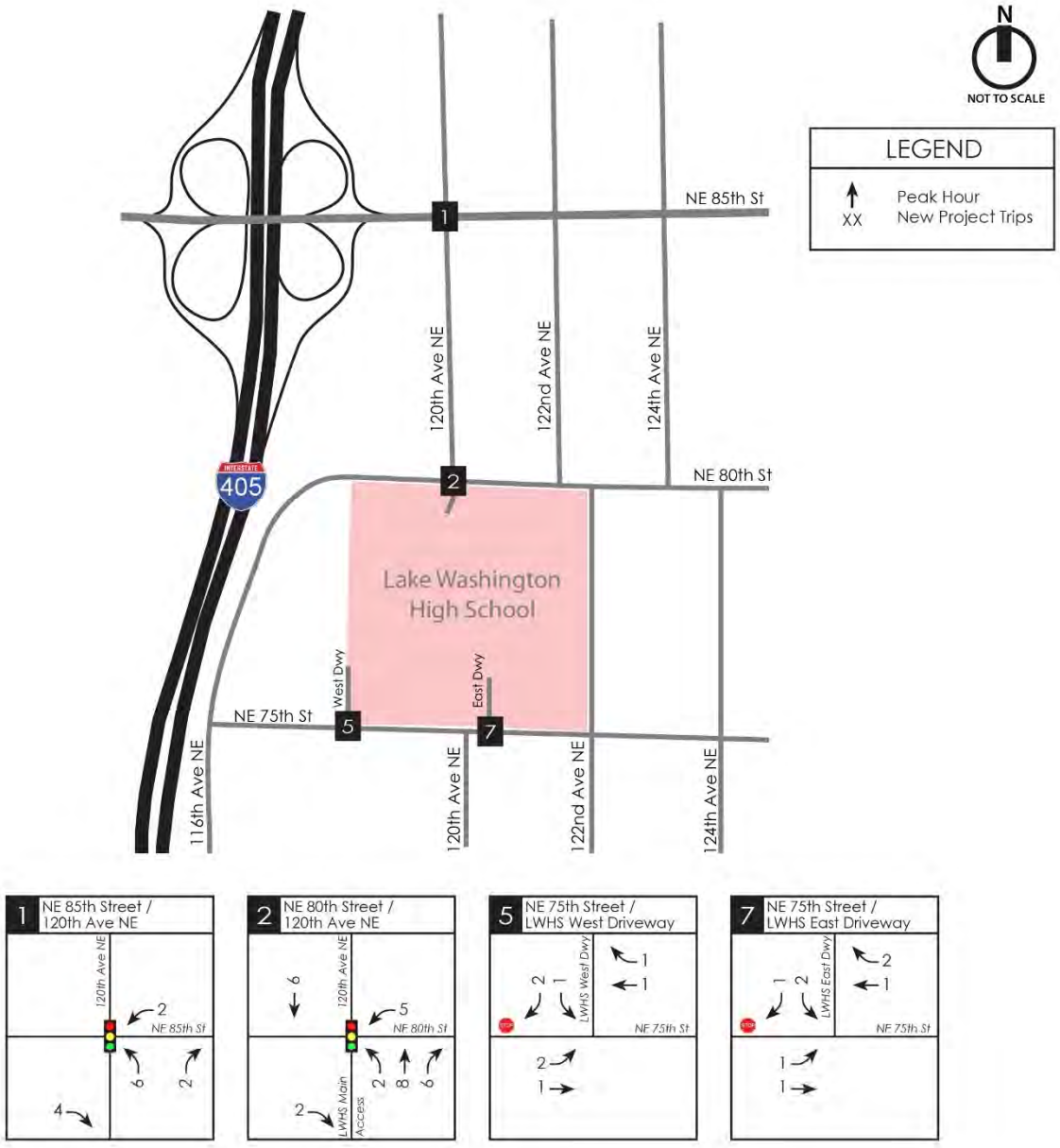


Figure 9: PM Peak Hour Project Trip Assignment

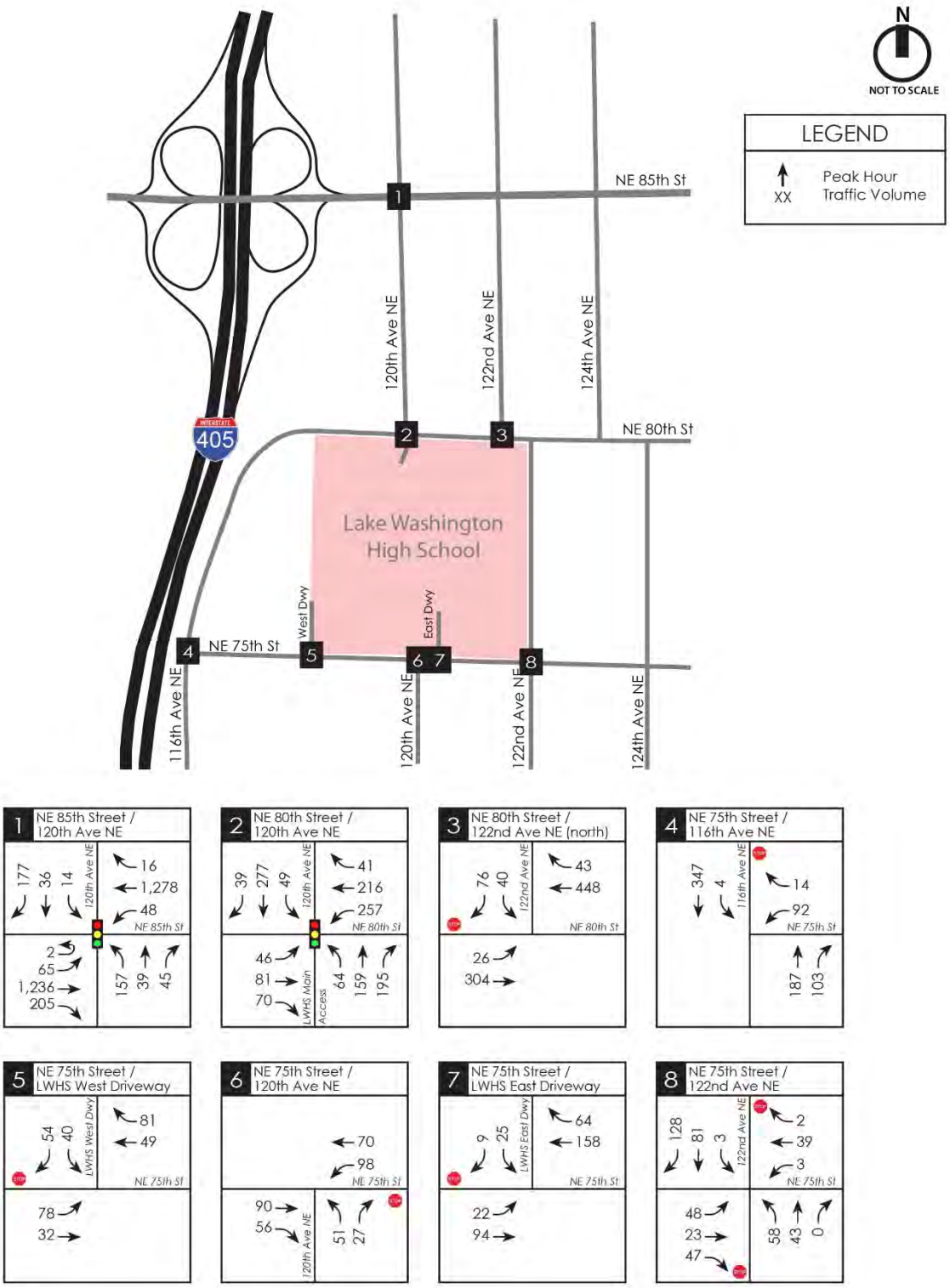


Figure 10: 2020 No Action AM Peak Hour Traffic Volumes

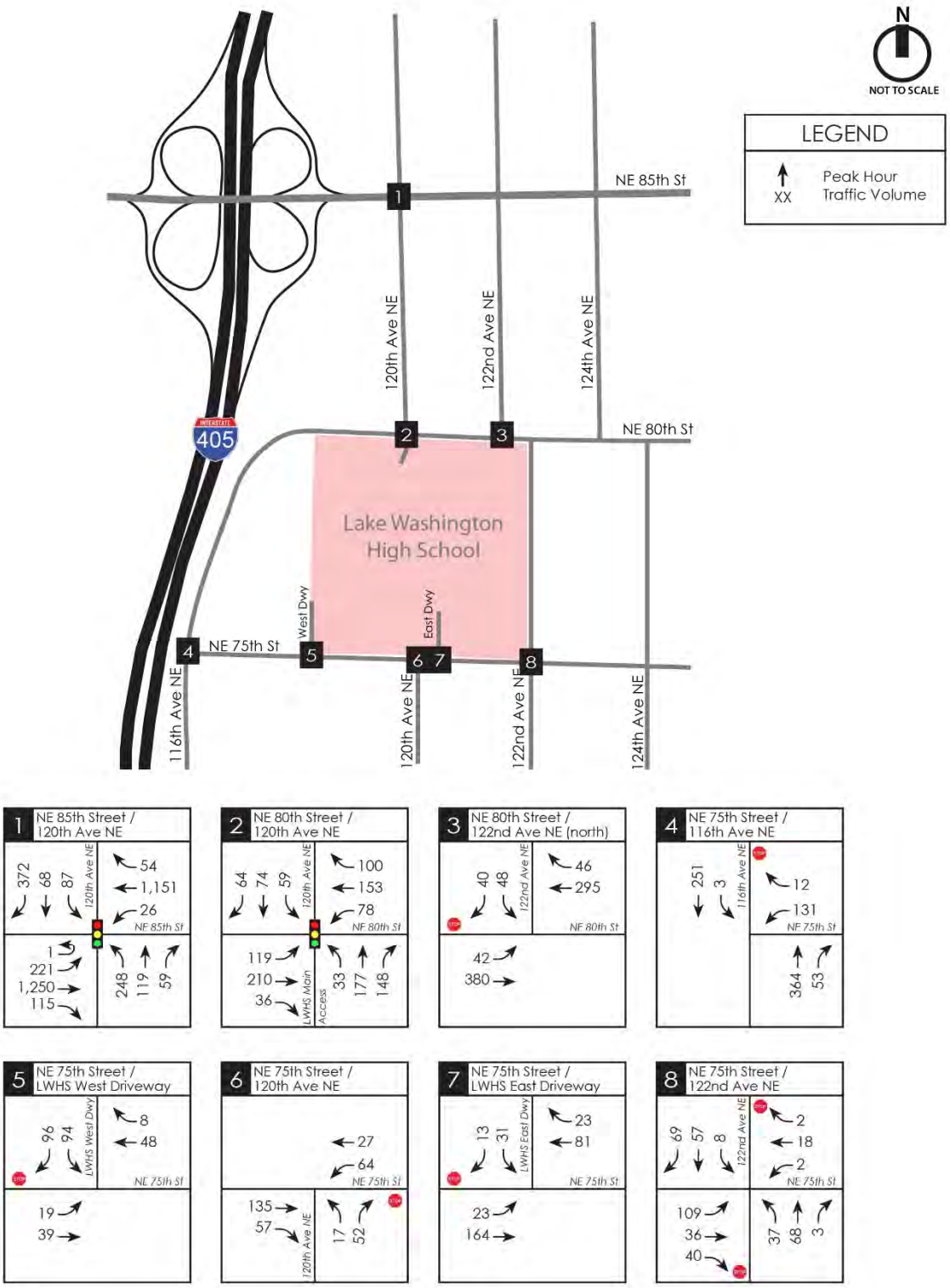


Figure 11: 2020 No Action Afternoon Peak Hour Traffic Volumes

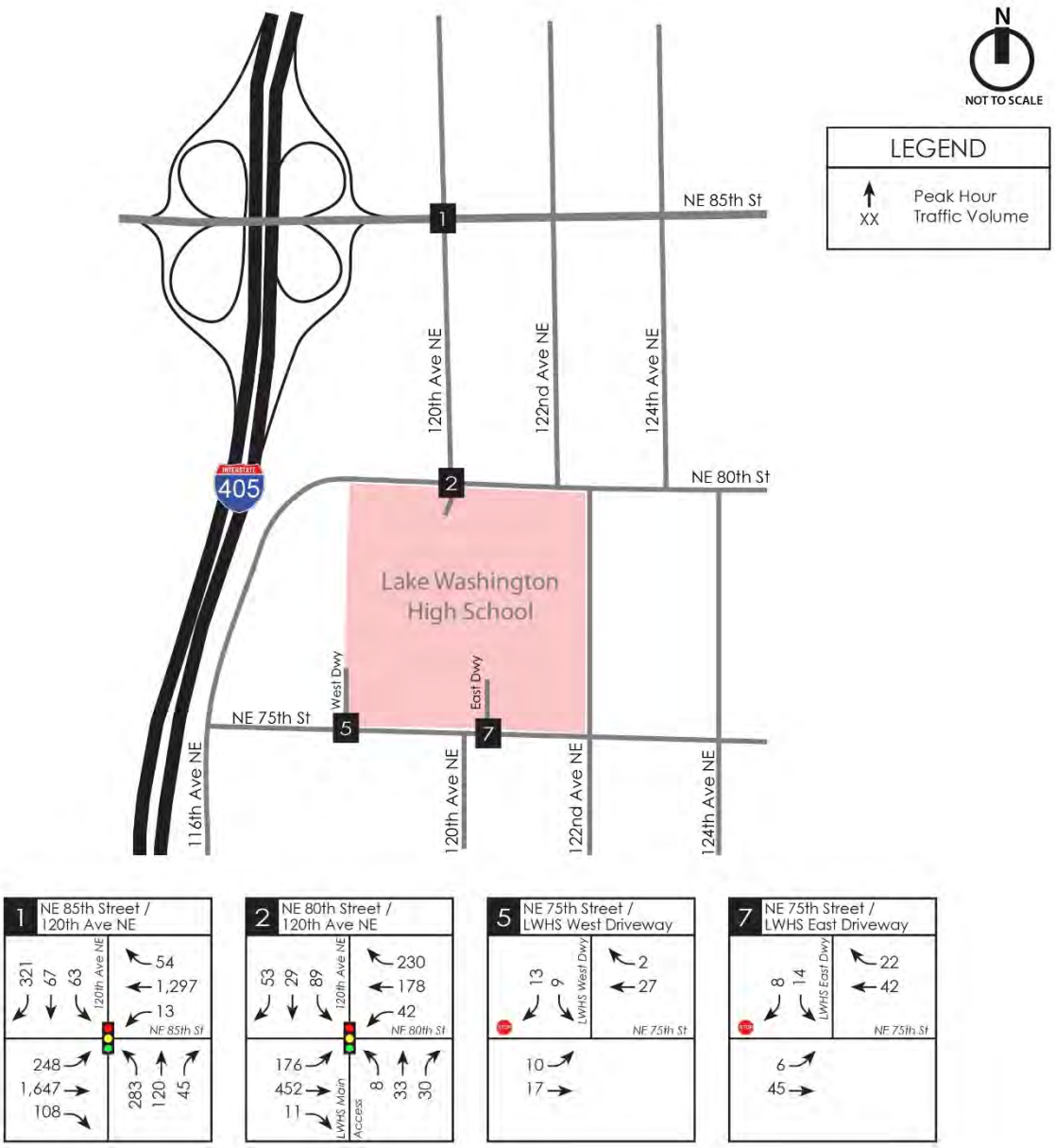


Figure 12: 2020 No Action PM Peak Hour Traffic Volumes

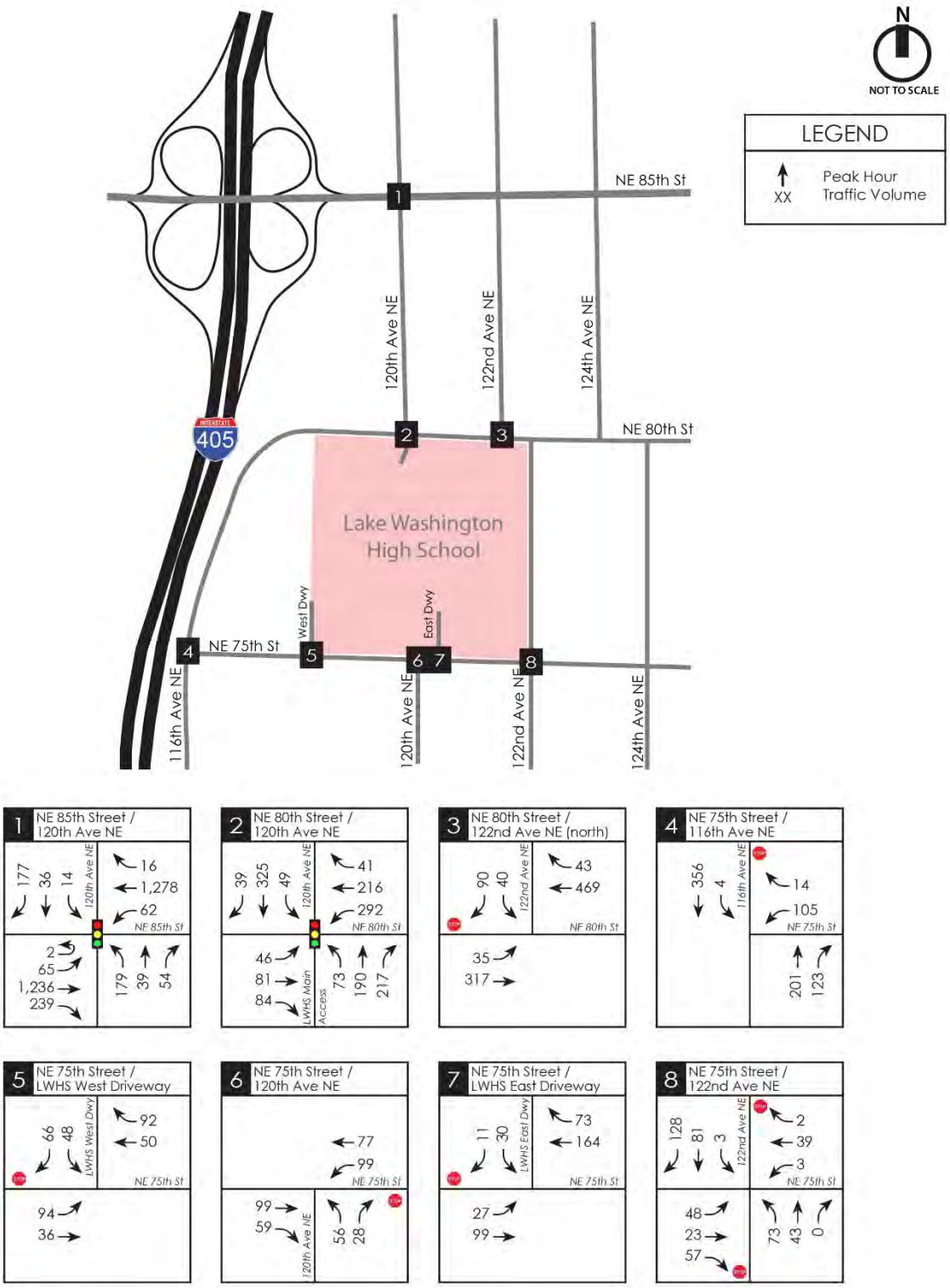


Figure 13: 2020 With Project AM Peak Hour Traffic Volumes

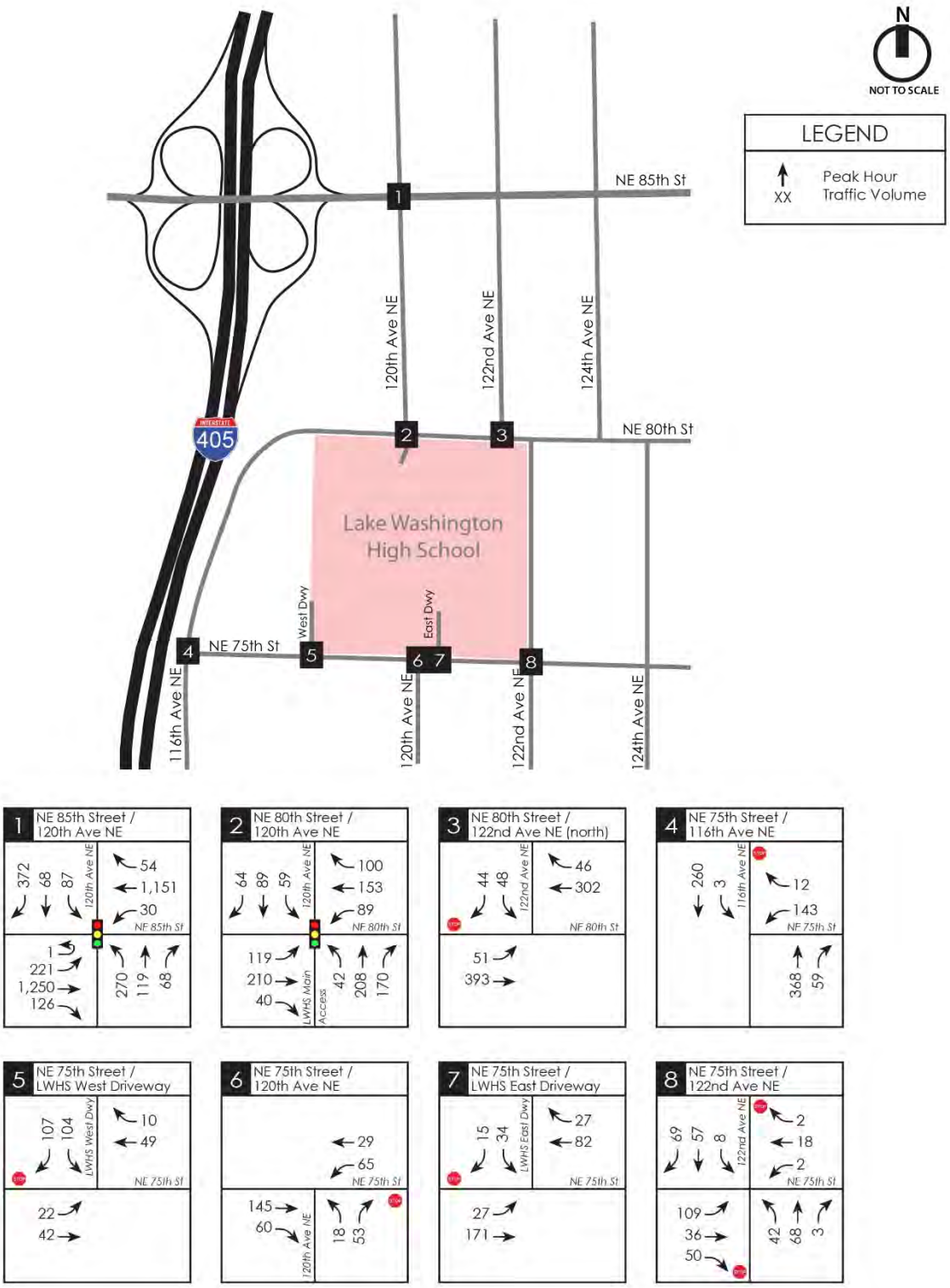


Figure 14: 2020 With Project Afternoon Peak Hour Traffic Volumes

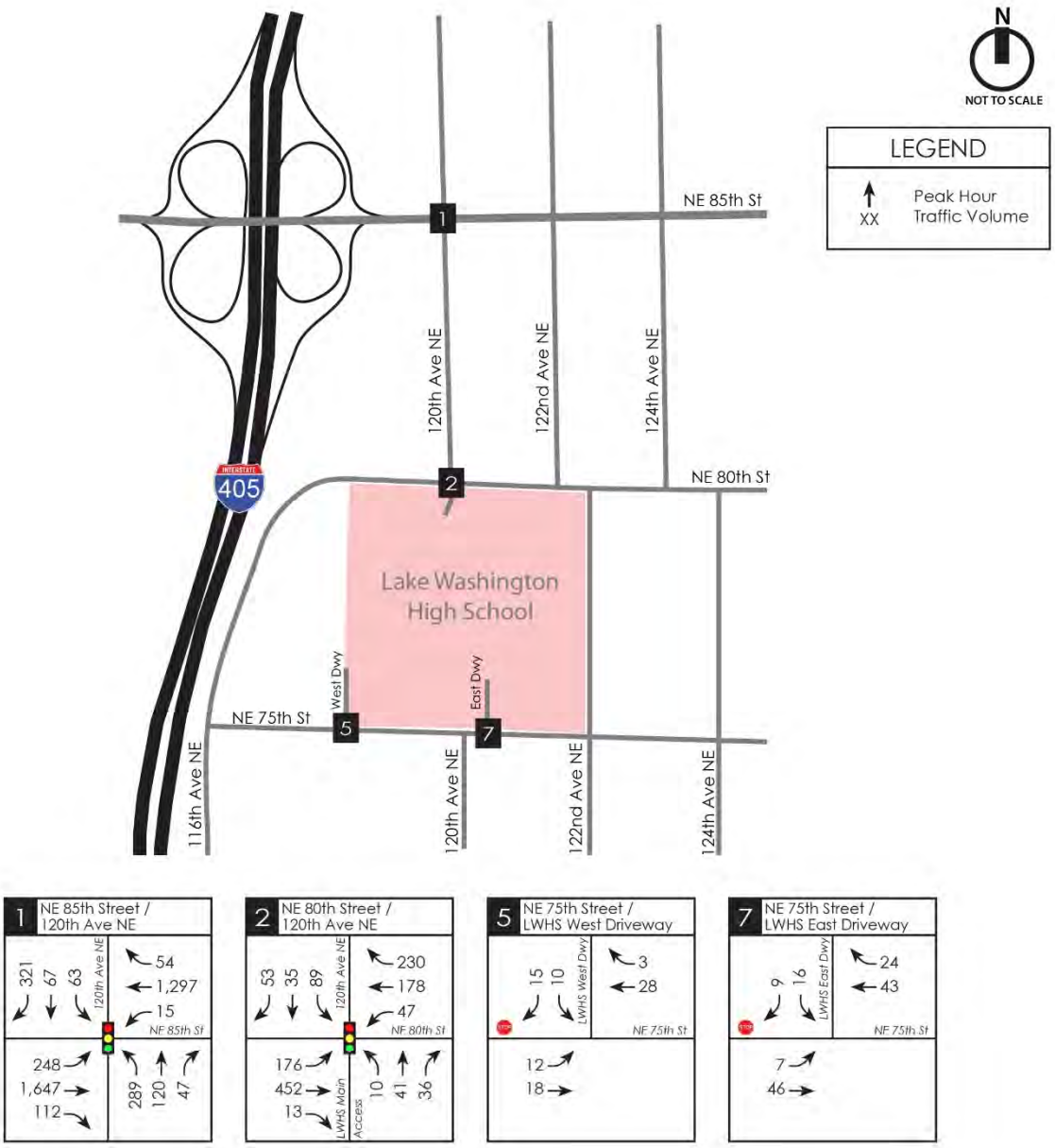


Figure 15: 2020 With Project PM Peak Hour Traffic Volumes

Intersection Operations

A future year weekday peak hour Level of Service (LOS) analysis was conducted at the study intersections for future year 2020 No Action (without project) conditions and future year 2020 conditions with the proposed LWHS addition project.

The roadway network and signal timing assumed in the future year 2020 LOS analysis was based on existing conditions as no planned improvements at the study intersections have been identified for construction by 2020.

The weekday AM peak hour, afternoon peak hour, and PM peak hour LOS results at the study intersections for 2020 No Action and 2020 With Project conditions are summarized in Table 11, Table 12, and Table 13. The LOS worksheets are included in Appendix B.

Table 11
2020 AM Peak Hour Level of Service Summary

	2020 No Action		2020 With Project	
Study Intersection	LOS	Delay (sec)	LOS	Delay (sec)
Signalized Intersections				
1. NE 85th Street / 120th Ave NE	C	20.1	C	22.2
2. NE 80th Street / 120th Ave NE	D	41.1	F	98.5
Stop-Controlled Intersections				
3. NE 80th Street / 122nd Ave NE				
Eastbound Left-Turn	A	9.0	A	9.2
Southbound Shared Left-Right	C	24.0	D	27.6
4. NE 75th Street / 116th Ave NE				
Westbound shared Left-Right	C	20.9	C	24.4
Southbound Left-Turn	A	8.1	A	8.2
5. NE 75th Street / LWHS West Driveway				
Eastbound Left-Turn	A	8.4	A	8.6
Southbound shared Left-Right	C	16.9	C	23.1
6. NE 75th Street / 120th Ave NE				
Northbound Shared Left-Right	C	17.1	C	18.2
Westbound Left-Turn	A	8.3	A	8.3
7. NE 75th Street / LWHS East Driveway				
Eastbound Left-Turn	A	8.4	A	8.5
Southbound shared Left-Right	B	14.3	C	15.3
8. NE 75th Street / 122nd Ave NE				
Northbound Left-Turn	A	8.3	A	8.4
Eastbound Shared Left-Thru-Right	C	18.6	C	20.3
Westbound Shared Left-Thru-Right	C	17.3	C	18.5
Southbound Left-Turn	A	7.8	A	7.8

Table 12
2020 Afternoon Peak Hour Level of Service Summary

Study Intersection	2020 No Action LOS	2020 No Action Delay (sec)	2020 With Project LOS	2020 With Project Delay (sec)
Signalized Intersections				
1. NE 85th Street / 120th Ave NE	D	41.6	D	42.3
2. NE 80th Street / 120th Ave NE	B	17.3	B	18.1
Stop-Controlled Intersections				
3. NE 80th Street / 122nd Ave NE				
Eastbound Left-Turn	A	8.4	A	8.5
Southbound Shared Left-Right	C	20.3	C	21.4
4. NE 75th Street / 116th Ave NE				
Westbound shared Left-Right	C	21.3	C	23.2
Southbound Left-Turn	A	8.4	A	8.4
5. NE 75th Street / LWHS West Driveway				
Eastbound Left-Turn	A	7.5	A	7.5
Southbound shared Left-Right	B	12.5	B	13.3
6. NE 75th Street / 120th Ave NE				
Northbound Shared Left-Right	C	16.9	C	17.4
Westbound Left-Turn	A	8.8	A	8.9
7. NE 75th Street / LWHS East Driveway				
Eastbound Left-Turn	A	8.1	A	8.2
Southbound shared Left-Right	C	15.0	C	15.6
8. NE 75th Street / 122nd Ave NE				
Northbound Left-Turn	A	7.9	A	7.9
Eastbound Shared Left-Thru-Right	C	18.1	C	18.7
Westbound Shared Left-Thru-Right	B	13.5	B	13.7
Southbound Left-Turn	A	7.6	A	7.6

Table 13
2020 PM Peak Hour Level of Service Summary

Study Intersection	2020 No Action LOS	2020 No Action Delay (sec)	2020 With Project LOS	2020 With Project Delay (sec)
Signalized Intersections				
1. NE 85th Street / 120th Ave NE	D	49.8	D	50.5
2. NE 80th Street / 120th Ave NE	B	11.3	B	11.6
Stop-Controlled Intersections				
5. NE 75th Street / LWHS West Driveway				
Eastbound Left-Turn	A	7.3	A	7.3
Southbound shared Left-Right	A	8.8	A	8.8
7. NE 75th Street / LWHS East Driveway				
Eastbound Left-Turn	A	7.5	A	7.5
Southbound shared Left-Right	A	9.7	A	9.8

As shown in Tables 11-13, the signalized study intersections and individual movements at the stop-controlled intersections are all anticipated to operate at LOS D or better in 2020 during the weekday AM, afternoon, and PM peak hours without or with the proposed Lake Washington High School Addition with one exception; the NE 80th Street / 120th Avenue NE signalized intersection is anticipated to operate at LOS F with the proposed project during the weekday AM peak hour. It should be noted that operations at the NE 80th Street / 120th Avenue NE signalized intersection could be improved to LOS E with signal timing optimization.

The installation of site-specific improvements under SEPA is primarily determined by the results of both the proportional share analysis (shown in Table 10), and the LOS analysis at the study intersections (shown in Table 11-13). Table 14 is used as a guide by the City of Kirkland in determining when mitigation under SEPA is required.

Table 14
Guidelines for Installation of Improvements under SEPA

Peak Hour Intersection LOS with Project Traffic	Install Improvements?
A thru D	No
E	If intersection proportional share > 15%
F	If intersection proportional share > 5%

As shown in Tables 11-13, all study intersections are anticipated to operate at LOS D or better in the 2020 with the proposed LWHS Addition with one exception; the NE 80th Street / 120th Avenue NE signalized intersection is anticipated to operate at LOS F during the weekday AM peak hour. The LWHS Addition project proportional share at this intersection is 4.32% (as shown in Table 10). Therefore, the installation of improvements under SEPA is not required at any of the study intersections.

Vehicular Access and Circulation

With the proposed LWHS Addition, vehicular access to LWHS would continue to be provided via the signalized intersection of NE 80th Street/120th Ave NE and via the two stop-controlled driveways on NE 75th Street. Vehicular circulation, drop-off/pick-up location and circulation, pedestrian/bike circulation, and service vehicle circulation on the LWHS campus are expected to be maintained with the proposed project.

Parking Analysis

Parking Code

The Kirkland Zoning Code does not establish a required parking ratio for school uses. Instead, it defers to KZC Section 105.25, which authorizes the Planning Official to establish required parking on a case-by-case basis.

Parking Supply

Based on the current site plan, the proposed Lake Washington High School Addition project would result in a net increase of 20 parking stalls for a total on-site parking supply of 530 stalls. The total future parking supply includes the removal of existing stalls for the proposed addition (-100 stalls), restoring the parking stalls currently occupied by portables (+72 stalls) and the expansion of the existing surface parking on the northwest corner of the LWHS site (+48 net stalls).

Existing Weekday Peak Parking Demand

The future weekday peak parking demand estimates for the proposed Lake Washington High School Addition project were estimated based on a parking demand study conducted at the existing school on two weekdays (Tuesday, September 18, 2018 and Thursday, September 20, 2018). The existing school parking supply was field-verified by TENW in September 2018 and includes a total of 510 on-site parking stalls.

To assess current weekday parking demand during school hours, the number of parked vehicles on-site were recorded at 8:45 a.m. on the two weekdays. Based on the results of the study, the two-day average weekday parking demand observed at LWHS was 407 vehicles. At the time of the parking demand counts, LWHS had 1,541 students enrolled. The two-day average peak weekday demand of 407 vehicles corresponds to a peak parking demand rate of 0.26 vehicles per student. Appendix H includes the existing weekday parking demand study data.

Future Weekday Parking Demand and Proposed Supply

Based on the results of our parking demand study, the existing weekday peak parking demand at LWHS is 0.26 vehicles per student.

With the proposed Addition project, up to 2,000 total students are expected at the school. Using the existing peak demand ratio per student, the future weekday peak parking demand with the addition project is estimated to be 520 vehicles (0.26 vehicles per student X 2,000 future students). Therefore, the proposed supply of 530 stalls would be expected to accommodate the typical weekday peak demand at the school. The future weekday parking demand calculations are included in Appendix H.

Neighborhood Parking Impacts

LWHS makes every effort to reduce parking impacts to neighborhoods within the immediate vicinity of the site. Most of the neighborhood streets and cul-de-sacs in the immediate vicinity of Lake Washington High School have signs that say "No Parking 8 AM to 2 PM School Days" so there is minimal legal on-street parking available for LWHS students/staff/visitors in the adjacent neighborhoods. At the time of the weekday parking demand study at LWHS in September 2018, there were no vehicles observed to be parked off-site or in adjacent neighborhoods that were clearly associated with LWHS.

Event Parking

With regard to events, high school sites are typically sized to accommodate event-related parking on-site. Large events that may generate parking demand that would exceed the on-site parking supply at usually only occur a few times per year. During events at Lake Washington High School, additional parking can be accommodated through the use of on-site drop-off/pick-up lane for parking (storage for approximately 31 additional vehicles), and off-site parking is available via legal on-street parking on both sides of 120th Ave NE (north of NE 80th Street) and on the east side of 122nd Ave NE (north of NE 80th Street).

MITIGATION SUMMARY

Concurrency

The project was evaluated for transportation concurrency by the City of Kirkland in October 2018. Based on the results, the City has determined the projects meets the City's transportation concurrency requirements. Therefore, no short-term transportation mitigation was required to obtain concurrency in the City of Kirkland.

SEPA Improvements

The installation of site-specific improvements under SEPA is determined based on the guidelines shown in Table 14. Based on the results of the LOS analysis and the proportional share calculations at the study intersections, the installation of improvements under SEPA is not required.

Transportation Impact Fees

Transportation mitigation required by the City of Kirkland is payment of an impact fee based on the project's proposed land use. The proposed LWHS Addition would result in an enrollment of up to 273 additional students.

Based on the currently adopted cost per trip ($311.25 per high school student as of January 1, 2018), the proposed LWHS Addition project results in a preliminary net transportation impact fee of $84,971. The cost per trip is subject to change and final impact fee calculations will be conducted at the time of building permit issuance.

Appendix A

Collision History

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* THE FOLLOWING INTERSECTIONS & ROAD SEGMENTS IN THE CITY OF KIRKLAND

120th AVE @ 85th ST
120th AVE @ 80th ST
SR 405LX01744 (aka 116th AVE, MP 0.17 - 0.22) @ 72nd PL / 70th PL
75th ST FROM 116th AVE TO 122nd AVE
80th ST FROM 116th AVE TO 122nd AVE

01/01/2013 - 12/31/2017

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	MILEPOST	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	King	Kirkland	116TH AVE NE	7000	NE 70TH PL						E249412	#########	18:15	No Apparent Injury	0	0	2	0	0	At Driveway within Major Intersection	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	7000	NE 70TH PL						E267308	#########	18:07	Possible Injury	1	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	116TH AVE NE	7000	NE 70TH PL						E271138	#########	19:04	Possible Injury	1	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Dusk	Same direction -- both turning right -- one stopped -- rear end
City Street	King	Kirkland	116TH AVE NE	7000	NE 70TH PL						E285047	#########	12:24	Possible Injury	1	0	2	0	0	At Intersection and Not Related	Overcast	Wet	Daylight	From opposite direction - all others
City Street	King	Kirkland	116TH AVE NE		NE 70TH PL						E335547	#########	12:35	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	116TH AVE NE	7000	NE 70TH PL						E365700	#########	12:24	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Raining	Wet	Daylight	Same direction -- both turning right -- one stopped -- rear end
City Street	King	Kirkland	116TH AVE NE	7000	NE 70TH PL						E380267	#########	14:54	No Apparent Injury	0	0	2	0	0	At Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	116TH AVE NE	7000	NE 70TH PL						E381070	#########	22:56	Possible Injury	1	0	2	0	0	At Intersection and Related	Raining	Wet	Dark-Street Lights On	From opposite direction - one left turn - one straight
City Street	King	Kirkland	116TH AVE NE	7000	NE 70TH PL						E382486	#########	18:35	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Raining	Wet	Dark-No Street Lights	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	116TH AVE NE	7000	NE 70TH PL						E471434	#########	15:10	Suspected Minor Injury	1	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	116TH AVE NE	7000	NE 70TH PL						E555057	#########	08:30	Possible Injury	1	0	2	0	0	At Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - all others
City Street	King	Kirkland	116TH AVE NE	7000	NE 70TH PL						E572823	#########	16:56	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	116TH AVE NE	12200		210	F	N	120TH AVE NE		E218609	#########	15:00	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	From same direction - one left turn - one straight
City Street	King	Kirkland	116TH AVE NE	12300		300	F	N	120TH AVE NE		E219921	#########	22:05	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Raining	Wet	Dark-Street Lights On	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	116TH AVE NE	12300		386	F	N	120TH AVE NE		E223494	#########	13:26	No Apparent Injury	0	0	2	0	0	At Driveway	Raining	Wet	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12400		449	F	N	120TH AVE NE		E251388	#########	12:41	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE			125	F	N	120TH AVE NE		E253720	#########	12:47	Possible Injury	1	0	2	0	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	116TH AVE NE	12400		0.1	M	N	120TH AVE NE		E264960	#########	15:15	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12300		398	F	N	120TH AVE NE		E267908	#########	07:36	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12300		410	F	N	120TH AVE NE		E268923	#########	16:28	Possible Injury	1	0	2	0	0	Driveway Related but Not at Driveway	Overcast	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	116TH AVE NE	12300				N	120TH AVE NE		E303074	#########	12:27	No Apparent Injury	0	0	2	0	0	At Driveway	Overcast	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12200		200	F	N	120TH AVE NE		E305949	#########	23:00	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Wet	Dark-Street Lights On	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12300		396	F	N	120TH AVE NE		E306096	#########	17:34	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Dark-Street Lights On	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12400		0.1	M	N	120TH AVE NE		E307017	#########	12:14	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	116TH AVE NE			120	F	N	120TH AVE NE		E330743	#########	17:28	Possible Injury	1	0	2	0	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	116TH AVE NE	12200		90	F	N	120TH AVE NE		E332811	#########	10:39	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12400		0.11	M	N	120TH AVE NE		E333803	#########	20:58	No Apparent Injury	0	0	1	0	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	Signal Pole
City Street	King	Kirkland	116TH AVE NE	12400		479	F	N	120TH AVE NE		E335514	#########	12:09	No Apparent Injury	0	0	2	0	0	At Driveway	Overcast	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12300		300	F	N	120TH AVE NE		E349399	#########	15:49	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12400		497	F	N	120TH AVE NE		E355209	#########	16:09	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12400		0.11	M	N	120TH AVE NE		E357684	#########	18:47	Suspected Minor Injury	1	0	1	1	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Dusk	Vehicle going straight hits pedestrian
City Street	King	Kirkland	116TH AVE NE	12400		0.11	M	N	120TH AVE NE		E360245	#########	13:59	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	From same direction - one right turn - one straight
City Street	King	Kirkland	116TH AVE NE	12400		0.11	M	N	120TH AVE NE		E369252	#########	16:45	Suspected Minor Injury	2	0	2	0	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	116TH AVE NE	12300		317	F	N	120TH AVE NE		E387004	#########	15:45	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12400		490	F	N	120TH AVE NE		E408759	#########	13:25	Possible Injury	2	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12400		489	F	N	120TH AVE NE		E436659	#########	14:55	Possible Injury	1	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12500		0.12	M	N	120TH AVE NE		E445292	#########	15:40	Suspected Serious Injury	1	0	1	1	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	Vehicle going straight hits pedestrian
City Street	King	Kirkland	116TH AVE NE	12400		0.11	M	N	120TH AVE NE		E490998	#########	15:12	No Apparent Injury	0	0	2	0	0	Driveway Related but Not at Driveway	Raining	Wet	Daylight	From same direction - both going straight - both moving - rear-end
City Street	King	Kirkland	116TH AVE NE	12400		493	F	N	120TH AVE NE		E490999	#########	12:29	Possible Injury	1	0	2	0	0	At Driveway	Overcast	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12300		321	F	N	120TH AVE NE		E497197	#########	16:02	No Apparent Injury	0	0	2	0	0	At Driveway	Raining	Wet	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12500		0.11	M	N	120TH AVE NE		E509335	#########	13:45	Possible Injury	1	0	2	0	0	At Driveway	Raining	Wet	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12400		402	F	N	120TH AVE NE		E511071	#########	13:05	No Apparent Injury	0	0	2	0	0	At Driveway	Raining	Wet	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12400		484	F	N	120TH AVE NE		E536003	#########	16:55	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12400		500	F	N	120TH AVE NE		E545927	#########	15:20	No Apparent Injury	0	0	2	0	0	At Driveway	Raining	Wet	Daylight	From same direction - all others
City Street	King	Kirkland	116TH AVE NE	12400		500	F	N	120TH AVE NE		E570212	#########	18:04	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12300		317	F	N	120TH AVE NE		E634542	#########	17:22	No Apparent Injury	0	0	2	0	0	At Driveway	Raining	Wet	Dark-Street Lights On	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12200		200	F	N	120TH AVE NE		E642227	#########	10:39	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	116TH AVE NE	12400		497	F	N	120TH AVE NE		E652725	#########	13:16	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Wet	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12400		0.11	M	N	120TH AVE NE		E656117	#########	12:34	No Apparent Injury	0	0	2	0	0	Driveway Related but Not at Driveway	Raining	Wet	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	116TH AVE NE	12500		0.12	M	N	120TH AVE NE		E672332	#########	16:25	Suspected Serious Injury	2	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12200		177	F	N	120TH AVE NE		E695088	#########	09:18	No Apparent Injury	0	0	2	0	0	At Driveway within Major Intersection	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12300		234	F	N	120TH AVE NE		E704491	#########	13:11	Possible Injury	1	0	2	0	0	Driveway Related but Not at Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12500		0.11	M	N	120TH AVE NE		E731138	#########	16:22	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12400		0.11	M	N	120TH AVE NE		E743658	#########	13:41	No Apparent Injury	0	0	4	0	0	At Driveway	Raining	Wet	Daylight	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12400		485	F	N	120TH AVE NE		E751819	#########	16:12	No Apparent Injury	0	0	2	0	0	At Driveway	Raining	Wet	Dark-Street Lights On	Entering at angle
City Street	King	Kirkland	116TH AVE NE	12200		106	F	N	120TH AVE NE		E755077	#########	19:30	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Overcast	Dry	Dark-Street Lights On	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	116TH AVE NE	6900		0.14	M	S	NE 70TH PL		E439209	#########	16:06	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - all others
City Street	King	Kirkland	116TH AVE NE	7400		25	F	S	NE 75TH ST		E432426	#########	12:44	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	120TH AVE NE	8000	NE 80TH ST						E309530	#########	16:05	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Raining	Wet	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	120TH AVE NE	8000	NE 80TH ST						E593689	#########	16:47	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	120TH AVE NE	8500	NE 85TH ST						E237462	#########	08:20	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Raining	Wet	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	120TH AVE NE	0	NE 85TH ST						E321444	#########	19:31	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* THE FOLLOWING INTERSECTIONS & ROAD SEGMENTS IN THE CITY OF KIRKLAND

120th AVE @ 85th ST
120th AVE @ 80th ST
SR 405LX01744 (aka 116th AVE, MP 0.17 - 0.22) @ 72nd PL / 70th PL
75th ST FROM 116th AVE TO 122nd AVE
80th ST FROM 116th AVE TO 122nd AVE

01/01/2013 - 12/31/2017

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	MILEPOST	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	King	Kirkland	120TH AVE NE		NE 85TH ST						E339066	#########	12:58	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	120TH AVE NE	8300	NE 85TH ST						E354414	#########	16:32	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	120TH AVE NE	9900	NE 85TH ST						E357676	#########	18:02	No Apparent Injury	0	0	2	0	0	At Driveway within Major Intersection	Clear or Partly Cloudy	Dry	Daylight	From same direction - one right turn - one straight
City Street	King	Kirkland	120TH AVE NE	8300	NE 85TH ST						E373531	#########	11:30	Possible Injury	1	0	2	0	0	At Driveway within Major Intersection	Raining	Wet	Daylight	From same direction - both going straight - both moving - rear-end
City Street	King	Kirkland	120TH AVE NE	8300	NE 85TH ST						E446497	#########	14:49	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	120TH AVE NE	8300	NE 85TH ST						E458643	#########	16:29	Possible Injury	1	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	120TH AVE NE	8300	NE 85TH ST						E461871	#########	16:59	Possible Injury	2	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	120TH AVE NE	8300	NE 85TH ST						E492318	#########	10:43	No Apparent Injury	0	0	3	0	0	At Intersection and Related	Raining	Wet	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	120TH AVE NE	8300	NE 85TH ST						E498966	#########	16:56	Possible Injury	2	0	2	0	0	At Driveway within Major Intersection	Raining	Wet	Dark-Street Lights On	Entering at angle
City Street	King	Kirkland	120TH AVE NE	8300	NE 85TH ST						E513139	#########	17:21	Possible Injury	2	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Dark-Street Lights On	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	120TH AVE NE	8300	NE 85TH ST						E534783	#########	10:36	Suspected Minor Injury	4	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	120TH AVE NE	8300	NE 85TH ST						E538805	#########	12:23	Possible Injury	1	0	2	0	0	At Driveway within Major Intersection	Raining	Wet	Daylight	Entering at angle
City Street	King	Kirkland	120TH AVE NE	8300	NE 85TH ST						E545925	#########	15:31	No Apparent Injury	0	0	2	0	0	At Driveway within Major Intersection	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	120TH AVE NE	0	NE 85TH ST						E660147	#########	07:56	Possible Injury	1	0	2	0	0	At Intersection and Related	Overcast	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	120TH AVE NE	12200		0.12	M	SE	116TH AVE NE		E377900	#########	11:28	No Apparent Injury	0	0	2	0	0	At Driveway	Raining	Wet	Daylight	Entering at angle
City Street	King	Kirkland	120TH AVE NE	12300		422	F	SE	116TH AVE NE		E388126	#########	07:40	Possible Injury	1	0	2	0	0	At Driveway	Clear or Partly Cloudy	Ice	Dawn	Entering at angle
City Street	King	Kirkland	120TH AVE NE	12300		229	F	S	116TH AVE NE		E461701	#########	20:38	Unknown	0	0	1	0	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Dark-Street Lights On	Metal Sign Post
City Street	King	Kirkland	120TH AVE NE	12300		363	F	S	116TH AVE NE		E477018	#########	17:42	Possible Injury	1	0	2	0	0	At Driveway	Clear or Partly Cloudy	Wet	Dusk	Entering at angle
City Street	King	Kirkland	120TH AVE NE	12200		0.13	M	SE	116TH AVE NE		E519644	#########	18:33	Possible Injury	1	0	2	0	0	At Driveway	Raining	Wet	Dusk	Entering at angle
City Street	King	Kirkland	120TH AVE NE	12300		492	F	SE	116TH AVE NE		E617385	#########	17:36	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Ice	Dark-Street Lights On	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	120TH AVE NE	12200		0.13	M	SE	116TH AVE NE		E647079	#########	12:45	No Apparent Injury	0	0	2	0	0	At Driveway	Raining	Wet	Daylight	Entering at angle
City Street	King	Kirkland	120TH AVE NE	12300		335	F	S	116TH AVE NE		E659127	#########	15:39	No Apparent Injury	0	0	2	0	0	At Driveway	Raining	Wet	Dusk	Entering at angle
City Street	King	Kirkland	120TH AVE NE	8000		350	F	N	NE 80TH ST		E221510	#########	07:59	No Apparent Injury	0	0	2	0	0	Intersection Related but Not at Intersection	Fog or Smog or Smoke	Wet	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	120TH AVE NE	8000		150	F	N	NE 80TH ST		E488064	#########	14:55	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	120TH AVE NE	8400		50	F	S	NE 85TH ST		E233458	#########	15:59	No Apparent Injury	0	0	2	0	0	Intersection Related but Not at Intersection	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - sideswipe
City Street	King	Kirkland	120TH AVE NE	8600		384	F	N	NE 85TH ST		E335085	#########	10:35	No Apparent Injury	0	0	2	0	0	At Driveway	Raining	Wet	Daylight	Entering at angle
City Street	King	Kirkland	120TH AVE NE	8500		247	F	N	NE 85TH ST		E382489	#########	13:36	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	120TH AVE NE	8500				N	NE 85TH ST		E489670	#########	11:55	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	120TH AVE NE	8400		97	F	S	NE 85TH ST		E509091	#########	10:19	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Raining	Wet	Daylight	From same direction - all others
City Street	King	Kirkland	120TH AVE NE	8400		75	F	S	NE 85TH ST		E655024	#########	09:40	No Apparent Injury	0	0	2	0	0	At Driveway	Overcast	Dry	Daylight	From same direction - one left turn - one straight
City Street	King	Kirkland	120TH AVE NE	8500		66	F	N	NE 85TH ST		E725332	#########	20:10	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Dark-Street Lights On	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	120TH AVE NE	8500		90	F	N	NE 85TH ST		E738330	#########	06:32	No Apparent Injury	0	0	1	0	0	At Driveway	Raining	Wet	Dark-Street Lights On	Utility Pole
City Street	King	Kirkland	122ND AVE NE	12100	NE 80TH ST						E245135	#########	17:43	No Apparent Injury	0	0	1	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	Fence
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E223985	#########	18:06	Possible Injury	1	0	2	0	0	At Intersection and Related	Raining	Wet	Dark-Street Lights On	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E229213	#########	19:55	Possible Injury	1	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Dark-Street Lights On	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E243394	#########	18:58	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E244356	#########	11:17	Suspected Minor Injury	1	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 70TH PL		116TH AVE NE						E247507	#########	08:10	Suspected Minor Injury	1	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E250374	#########	18:58	Possible Injury	1	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E308437	#########	21:32	No Apparent Injury	0	0	1	0	0	At Intersection and Not Related	Clear or Partly Cloudy	Dry	Dark-Street Lights On	Signal Pole
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E325117	#########	11:10	No Apparent Injury	0	0	3	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E342367	#########	08:04	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E373532	#########	20:54	Possible Injury	1	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Dark-No Street Lights	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E380269	#########	17:45	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Dark-No Street Lights	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E385687	#########	21:01	Possible Injury	3	0	2	0	0	At Intersection and Related	Raining	Wet	Dark-Street Lights On	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E413255	#########	12:57	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E447200	#########	17:24	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Fog or Smog or Smoke	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E491646	#########	12:00	No Apparent Injury	0	0	3	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - both moving - rear-end
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E512573	#########	18:10	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Raining	Wet	Dark-Street Lights On	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E517940	#########	07:12	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E564721	#########	16:20	No Apparent Injury	0	0	3	0	0	At Intersection and Related	Overcast	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 70TH PL	11600	116TH AVE NE						E568580	#########	07:23	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - all others
City Street	King	Kirkland	NE 70TH PL	11600		177	F	SE	116TH AVE NE		E250104	#########	07:45	No Apparent Injury	0	0	2	0	0	Intersection Related but Not at Intersection	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 70TH PL	11500		200	F	SE	116TH AVE NE		E253954	#########	17:39	Possible Injury	1	0	4	0	0	Intersection Related but Not at Intersection	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 70TH PL	4800		155	F	SE	NE 72ND PL		E638041	#########	08:30	Possible Injury	2	0	2	0	0	Intersection Related but Not at Intersection	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 72ND PL	11500	116TH AVE NE						E252239	#########	11:14	Possible Injury	1	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 72ND PL	11500	116TH AVE NE						E300705	#########	07:15	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Dawn	Entering at angle
City Street	King	Kirkland	NE 72ND PL	11500	116TH AVE NE						E509468	#########	15:45	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 72ND PL	11500	116TH AVE NE						E564519	#########	16:13	No Apparent Injury	0	0	1	0	0	At Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	Linear Curb
City Street	King	Kirkland	NE 72ND PL			200	F	W	116TH AVE NE		E294763	#########	16:25	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Raining	Wet	Dark-Street Lights On	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	NE 75TH ST	12000		165	F	W	122ND AVE NE		E508804	#########	18:00	No Apparent Injury	0	0	1	0	0	Driveway Related but Not at Driveway	Other	Wet	Dark-Street Lights On	Roadway Ditch
City Street	King	Kirkland	NE 80TH ST	11900	120TH AVE NE						E562192	#########	21:20	Possible Injury	1	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Dark-Street Lights On	From opposite direction - one left turn - one straight

OFFICER REPORTED CRASHES THAT OCCURRED *at* OR *in the vicinity of* THE FOLLOWING INTERSECTIONS & ROAD SEGMENTS IN THE CITY OF KIRKLAND

120th AVE @ 85th ST
120th AVE @ 80th ST
SR 405LX01744 (aka 116th AVE, MP 0.17 - 0.22) @ 72nd PL / 70th PL
75th ST FROM 116th AVE TO 122nd AVE
80th ST FROM 116th AVE TO 122nd AVE

01/01/2013 - 12/31/2017

Under 23 U.S. Code § 409 and 23 U.S. Code § 148, safety data, reports, surveys, schedules, lists compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential crash sites, hazardous roadway conditions, or railway-highway crossings are not subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any action for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists, or data.

JURISDICTION	COUNTY	CITY	PRIMARY TRAFFICWAY	BLOCK NUMBER	INTERSECTING TRAFFICWAY	DIST FROM REF POINT	MI or FT	COMP DIR FROM REF POINT	REFERENCE POINT NAME	MILEPOST	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FAT	# VEH	# PEDS	# BIKES	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK
City Street	King	Kirkland	NE 80TH ST	0	120TH AVE NE						E689569	#########	18:04	Possible Injury	1	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	NE 80TH ST	0	120TH AVE NE						E732839	#########	18:50	Possible Injury	1	0	2	0	0	At Intersection and Related	Raining	Wet	Dark-Street Lights On	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 80TH ST	0	122ND AVE NE						E646022	#########	10:30	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Raining	Wet	Daylight	Entering at angle
City Street	King	Kirkland	NE 80TH ST	12200	122ND AVE NE						E691873	#########	22:51	Possible Injury	2	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Dark-Street Lights On	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 80TH ST	11900		350	F	W	120TH AVE NE		E667761	#########	16:20	No Apparent Injury	0	0	3	0	0	Intersection Related but Not at Intersection	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 80TH ST	12200		218	F	E	122ND AVE NE		E443666	#########	11:20	Possible Injury	1	0	3	0	0	Intersection Related but Not at Intersection	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST	11845	120TH AVE NE						E254993	#########	10:16	No Apparent Injury	0	0	2	0	0	At Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	NE 85TH ST		120TH AVE NE						E285160	#########	11:40	Possible Injury	1	0	2	0	0	At Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST		120TH AVE NE						E287624	#########	17:35	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Dark-Street Lights On	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST		120TH AVE NE						E289699	#########	18:45	Possible Injury	1	0	3	0	0	At Intersection and Not Related	Overcast	Wet	Dark-Street Lights On	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST	9900	120TH AVE NE						E292067	#########	16:59	Possible Injury	1	0	2	0	0	At Driveway within Major Intersection	Raining	Wet	Dark-Street Lights On	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST		120TH AVE NE						E313285	#########	16:25	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Raining	Wet	Daylight	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	NE 85TH ST		120TH AVE NE						E324169	#########	13:08	No Apparent Injury	0	0	2	0	0	At Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST	11900	120TH AVE NE						E358522	#########	11:15	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	NE 85TH ST	11900	120TH AVE NE						E369918	#########	18:30	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Overcast	Wet	Dark-Street Lights On	From same direction - both going straight - both moving - rear-end
City Street	King	Kirkland	NE 85TH ST	9900	120TH AVE NE						E377761	#########	10:24	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Raining	Wet	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST	9900	120TH AVE NE						E389901	#########	20:00	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Unknown	Unknown	Dark-Street Lights On	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	NE 85TH ST	11800	120TH AVE NE						E394568	#########	11:29	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Raining	Wet	Daylight	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	NE 85TH ST	11800	120TH AVE NE						E396461	#########	20:08	Possible Injury	1	0	3	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Dark-Street Lights On	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	NE 85TH ST	11800	120TH AVE NE						E406023	#########	12:40	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	NE 85TH ST	9900	120TH AVE NE						E427706	#########	15:45	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	NE 85TH ST	11800	120TH AVE NE						E428376	#########	17:58	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	NE 85TH ST	11800	120TH AVE NE						E437610	#########	12:25	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST	11800	120TH AVE NE						E461119	#########	10:16	No Apparent Injury	0	0	3	0	0	At Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST	11800	120TH AVE NE						E469246	#########	13:00	Possible Injury	1	0	2	0	0	At Intersection and Not Related	Raining	Wet	Daylight	From same direction - both going straight - both moving - rear-end
City Street	King	Kirkland	NE 85TH ST	11800	120TH AVE NE						E473632	#########	15:34	No Apparent Injury	0	0	2	0	0	At Intersection and Not Related	Overcast	Dry	Daylight	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	NE 85TH ST	11800	120TH AVE NE						E493508	#########	07:48	No Apparent Injury	0	0	2	0	0	At Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - all others
City Street	King	Kirkland	NE 85TH ST	11800	120TH AVE NE						E527559	#########	14:34	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Raining	Wet	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST	11800	120TH AVE NE						E530457	#########	14:46	Possible Injury	2	0	3	0	0	At Driveway within Major Intersection	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST	11800	120TH AVE NE						E552594	#########	14:59	Possible Injury	1	0	3	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST	11800	120TH AVE NE						E552595	#########	09:40	No Apparent Injury	0	0	2	0	0	At Driveway within Major Intersection	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	NE 85TH ST	9900	120TH AVE NE						E563425	#########	13:38	No Apparent Injury	0	0	3	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST	11800	120TH AVE NE						E586175	#########	06:38	Suspected Serious Injury	1	0	1	1	0	At Driveway within Major Intersection	Raining	Wet	Dark-Street Lights On	Vehicle turning right hits pedestrian
City Street	King	Kirkland	NE 85TH ST	11800	120TH AVE NE						E587750	#########	12:28	Possible Injury	1	0	2	0	0	At Driveway within Major Intersection	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	NE 85TH ST	0	120TH AVE NE						E674048	#########	08:50	Possible Injury	1	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 85TH ST	0	120TH AVE NE						E674589	#########	20:00	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST	0	120TH AVE NE						E695205	#########	11:19	Possible Injury	1	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 85TH ST	0	120TH AVE NE						E695554	#########	19:40	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 85TH ST	0	120TH AVE NE						E712746	#########	09:44	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
City Street	King	Kirkland	NE 85TH ST			251	F	E	120TH AVE NE		E230927	#########	11:14	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Wet	Daylight	Entering at angle
City Street	King	Kirkland	NE 85TH ST	9800		200	F	W	120TH AVE NE		E279589	#########	15:34	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST			40	F	SW	120TH AVE NE		E318726	#########	15:54	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	NE 85TH ST	5100		208	F	E	120TH AVE NE		E345140	#########	16:45	No Apparent Injury	0	0	2	0	0	At Driveway	Clear or Partly Cloudy	Dry	Daylight	Entering at angle
City Street	King	Kirkland	NE 85TH ST	10500		183	F	W	120TH AVE NE		E476072	#########	13:53	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Raining	Wet	Daylight	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	NE 85TH ST	12200		0.13	M	E	120TH AVE NE		E543601	#########	11:56	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Raining	Wet	Daylight	From same direction - both going straight - both moving - rear-end
City Street	King	Kirkland	NE 85TH ST	12000		129	F	E	120TH AVE NE		E649600	#########	12:28	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end
City Street	King	Kirkland	NE 85TH ST	11800		300	F	W	120TH AVE NE		E655384	#########	16:25	No Apparent Injury	0	0	2	0	0	Not at Intersection and Not Related	Raining	Wet	Daylight	From same direction - both going straight - both moving - sideswipe
City Street	King	Kirkland	NE 85TH ST	11900		70	F	SE	120TH AVE NE		E683620	#########	13:51	No Apparent Injury	0	0	2	0	0	At Driveway	Raining	Wet	Daylight	Entering at angle
City Street	King	Kirkland	NE 85TH ST	0		34	F	S	120TH AVE NE		E747053	#########	13:35	No Apparent Injury	0	0	3	0	0	Intersection Related but Not at Intersection	Raining	Wet	Daylight	From same direction - both going straight - one stopped - rear-end
State Route	King	Kirkland	405LX01744							0.19	E615313	#########	17:59	Possible Injury	2	0	2	0	0	At Driveway within Major Intersection	Overcast	Wet	Dark-Street Lights On	Entering at angle
State Route	King	Kirkland	405LX01744							0.19	E628890	#########	12:14	Possible Injury	2	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
State Route	King	Kirkland	405LX01744							0.19	E632565	#########	19:38	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Dark-Street Lights On	From opposite direction - one left turn - one straight
State Route	King	Kirkland	405LX01744							0.19	E644307	#########	15:09	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Raining	Wet	Daylight	From opposite direction - one left turn - one straight
State Route	King	Kirkland	405LX01744							0.19	E652954	#########	18:31	Possible Injury	1	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
State Route	King	Kirkland	405LX01744							0.19	E731068	#########	09:49	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight
State Route	King	Kirkland	405LX01744							0.19	E734194	#########	18:49	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Clear or Partly Cloudy	Dry	Dark-Street Lights On	From opposite direction - one left turn - one straight
State Route	King	Kirkland	405LX01744							0.19	E736156	#########	21:06	No Apparent Injury	0	0	2	0	0	At Intersection and Related	Raining	Wet	Dark-Street Lights On	From opposite direction - one left turn - one straight

Appendix B

Level of Service Worksheets

2018 Existing AM Peak Hour

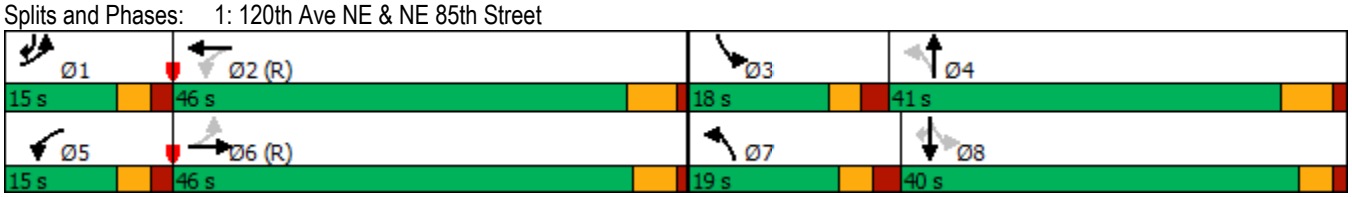
Lanes, Volumes, Timings
1: 120th Ave NE & NE 85th Street

11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	64	1176	173	36	1216	15	135	37	37	13	34	168
Future Volume (vph)	64	1176	173	36	1216	15	135	37	37	13	34	168
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	100		0	60		0	100		240
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			35			30			30	
Link Distance (ft)		511			505			1405			524	
Travel Time (s)		11.6			9.8			31.9			11.9	
Confl. Peds. (#/hr)			3			4	2		3	3		2
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	3%	1%	3%	3%	7%	2%	0%	3%	8%	0%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	1	6		5	2		7	4		3	8	1
Permitted Phases	6			2			4			8		8
Detector Phase	1	6		5	2		7	4		3	8	1
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	15.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	11.0	27.0		11.0	33.5		11.5	35.0		11.5	36.5	11.0
Total Split (s)	15.0	46.0		15.0	46.0		19.0	41.0		18.0	40.0	15.0
Total Split (%)	12.5%	38.3%		12.5%	38.3%		15.8%	34.2%		15.0%	33.3%	12.5%
Yellow Time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	3.0	3.0
All-Red Time (s)	2.0	1.0		2.0	1.0		2.5	1.5		2.5	1.5	2.0
Lost Time Adjust (s)	0.0	-1.0		0.0	-1.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0		5.0	4.5		5.5	6.0		5.5	4.5	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?							Yes				Yes	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 7 (6%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: 120th Ave NE & NE 85th Street



HCM 6th Signalized Intersection Summary
1: 120th Ave NE & NE 85th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	64	1176	173	36	1216	15	135	37	37	13	34	168
Future Volume (veh/h)	64	1176	173	36	1216	15	135	37	37	13	34	168
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1870	1900	1900	1781	1900	1885
Adj Flow Rate, veh/h	68	1251	184	38	1294	16	144	39	39	14	36	179
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	2	0	0	8	0	1
Cap, veh/h	369	1755	257	221	1997	25	348	175	175	262	259	288
Arrive On Green	0.04	0.57	0.56	0.07	1.00	1.00	0.08	0.20	0.20	0.02	0.14	0.14
Sat Flow, veh/h	1767	3085	451	1767	3566	44	1781	869	869	1697	1900	1587
Grp Volume(v), veh/h	68	712	723	38	639	671	144	0	78	14	36	179
Grp Sat Flow(s),veh/h/ln	1767	1763	1773	1767	1763	1847	1781	0	1739	1697	1900	1587
Q Serve(g_s), s	1.9	35.0	35.7	1.1	0.0	0.0	8.1	0.0	4.5	0.8	2.0	12.5
Cycle Q Clear(g_c), s	1.9	35.0	35.7	1.1	0.0	0.0	8.1	0.0	4.5	0.8	2.0	12.5
Prop In Lane	1.00		0.25	1.00		0.02	1.00		0.50	1.00		1.00
Lane Grp Cap(c), veh/h	369	1003	1009	221	987	1035	348	0	350	262	259	288
V/C Ratio(X)	0.18	0.71	0.72	0.17	0.65	0.65	0.41	0.00	0.22	0.05	0.14	0.62
Avail Cap(c_a), veh/h	437	1003	1009	304	987	1035	400	0	507	408	562	541
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	0.78	0.00	0.78	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.2	18.7	18.9	15.4	0.0	0.0	38.1	0.0	40.0	43.2	45.6	45.3
Incr Delay (d2), s/veh	0.1	4.3	4.4	0.1	2.9	2.7	0.2	0.0	0.1	0.0	0.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	14.9	15.3	0.4	0.8	0.8	3.5	0.0	1.9	0.4	1.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.2	23.0	23.3	15.5	2.9	2.7	38.3	0.0	40.1	43.2	45.7	46.1
LnGrp LOS	B	C	C	B	A	A	D	A	D	D	D	D
Approach Vol, veh/h		1503			1348			222			229	
Approach Delay, s/veh		22.6			3.2			39.0			45.9	
Approach LOS		C			A			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	71.7	7.7	30.2	9.3	72.8	15.5	22.4
Change Period (Y+Rc), s	5.0	5.5	5.5	6.0	5.0	* 5.5	5.5	* 6
Max Green Setting (Gmax), s	10.0	40.5	12.5	35.0	10.0	* 41	13.5	* 36
Max Q Clear Time (g_c+I1), s	3.9	2.0	2.8	6.5	3.1	37.7	10.1	14.5
Green Ext Time (p_c), s	0.0	3.4	0.0	0.1	0.0	1.6	0.1	0.2

Intersection Summary	
HCM 6th Ctrl Delay	17.4
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
2: LWHS/120th Ave NE & NE 80th Street

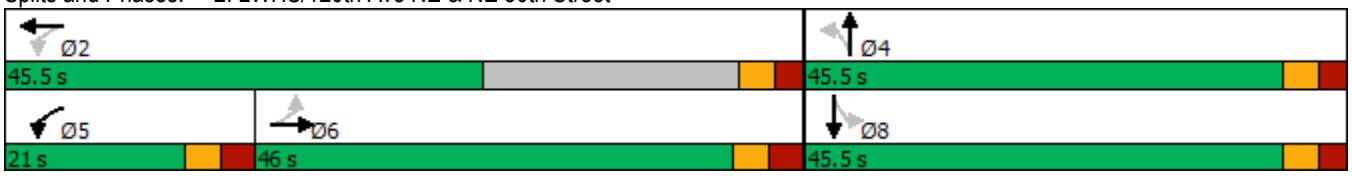
11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	77	60	233	206	39	57	138	180	47	244	37
Future Volume (vph)	44	77	60	233	206	39	57	138	180	47	244	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		660			516			244			1405	
Travel Time (s)		18.0			14.1			6.7			38.3	
Confl. Peds. (#/hr)	8		3	3		8	43		38	38		43
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Heavy Vehicles (%)	2%	5%	0%	1%	3%	3%	0%	0%	1%	9%	0%	3%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	29.0	29.0		12.0	25.5		32.5	32.5		26.5	26.5	
Total Split (s)	46.0	46.0		21.0	45.5		45.5	45.5		45.5	45.5	
Total Split (%)	40.9%	40.9%		18.7%	40.4%		40.4%	40.4%		40.4%	40.4%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	5.5		5.5	5.5			5.5	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 112.5
Actuated Cycle Length: 86.1
Natural Cycle: 80
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: LWHS/120th Ave NE & NE 80th Street



HCM 6th Signalized Intersection Summary
2: LWHS/120th Ave NE & NE 80th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	77	60	233	206	39	57	138	180	47	244	37
Future Volume (veh/h)	44	77	60	233	206	39	57	138	180	47	244	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.99		0.99	1.00		0.95	0.99		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1826	1826	1885	1856	1856	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	68	118	92	358	317	60	88	212	277	72	375	57
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Percent Heavy Veh, %	2	5	5	1	3	3	0	0	0	0	0	0
Cap, veh/h	259	165	129	469	640	121	261	320	418	97	432	61
Arrive On Green	0.18	0.18	0.18	0.18	0.42	0.42	0.44	0.44	0.44	0.44	0.44	0.44
Sat Flow, veh/h	992	940	733	1795	1514	287	971	725	947	110	978	139
Grp Volume(v), veh/h	68	0	210	358	0	377	88	0	489	504	0	0
Grp Sat Flow(s),veh/h/ln	992	0	1674	1795	0	1801	971	0	1672	1226	0	0
Q Serve(g_s), s	5.1	0.0	10.0	13.2	0.0	13.0	0.0	0.0	19.6	15.0	0.0	0.0
Cycle Q Clear(g_c), s	5.1	0.0	10.0	13.2	0.0	13.0	15.8	0.0	19.6	34.6	0.0	0.0
Prop In Lane	1.00		0.44	1.00		0.16	1.00		0.57	0.14		0.11
Lane Grp Cap(c), veh/h	259	0	294	469	0	762	261	0	738	590	0	0
V/C Ratio(X)	0.26	0.00	0.72	0.76	0.00	0.50	0.34	0.00	0.66	0.85	0.00	0.00
Avail Cap(c_a), veh/h	553	0	789	469	0	849	290	0	789	638	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	31.0	0.0	33.0	21.9	0.0	17.9	17.7	0.0	18.7	23.3	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	1.2	6.6	0.0	0.2	0.9	0.0	2.1	9.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	4.1	6.2	0.0	5.3	1.3	0.0	7.7	11.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.2	0.0	34.2	28.4	0.0	18.0	18.6	0.0	20.8	32.9	0.0	0.0
LnGrp LOS	C	A	C	C	A	B	B	A	C	C	A	A
Approach Vol, veh/h		278			735			577			504	
Approach Delay, s/veh		33.5			23.1			20.4			32.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		41.9		42.9	21.0	20.9		42.9				
Change Period (Y+Rc), s		* 6		5.5	6.0	6.0		5.5				
Max Green Setting (Gmax), s		* 40		40.0	15.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s		15.0		21.6	15.2	12.0		36.6				
Green Ext Time (p_c), s		1.7		4.6	0.0	1.1		0.9				

Intersection Summary	
HCM 6th Ctrl Delay	26.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
3: NE 80th Street & 122nd Ave NE

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	19	281	413	41	38	63
Future Volume (vph)	19	281	413	41	38	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		516	180		1399	
Travel Time (s)		14.1	4.9		38.2	
Confl. Peds. (#/hr)	21			23	23	21
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	3%	2%	2%	3%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
3: NE 80th Street & 122nd Ave NE

11/12/2018

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	281	413	41	38	63
Future Vol, veh/h	19	281	413	41	38	63
Conflicting Peds, #/hr	21	0	0	23	23	21
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	0	3	2	2	3	0
Mvmt Flow	24	356	523	52	48	80

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	598	0	-	0	999	593
Stage 1	-	-	-	-	572	-
Stage 2	-	-	-	-	427	-
Critical Hdwy	4.1	-	-	-	6.43	6.2
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.3
Pot Cap-1 Maneuver	989	-	-	-	269	509
Stage 1	-	-	-	-	563	-
Stage 2	-	-	-	-	656	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	970	-	-	-	251	491
Mov Cap-2 Maneuver	-	-	-	-	251	-
Stage 1	-	-	-	-	535	-
Stage 2	-	-	-	-	644	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	20.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	970	-	-	-	361
HCM Lane V/C Ratio	0.025	-	-	-	0.354
HCM Control Delay (s)	8.8	0	-	-	20.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.6

Lanes, Volumes, Timings
4: 116th Ave NE & NE 75th Street

11/12/2018

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	80	13	168	86	4	324
Future Volume (vph)	80	13	168	86	4	324
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25		25			25
Link Distance (ft)	742		296			360
Travel Time (s)	20.2		8.1			9.8
Confl. Peds. (#/hr)	2	2		2	2	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
4: 116th Ave NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	2.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	80	13	168	86	4	324
Future Vol, veh/h	80	13	168	86	4	324
Conflicting Peds, #/hr	2	2	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	73	73	73	73	73	73
Heavy Vehicles, %	1	0	2	0	0	3
Mvmt Flow	110	18	230	118	5	444

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	747	293	0	0	350	0
Stage 1	291	-	-	-	-	-
Stage 2	456	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	382	751	-	-	1220	-
Stage 1	761	-	-	-	-	-
Stage 2	640	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	379	748	-	-	1218	-
Mov Cap-2 Maneuver	379	-	-	-	-	-
Stage 1	759	-	-	-	-	-
Stage 2	636	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	17.8	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	407	1218	-
HCM Lane V/C Ratio	-	-	0.313	0.004	-
HCM Control Delay (s)	-	-	17.8	8	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.3	0	-

Lanes, Volumes, Timings
5: NE 75th Street & LWHS West Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	67	29	47	74	35	46
Future Volume (vph)	67	29	47	74	35	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		742	612		229	
Travel Time (s)		20.2	16.7		6.2	
Confl. Peds. (#/hr)	2			2	2	2
Peak Hour Factor	0.42	0.42	0.42	0.42	0.42	0.42
Heavy Vehicles (%)	0%	0%	0%	0%	6%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM 6th TWSC
5: NE 75th Street & LWHS West Driveway

11/12/2018

Intersection	
Int Delay, s/veh	5.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	67	29	47	74	35	46
Future Vol, veh/h	67	29	47	74	35	46
Conflicting Peds, #/hr	2	0	0	2	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	42	42	42	42	42	42
Heavy Vehicles, %	0	0	0	0	6	2
Mvmt Flow	160	69	112	176	83	110

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	290	0	-	0	593	204
Stage 1	-	-	-	-	202	-
Stage 2	-	-	-	-	391	-
Critical Hdwy	4.1	-	-	-	6.46	6.22
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.2	-	-	-	3.554	3.318
Pot Cap-1 Maneuver	1283	-	-	-	462	837
Stage 1	-	-	-	-	822	-
Stage 2	-	-	-	-	675	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1281	-	-	-	401	834
Mov Cap-2 Maneuver	-	-	-	-	401	-
Stage 1	-	-	-	-	713	-
Stage 2	-	-	-	-	674	-

Approach	EB	WB	SB
HCM Control Delay, s	5.7	0	14.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1281	-	-	-	569
HCM Lane V/C Ratio	0.125	-	-	-	0.339
HCM Control Delay (s)	8.2	0	-	-	14.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.4	-	-	-	1.5

Lanes, Volumes, Timings
6: 120th Ave NE & NE 75th Street

11/12/2018

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	81	51	92	63	46	25
Future Volume (vph)	81	51	92	63	46	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25			25	25	
Link Distance (ft)	612			123	328	
Travel Time (s)	16.7			3.4	8.9	
Confl. Peds. (#/hr)		63	47		63	47
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	5.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	81	51	92	63	46	25
Future Vol, veh/h	81	51	92	63	46	25
Conflicting Peds, #/hr	0	63	47	0	63	47
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	3	0	0	0	0	0
Mvmt Flow	116	73	131	90	66	36

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	252	0	631	263
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	415	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1325	-	448	781
Stage 1	-	-	-	-	825	-
Stage 2	-	-	-	-	671	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1255	-	358	711
Mov Cap-2 Maneuver	-	-	-	-	358	-
Stage 1	-	-	-	-	782	-
Stage 2	-	-	-	-	566	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.9	15.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	434	-	-	1255	-
HCM Lane V/C Ratio	0.234	-	-	0.105	-
HCM Control Delay (s)	15.8	-	-	8.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.3	-

Lanes, Volumes, Timings
7: NE 75th Street & LWHS East Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	19	87	147	58	22	8
Future Volume (vph)	19	87	147	58	22	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		123	513		219	
Travel Time (s)		3.4	14.0		6.0	
Confl. Peds. (#/hr)	47			9	9	47
Peak Hour Factor	0.59	0.59	0.59	0.59	0.59	0.59
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM 6th TWSC
7: NE 75th Street & LWHS East Driveway

11/12/2018

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	87	147	58	22	8
Future Vol, veh/h	19	87	147	58	22	8
Conflicting Peds, #/hr	47	0	0	9	9	47
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	59	59	59	59	59	59
Heavy Vehicles, %	0	2	0	0	0	0
Mvmt Flow	32	147	249	98	37	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	394	0	-	0	565	392
Stage 1	-	-	-	-	345	-
Stage 2	-	-	-	-	220	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1176	-	-	-	490	661
Stage 1	-	-	-	-	722	-
Stage 2	-	-	-	-	821	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1130	-	-	-	439	610
Mov Cap-2 Maneuver	-	-	-	-	439	-
Stage 1	-	-	-	-	672	-
Stage 2	-	-	-	-	789	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1130	-	-	-	474
HCM Lane V/C Ratio	0.028	-	-	-	0.107
HCM Control Delay (s)	8.3	0	-	-	13.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Lanes, Volumes, Timings
8: 122nd Ave NE & NE 75th Street

11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	22	39	3	37	2	46	41	0	3	77	122
Future Volume (vph)	46	22	39	3	37	2	46	41	0	3	77	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		513			178			239			1295	
Travel Time (s)		14.0			4.9			6.5			35.3	
Confl. Peds. (#/hr)	40		15	3		28	15		3	28		40
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Heavy Vehicles (%)	4%	0%	0%	0%	0%	0%	2%	0%	0%	33%	0%	2%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM 6th TWSC
8: 122nd Ave NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	46	22	39	3	37	2	46	41	0	3	77	122
Future Vol, veh/h	46	22	39	3	37	2	46	41	0	3	77	122
Conflicting Peds, #/hr	40	0	15	3	0	28	15	0	3	28	0	40
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	67	67	67	67	67	67	67	67	67
Heavy Vehicles, %	4	0	0	0	0	0	2	0	0	33	0	2
Mvmt Flow	69	33	58	4	55	3	69	61	0	4	115	182

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	522	481	261	502	572	129	337	0	0	89	0	0
Stage 1	254	254	-	227	227	-	-	-	-	-	-	-
Stage 2	268	227	-	275	345	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.5	6.2	7.1	6.5	6.2	4.12	-	-	4.43	-	-
Critical Hdwy Stg 1	6.14	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4	3.3	3.5	4	3.3	2.218	-	-	2.497	-	-
Pot Cap-1 Maneuver	462	487	783	483	433	926	1222	-	-	1332	-	-
Stage 1	746	701	-	780	720	-	-	-	-	-	-	-
Stage 2	733	720	-	736	640	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	365	431	747	385	383	874	1181	-	-	1301	-	-
Mov Cap-2 Maneuver	365	431	-	385	383	-	-	-	-	-	-	-
Stage 1	678	675	-	716	661	-	-	-	-	-	-	-
Stage 2	608	661	-	635	616	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.7	15.9	4.4	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1181	-	-	467	394	1301	-	-
HCM Lane V/C Ratio	0.058	-	-	0.342	0.159	0.003	-	-
HCM Control Delay (s)	8.2	0	-	16.7	15.9	7.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.5	0.6	0	-	-

2018 Existing Afternoon Peak Hour

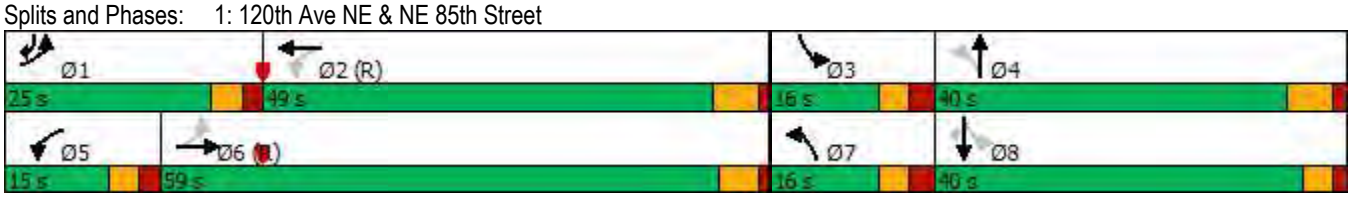
Lanes, Volumes, Timings
1: 120th Ave NE & NE 85th Street

11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	211	1190	103	22	1096	51	222	113	50	83	65	354
Future Volume (vph)	211	1190	103	22	1096	51	222	113	50	83	65	354
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	100		0	60		0	100		240
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			35			30			30	
Link Distance (ft)		511			505			1405			524	
Travel Time (s)		11.6			9.8			31.9			11.9	
Confl. Peds. (#/hr)	1		21	21		1	6		5	5		6
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	3%	4%	0%	2%	2%	2%	2%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	1	6		5	2		7	4		3	8	1
Permitted Phases	6			2			4			8		8
Detector Phase	1	6		5	2		7	4		3	8	1
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	15.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	11.0	27.0		11.0	33.5		11.5	35.0		11.5	36.5	11.0
Total Split (s)	25.0	59.0		15.0	49.0		16.0	40.0		16.0	40.0	25.0
Total Split (%)	19.2%	45.4%		11.5%	37.7%		12.3%	30.8%		12.3%	30.8%	19.2%
Yellow Time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	3.0	3.0
All-Red Time (s)	2.0	1.0		2.0	1.0		2.5	1.5		2.5	1.5	2.0
Lost Time Adjust (s)	0.0	-1.0		0.0	-1.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0		5.0	4.5		5.5	6.0		5.5	4.5	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?							Yes				Yes	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 120 (92%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: 120th Ave NE & NE 85th Street



HCM 6th Signalized Intersection Summary
1: 120th Ave NE & NE 85th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	211	1190	103	22	1096	51	222	113	50	83	65	354
Future Volume (veh/h)	211	1190	103	22	1096	51	222	113	50	83	65	354
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1856	1856	1900	1870	1870	1870	1870	1870	1900	1870	1885
Adj Flow Rate, veh/h	227	1280	111	24	1178	55	239	122	54	89	70	381
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	3	3	0	2	2	2	2	2	0	2	1
Cap, veh/h	270	1623	140	168	1510	70	392	326	144	372	441	509
Arrive On Green	0.08	0.50	0.49	0.03	0.44	0.43	0.08	0.27	0.27	0.05	0.24	0.24
Sat Flow, veh/h	1795	3277	283	1810	3452	161	1781	1226	543	1810	1870	1585
Grp Volume(v), veh/h	227	687	704	24	606	627	239	0	176	89	70	381
Grp Sat Flow(s),veh/h/ln	1795	1763	1797	1810	1777	1837	1781	0	1768	1810	1870	1585
Q Serve(g_s), s	8.8	41.9	42.3	0.9	37.8	37.9	10.5	0.0	10.5	4.8	3.9	28.0
Cycle Q Clear(g_c), s	8.8	41.9	42.3	0.9	37.8	37.9	10.5	0.0	10.5	4.8	3.9	28.0
Prop In Lane	1.00		0.16	1.00		0.09	1.00		0.31	1.00		1.00
Lane Grp Cap(c), veh/h	270	873	890	168	777	803	392	0	470	372	441	509
V/C Ratio(X)	0.84	0.79	0.79	0.14	0.78	0.78	0.61	0.00	0.37	0.24	0.16	0.75
Avail Cap(c_a), veh/h	394	873	890	259	777	803	392	0	470	427	511	568
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	0.82	0.00	0.82	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.9	27.1	27.3	24.4	31.2	31.3	36.1	0.0	38.9	35.0	39.5	39.5
Incr Delay (d2), s/veh	7.0	7.1	7.1	0.1	6.7	6.5	1.6	0.0	0.2	0.1	0.1	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	19.0	19.6	0.4	17.3	17.9	1.5	0.0	4.6	2.2	1.8	11.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.9	34.2	34.4	24.5	37.9	37.8	37.7	0.0	39.0	35.1	39.5	43.6
LnGrp LOS	C	C	C	C	D	D	D	A	D	D	D	D
Approach Vol, veh/h		1618			1257			415			540	
Approach Delay, s/veh		34.3			37.6			38.3			41.6	
Approach LOS		C			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	61.4	12.1	40.6	8.5	68.9	16.0	36.6
Change Period (Y+Rc), s	5.0	5.5	5.5	6.0	5.0	* 5.5	5.5	* 6
Max Green Setting (Gmax), s	20.0	43.5	10.5	34.0	10.0	* 54	10.5	* 36
Max Q Clear Time (g_c+I1), s	10.8	39.9	6.8	12.5	2.9	44.3	12.5	30.0
Green Ext Time (p_c), s	0.2	1.3	0.0	0.2	0.0	3.0	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	36.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
2: LWHS/120th Ave NE & NE 80th Street

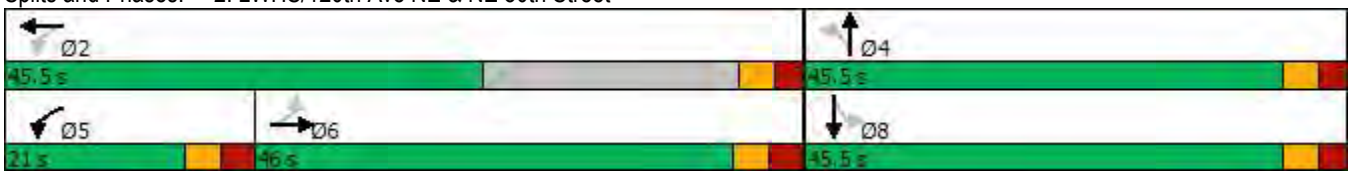
11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	200	33	71	146	95	27	156	133	56	64	61
Future Volume (vph)	113	200	33	71	146	95	27	156	133	56	64	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		660			516			244			1405	
Travel Time (s)		18.0			14.1			6.7			38.3	
Confl. Peds. (#/hr)	34		41	41		34	95		144	144		95
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	2%	2%	0%	4%	4%	1%	0%	2%	0%	2%	2%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	29.0	29.0		12.0	25.5		32.5	32.5		26.5	26.5	
Total Split (s)	46.0	46.0		21.0	45.5		45.5	45.5		45.5	45.5	
Total Split (%)	40.9%	40.9%		18.7%	40.4%		40.4%	40.4%		40.4%	40.4%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	5.5		5.5	5.5			5.5	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 112.5
Actuated Cycle Length: 64.6
Natural Cycle: 75
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: LWHS/120th Ave NE & NE 80th Street



HCM 6th Signalized Intersection Summary
2: LWHS/120th Ave NE & NE 80th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	200	33	71	146	95	27	156	133	56	64	61
Future Volume (veh/h)	113	200	33	71	146	95	27	156	133	56	64	61
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.95		0.92	0.97		0.95	0.93		0.82	0.91		0.82
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1900	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	130	230	38	82	168	109	31	179	153	64	74	70
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	4	4	4	0	2	2	2	2	2
Cap, veh/h	391	417	69	382	440	285	477	332	283	163	179	138
Arrive On Green	0.27	0.27	0.27	0.07	0.43	0.43	0.40	0.40	0.40	0.40	0.40	0.40
Sat Flow, veh/h	1045	1544	255	1753	1020	662	1174	838	716	233	453	348
Grp Volume(v), veh/h	130	0	268	82	0	277	31	0	332	208	0	0
Grp Sat Flow(s),veh/h/ln	1045	0	1800	1753	0	1683	1174	0	1554	1034	0	0
Q Serve(g_s), s	6.9	0.0	8.5	2.0	0.0	7.4	0.0	0.0	10.9	3.1	0.0	0.0
Cycle Q Clear(g_c), s	6.9	0.0	8.5	2.0	0.0	7.4	1.8	0.0	10.9	14.0	0.0	0.0
Prop In Lane	1.00		0.14	1.00		0.39	1.00		0.46	0.31		0.34
Lane Grp Cap(c), veh/h	391	0	486	382	0	725	477	0	615	480	0	0
V/C Ratio(X)	0.33	0.00	0.55	0.21	0.00	0.38	0.07	0.00	0.54	0.43	0.00	0.00
Avail Cap(c_a), veh/h	739	0	1085	655	0	1014	720	0	937	748	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	20.2	0.0	20.8	14.7	0.0	12.9	12.7	0.0	15.4	15.4	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.4	0.1	0.0	0.1	0.1	0.0	0.9	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	3.5	0.8	0.0	2.6	0.3	0.0	3.7	2.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	0.0	21.1	14.8	0.0	13.0	12.7	0.0	16.3	15.6	0.0	0.0
LnGrp LOS	C	A	C	B	A	B	B	A	B	B	A	A
Approach Vol, veh/h		398			359			363			208	
Approach Delay, s/veh		20.9			13.4			16.0			15.6	
Approach LOS		C			B			B			B	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		34.6		31.8	10.7	23.9		31.8				
Change Period (Y+Rc), s		* 6		5.5	6.0	6.0		5.5				
Max Green Setting (Gmax), s		* 40		40.0	15.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s		9.4		12.9	4.0	10.5		16.0				
Green Ext Time (p_c), s		1.3		3.2	0.1	1.5		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			16.7									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
3: NE 80th Street & 122nd Ave NE

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	34	353	277	44	46	35
Future Volume (vph)	34	353	277	44	46	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		516	180		1399	
Travel Time (s)		14.1	4.9		38.2	
Confl. Peds. (#/hr)	57			56	56	57
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	3%	2%	2%	3%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
3: NE 80th Street & 122nd Ave NE

11/12/2018

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	34	353	277	44	46	35
Future Vol, veh/h	34	353	277	44	46	35
Conflicting Peds, #/hr	57	0	0	56	56	57
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	1	3	2	2	3
Mvmt Flow	37	380	298	47	49	38

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	402	0	-	0	889	436
Stage 1	-	-	-	-	379	-
Stage 2	-	-	-	-	510	-
Critical Hdwy	4.1	-	-	-	6.42	6.23
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.327
Pot Cap-1 Maneuver	1168	-	-	-	314	618
Stage 1	-	-	-	-	692	-
Stage 2	-	-	-	-	603	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1113	-	-	-	273	561
Mov Cap-2 Maneuver	-	-	-	-	273	-
Stage 1	-	-	-	-	632	-
Stage 2	-	-	-	-	575	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	18.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1113	-	-	-	351
HCM Lane V/C Ratio	0.033	-	-	-	0.248
HCM Control Delay (s)	8.3	0	-	-	18.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1

Lanes, Volumes, Timings
4: 116th Ave NE & NE 75th Street

11/12/2018

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	117	11	344	47	3	233
Future Volume (vph)	117	11	344	47	3	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25		25			25
Link Distance (ft)	742		296			360
Travel Time (s)	20.2		8.1			9.8
Confl. Peds. (#/hr)	8	13		8	13	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	0%	2%	2%	0%	2%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
4: 116th Ave NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	3.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	117	11	344	47	3	233
Future Vol, veh/h	117	11	344	47	3	233
Conflicting Peds, #/hr	8	13	0	8	13	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	0	2	2	0	2
Mvmt Flow	133	13	391	53	3	265

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	710	444	0	0	457	0
Stage 1	431	-	-	-	-	-
Stage 2	279	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	402	618	-	-	1114	-
Stage 1	657	-	-	-	-	-
Stage 2	770	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	394	605	-	-	1102	-
Mov Cap-2 Maneuver	394	-	-	-	-	-
Stage 1	650	-	-	-	-	-
Stage 2	762	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.7	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	406	1102	-
HCM Lane V/C Ratio	-	-	0.358	0.003	-
HCM Control Delay (s)	-	-	18.7	8.3	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.6	0	-

Lanes, Volumes, Timings
5: NE 75th Street & LWHS West Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	17	35	46	7	87	88
Future Volume (vph)	17	35	46	7	87	88
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		742	612		229	
Travel Time (s)		20.2	16.7		6.2	
Confl. Peds. (#/hr)	11			8	8	11
Peak Hour Factor	0.58	0.58	0.58	0.58	0.58	0.58
Heavy Vehicles (%)	0%	3%	0%	0%	3%	1%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
5: NE 75th Street & LWHS West Driveway

11/12/2018

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	35	46	7	87	88
Future Vol, veh/h	17	35	46	7	87	88
Conflicting Peds, #/hr	11	0	0	8	8	11
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	58	58	58	58	58	58
Heavy Vehicles, %	0	3	0	0	3	1
Mvmt Flow	29	60	79	12	150	152

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	102	0	-	0	222	107
Stage 1	-	-	-	-	96	-
Stage 2	-	-	-	-	126	-
Critical Hdwy	4.1	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	1503	-	-	-	764	950
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	897	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1489	-	-	-	735	933
Mov Cap-2 Maneuver	-	-	-	-	735	-
Stage 1	-	-	-	-	898	-
Stage 2	-	-	-	-	889	-

Approach	EB	WB	SB
HCM Control Delay, s	2.4	0	11.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1489	-	-	-	823
HCM Lane V/C Ratio	0.02	-	-	-	0.367
HCM Control Delay (s)	7.5	0	-	-	11.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	1.7

Lanes, Volumes, Timings
6: 120th Avenue NE & NE 75th Street

11/12/2018

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	122	52	60	26	15	49
Future Volume (vph)	122	52	60	26	15	49
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25			25	25	
Link Distance (ft)	612			123	299	
Travel Time (s)	16.7			3.4	8.2	
Confl. Peds. (#/hr)		101	128		101	128
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
6: 120th Avenue NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	4.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	122	52	60	26	15	49
Future Vol, veh/h	122	52	60	26	15	49
Conflicting Peds, #/hr	0	101	128	0	101	128
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	67	67	67	67	67	67
Heavy Vehicles, %	3	0	0	0	0	0
Mvmt Flow	182	78	90	39	22	73

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	388	0	669	477
Stage 1	-	-	-	-	349	-
Stage 2	-	-	-	-	320	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1182	-	426	592
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	741	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1056	-	318	472
Mov Cap-2 Maneuver	-	-	-	-	318	-
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	619	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.1	15.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	424	-	-	1056	-
HCM Lane V/C Ratio	0.225	-	-	0.085	-
HCM Control Delay (s)	15.9	-	-	8.7	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.3	-

Lanes, Volumes, Timings
7: NE 75th Street & LWHS East Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	20	151	77	20	29	12
Future Volume (vph)	20	151	77	20	29	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		123	513		219	
Travel Time (s)		3.4	14.0		6.0	
Confl. Peds. (#/hr)	115			5	5	115
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
7: NE 75th Street & LWHS East Driveway

11/12/2018

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	151	77	20	29	12
Future Vol, veh/h	20	151	77	20	29	12
Conflicting Peds, #/hr	115	0	0	5	5	115
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	3	0	0	0	0
Mvmt Flow	29	222	113	29	43	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	257	0	-	0	528	358
Stage 1	-	-	-	-	243	-
Stage 2	-	-	-	-	285	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1320	-	-	-	514	691
Stage 1	-	-	-	-	802	-
Stage 2	-	-	-	-	768	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1194	-	-	-	408	565
Mov Cap-2 Maneuver	-	-	-	-	408	-
Stage 1	-	-	-	-	705	-
Stage 2	-	-	-	-	694	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	14.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1194	-	-	-	444
HCM Lane V/C Ratio	0.025	-	-	-	0.136
HCM Control Delay (s)	8.1	0	-	-	14.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Lanes, Volumes, Timings
8: 122nd Ave NE & NE 75th Street

11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	104	34	31	2	17	2	32	65	3	8	54	66
Future Volume (vph)	104	34	31	2	17	2	32	65	3	8	54	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		513			178			239			1295	
Travel Time (s)		14.0			4.9			6.5			35.3	
Confl. Peds. (#/hr)	59		16	6		49	16		6	49		59
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	1%	3%	0%	0%	6%	0%	0%	2%	0%	0%	2%	5%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM 6th TWSC
8: 122nd Ave NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	8.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	104	34	31	2	17	2	32	65	3	8	54	66
Future Vol, veh/h	104	34	31	2	17	2	32	65	3	8	54	66
Conflicting Peds, #/hr	59	0	16	6	0	49	16	0	6	49	0	59
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	1	3	0	0	6	0	0	2	0	0	2	5
Mvmt Flow	127	41	38	2	21	2	39	79	4	10	66	80

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	415	395	181	390	433	189	205	0	0	132	0	0
Stage 1	185	185	-	208	208	-	-	-	-	-	-	-
Stage 2	230	210	-	182	225	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.53	6.2	7.1	6.56	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.11	5.53	-	6.1	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.53	-	6.1	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.027	3.3	3.5	4.054	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	550	540	867	573	510	858	1378	-	-	1466	-	-
Stage 1	819	745	-	799	722	-	-	-	-	-	-	-
Stage 2	775	727	-	824	710	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	464	474	813	468	447	783	1310	-	-	1406	-	-
Mov Cap-2 Maneuver	464	474	-	468	447	-	-	-	-	-	-	-
Stage 1	754	703	-	742	671	-	-	-	-	-	-	-
Stage 2	690	675	-	724	670	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.9	13.1	2.5	0.5
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1310	-	-	506	468	1406	-	-
HCM Lane V/C Ratio	0.03	-	-	0.407	0.055	0.007	-	-
HCM Control Delay (s)	7.8	0	-	16.9	13.1	7.6	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2	0.2	0	-	-

2018 Existing PM Peak Hour

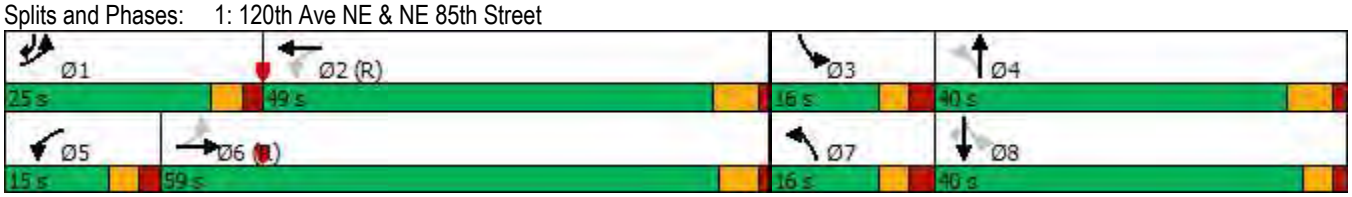
Lanes, Volumes, Timings
1: 120th Ave NE & NE 85th Street

11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	1429	98	12	1190	52	263	115	42	59	64	305
Future Volume (vph)	200	1429	98	12	1190	52	263	115	42	59	64	305
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	100		0	60		0	100		240
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			35			30			30	
Link Distance (ft)		511			505			1405			524	
Travel Time (s)		11.6			9.8			31.9			11.9	
Confl. Peds. (#/hr)	9		5	5		9	9		9	9		9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	2%	8%	1%	0%	1%	0%	2%	0%	0%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	1	6		5	2		7	4		3	8	1
Permitted Phases	6			2			4			8		8
Detector Phase	1	6		5	2		7	4		3	8	1
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	15.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	11.0	27.0		11.0	33.5		11.5	35.0		11.5	36.5	11.0
Total Split (s)	25.0	59.0		15.0	49.0		16.0	40.0		16.0	40.0	25.0
Total Split (%)	19.2%	45.4%		11.5%	37.7%		12.3%	30.8%		12.3%	30.8%	19.2%
Yellow Time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	3.0	3.0
All-Red Time (s)	2.0	1.0		2.0	1.0		2.5	1.5		2.5	1.5	2.0
Lost Time Adjust (s)	0.0	-1.0		0.0	-1.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0		5.0	4.5		5.5	6.0		5.5	4.5	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?							Yes				Yes	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 120 (92%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: 120th Ave NE & NE 85th Street



HCM 6th Signalized Intersection Summary
1: 120th Ave NE & NE 85th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	1429	98	12	1190	52	263	115	42	59	64	305
Future Volume (veh/h)	200	1429	98	12	1190	52	263	115	42	59	64	305
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1885	1885	1781	1885	1885	1885	1900	1900	1900	1900	1885
Adj Flow Rate, veh/h	211	1504	103	13	1253	55	277	121	44	62	67	321
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	1	8	1	1	1	0	0	0	0	1
Cap, veh/h	262	1793	122	127	1639	72	384	335	122	348	405	457
Arrive On Green	0.08	0.53	0.52	0.02	0.47	0.46	0.08	0.25	0.25	0.04	0.21	0.21
Sat Flow, veh/h	1810	3400	232	1697	3494	153	1795	1325	482	1810	1900	1577
Grp Volume(v), veh/h	211	788	819	13	642	666	277	0	165	62	67	321
Grp Sat Flow(s),veh/h/ln	1810	1791	1841	1697	1791	1856	1795	0	1807	1810	1900	1577
Q Serve(g_s), s	7.7	48.3	49.2	0.5	38.5	38.7	10.5	0.0	9.8	3.4	3.7	23.6
Cycle Q Clear(g_c), s	7.7	48.3	49.2	0.5	38.5	38.7	10.5	0.0	9.8	3.4	3.7	23.6
Prop In Lane	1.00		0.13	1.00		0.08	1.00		0.27	1.00		1.00
Lane Grp Cap(c), veh/h	262	944	971	127	840	871	384	0	456	348	405	457
V/C Ratio(X)	0.80	0.83	0.84	0.10	0.76	0.77	0.72	0.00	0.36	0.18	0.17	0.70
Avail Cap(c_a), veh/h	404	944	971	228	840	871	384	0	473	420	519	551
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	0.93	0.00	0.93	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.0	25.9	26.2	24.8	28.6	28.6	39.8	0.0	40.0	37.5	41.7	41.3
Incr Delay (d2), s/veh	3.3	8.6	8.9	0.1	5.7	5.6	5.3	0.0	0.2	0.1	0.1	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	22.2	23.3	0.2	17.4	18.1	3.5	0.0	4.4	1.6	1.8	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.3	34.6	35.1	24.9	34.3	34.2	45.1	0.0	40.1	37.6	41.8	43.4
LnGrp LOS	C	C	D	C	C	C	D	A	D	D	D	D
Approach Vol, veh/h		1818			1321			442			450	
Approach Delay, s/veh		34.2			34.1			43.2			42.4	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.8	65.5	10.9	38.8	7.2	73.1	16.0	33.7
Change Period (Y+Rc), s	5.0	5.5	5.5	6.0	5.0	* 5.5	5.5	* 6
Max Green Setting (Gmax), s	20.0	43.5	10.5	34.0	10.0	* 54	10.5	* 36
Max Q Clear Time (g_c+I1), s	9.7	40.7	5.4	11.8	2.5	51.2	12.5	25.6
Green Ext Time (p_c), s	0.1	1.2	0.0	0.2	0.0	1.5	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	36.1
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
2: LWHS/120th Ave NE & NE 80th Street

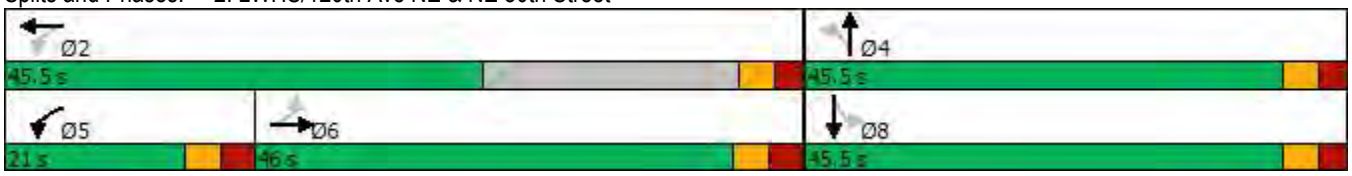
11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	434	10	38	171	221	7	28	25	86	25	51
Future Volume (vph)	169	434	10	38	171	221	7	28	25	86	25	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		660			516			244			1405	
Travel Time (s)		18.0			14.1			6.7			38.3	
Confl. Peds. (#/hr)	1		6	6		1	3		8	8		3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	0%	3%	2%	1%	14%	4%	4%	1%	4%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	29.0	29.0		12.0	25.5		32.5	32.5		26.5	26.5	
Total Split (s)	46.0	46.0		21.0	45.5		45.5	45.5		45.5	45.5	
Total Split (%)	40.9%	40.9%		18.7%	40.4%		40.4%	40.4%		40.4%	40.4%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	5.5		5.5	5.5			5.5	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 112.5
Actuated Cycle Length: 49.4
Natural Cycle: 75
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: LWHS/120th Ave NE & NE 80th Street



HCM 6th Signalized Intersection Summary
2: LWHS/120th Ave NE & NE 80th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	434	10	38	171	221	7	28	25	86	25	51
Future Volume (veh/h)	169	434	10	38	171	221	7	28	25	86	25	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.98	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1856	1870	1870	1693	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	178	457	11	40	180	233	7	29	26	91	26	54
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	3	2	2	14	4	4	4	4	4
Cap, veh/h	507	632	15	381	398	516	423	167	149	251	69	88
Arrive On Green	0.35	0.35	0.35	0.05	0.54	0.54	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	976	1833	44	1767	738	955	1177	885	793	643	369	467
Grp Volume(v), veh/h	178	0	468	40	0	413	7	0	55	171	0	0
Grp Sat Flow(s),veh/h/ln	976	0	1877	1767	0	1692	1177	0	1678	1479	0	0
Q Serve(g_s), s	6.2	0.0	9.2	0.5	0.0	6.3	0.0	0.0	1.2	3.1	0.0	0.0
Cycle Q Clear(g_c), s	6.2	0.0	9.2	0.5	0.0	6.3	0.2	0.0	1.2	4.4	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.56	1.00		0.47	0.53		0.32
Lane Grp Cap(c), veh/h	507	0	648	381	0	914	423	0	316	409	0	0
V/C Ratio(X)	0.35	0.00	0.72	0.11	0.00	0.45	0.02	0.00	0.17	0.42	0.00	0.00
Avail Cap(c_a), veh/h	1093	0	1774	913	0	1599	1313	0	1586	1494	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.1	0.0	12.1	8.2	0.0	5.9	14.0	0.0	14.4	15.6	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.6	0.0	0.0	0.1	0.0	0.0	0.3	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	0.0	3.3	0.2	0.0	1.5	0.1	0.0	0.4	1.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.3	0.0	12.7	8.3	0.0	6.1	14.0	0.0	14.7	15.9	0.0	0.0
LnGrp LOS	B	A	B	A	A	A	B	A	B	B	A	A
Approach Vol, veh/h		646			453			62			171	
Approach Delay, s/veh		12.3			6.2			14.7			15.9	
Approach LOS		B			A			B			B	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		28.9		13.5	8.3	20.6		13.5				
Change Period (Y+Rc), s		* 6		5.5	6.0	6.0		5.5				
Max Green Setting (Gmax), s		* 40		40.0	15.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s		8.3		3.2	2.5	11.2		6.4				
Green Ext Time (p_c), s		2.1		0.4	0.0	2.8		0.8				

Intersection Summary	
HCM 6th Ctrl Delay	10.8
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
5: NE 75th Street & LWHS West Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	9	15	25	1	8	12
Future Volume (vph)	9	15	25	1	8	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		742	735		229	
Travel Time (s)		20.2	20.0		6.2	
Confl. Peds. (#/hr)	4			4	4	4
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
5: NE 75th Street & LWHS West Driveway

11/12/2018

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	15	25	1	8	12
Future Vol, veh/h	9	15	25	1	8	12
Conflicting Peds, #/hr	4	0	0	4	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	11	18	30	1	10	14

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	35	0	-	0	79	39
Stage 1	-	-	-	-	35	-
Stage 2	-	-	-	-	44	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1589	-	-	-	929	1038
Stage 1	-	-	-	-	993	-
Stage 2	-	-	-	-	984	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1584	-	-	-	917	1031
Mov Cap-2 Maneuver	-	-	-	-	917	-
Stage 1	-	-	-	-	983	-
Stage 2	-	-	-	-	981	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1584	-	-	-	982
HCM Lane V/C Ratio	0.007	-	-	-	0.025
HCM Control Delay (s)	7.3	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Lanes, Volumes, Timings
7: NE 75th Street & LWHS East Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	5	42	39	21	13	7
Future Volume (vph)	5	42	39	21	13	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		735	513		219	
Travel Time (s)		20.0	14.0		6.0	
Confl. Peds. (#/hr)	38			14	14	38
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
7: NE 75th Street & LWHS East Driveway

11/12/2018

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	42	39	21	13	7
Future Vol, veh/h	5	42	39	21	13	7
Conflicting Peds, #/hr	38	0	0	14	14	38
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	6	50	46	25	15	8

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	109	0	-	0	173	135
Stage 1	-	-	-	-	97	-
Stage 2	-	-	-	-	76	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1494	-	-	-	822	919
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	952	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1447	-	-	-	767	862
Mov Cap-2 Maneuver	-	-	-	-	767	-
Stage 1	-	-	-	-	898	-
Stage 2	-	-	-	-	922	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1447	-	-	-	798
HCM Lane V/C Ratio	0.004	-	-	-	0.03
HCM Control Delay (s)	7.5	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

2020 No Action AM Peak Hour

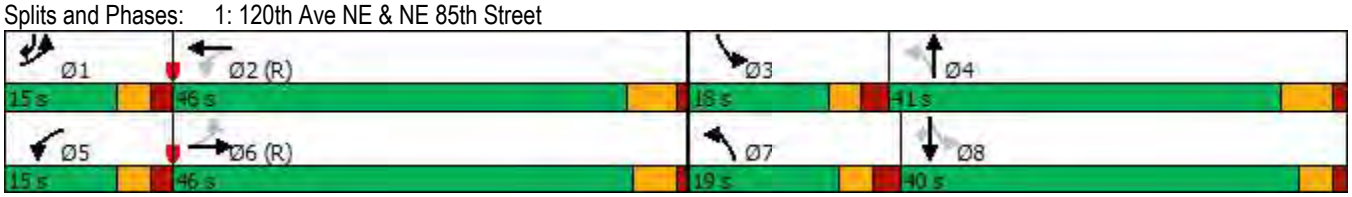
Lanes, Volumes, Timings
1: 120th Ave NE & NE 85th Street

11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	1236	205	48	1278	16	157	39	45	14	36	177
Future Volume (vph)	67	1236	205	48	1278	16	157	39	45	14	36	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	100		0	60		0	100		240
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			35			30			30	
Link Distance (ft)		511			505			1405			524	
Travel Time (s)		11.6			9.8			31.9			11.9	
Confl. Peds. (#/hr)			3			4	2		3	3		2
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	3%	1%	3%	3%	7%	2%	0%	3%	8%	0%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	1	6		5	2		7	4		3	8	1
Permitted Phases	6			2			4			8		8
Detector Phase	1	6		5	2		7	4		3	8	1
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	15.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	11.0	27.0		11.0	33.5		11.5	35.0		11.5	36.5	11.0
Total Split (s)	15.0	46.0		15.0	46.0		19.0	41.0		18.0	40.0	15.0
Total Split (%)	12.5%	38.3%		12.5%	38.3%		15.8%	34.2%		15.0%	33.3%	12.5%
Yellow Time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	3.0	3.0
All-Red Time (s)	2.0	1.0		2.0	1.0		2.5	1.5		2.5	1.5	2.0
Lost Time Adjust (s)	0.0	-1.0		0.0	-1.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0		5.0	4.5		5.5	6.0		5.5	4.5	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?							Yes				Yes	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 7 (6%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: 120th Ave NE & NE 85th Street



HCM 6th Signalized Intersection Summary
1: 120th Ave NE & NE 85th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	1236	205	48	1278	16	157	39	45	14	36	177
Future Volume (veh/h)	67	1236	205	48	1278	16	157	39	45	14	36	177
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1870	1900	1900	1781	1900	1885
Adj Flow Rate, veh/h	71	1315	218	51	1360	17	167	41	48	15	38	188
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	2	0	0	8	0	1
Cap, veh/h	349	1662	273	195	1940	24	370	172	201	268	269	297
Arrive On Green	0.05	0.55	0.54	0.08	1.00	1.00	0.09	0.22	0.22	0.02	0.14	0.14
Sat Flow, veh/h	1767	3030	497	1767	3566	45	1781	796	932	1697	1900	1587
Grp Volume(v), veh/h	71	760	773	51	672	705	167	0	89	15	38	188
Grp Sat Flow(s),veh/h/ln	1767	1763	1764	1767	1763	1847	1781	0	1728	1697	1900	1587
Q Serve(g_s), s	2.1	41.0	42.3	1.5	0.0	0.0	9.3	0.0	5.1	0.9	2.1	13.1
Cycle Q Clear(g_c), s	2.1	41.0	42.3	1.5	0.0	0.0	9.3	0.0	5.1	0.9	2.1	13.1
Prop In Lane	1.00		0.28	1.00		0.02	1.00		0.54	1.00		1.00
Lane Grp Cap(c), veh/h	349	967	968	195	959	1005	370	0	373	268	269	297
V/C Ratio(X)	0.20	0.79	0.80	0.26	0.70	0.70	0.45	0.00	0.24	0.06	0.14	0.63
Avail Cap(c_a), veh/h	416	967	968	270	959	1005	403	0	504	412	562	542
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	0.70	0.00	0.70	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.0	21.5	21.9	18.7	0.0	0.0	37.1	0.0	38.9	42.6	45.1	45.0
Incr Delay (d2), s/veh	0.1	6.4	6.9	0.2	3.7	3.6	0.2	0.0	0.1	0.0	0.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	18.0	18.7	0.6	1.0	1.0	4.1	0.0	2.2	0.4	1.0	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.1	27.9	28.7	19.0	3.7	3.6	37.3	0.0	39.0	42.6	45.2	45.9
LnGrp LOS	B	C	C	B	A	A	D	A	D	D	D	D
Approach Vol, veh/h		1604			1428			256			241	
Approach Delay, s/veh		27.6			4.2			37.9			45.6	
Approach LOS		C			A			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	69.8	7.9	31.9	9.9	70.3	16.8	23.0
Change Period (Y+Rc), s	5.0	5.5	5.5	6.0	5.0	* 5.5	5.5	* 6
Max Green Setting (Gmax), s	10.0	40.5	12.5	35.0	10.0	* 41	13.5	* 36
Max Q Clear Time (g_c+I1), s	4.1	2.0	2.9	7.1	3.5	44.3	11.3	15.1
Green Ext Time (p_c), s	0.0	3.6	0.0	0.1	0.0	0.0	0.1	0.2

Intersection Summary	
HCM 6th Ctrl Delay	20.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
2: LWHS/120th Ave NE & NE 80th Street

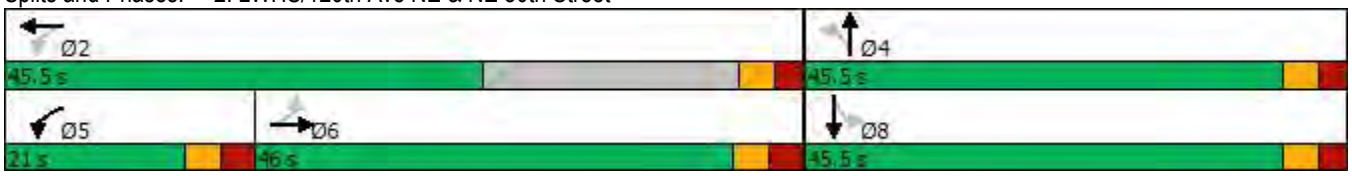
11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	81	70	257	216	41	64	159	195	49	277	39
Future Volume (vph)	46	81	70	257	216	41	64	159	195	49	277	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		660			516			244			1405	
Travel Time (s)		18.0			14.1			6.7			38.3	
Confl. Peds. (#/hr)	8		3	3		8	43		38	38		43
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Heavy Vehicles (%)	2%	5%	0%	1%	3%	3%	0%	0%	1%	9%	0%	3%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	29.0	29.0		12.0	25.5		32.5	32.5		26.5	26.5	
Total Split (s)	46.0	46.0		21.0	45.5		45.5	45.5		45.5	45.5	
Total Split (%)	40.9%	40.9%		18.7%	40.4%		40.4%	40.4%		40.4%	40.4%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	5.5		5.5	5.5			5.5	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 112.5
Actuated Cycle Length: 87.3
Natural Cycle: 90
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: LWHS/120th Ave NE & NE 80th Street



HCM 6th Signalized Intersection Summary
2: LWHS/120th Ave NE & NE 80th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	81	70	257	216	41	64	159	195	49	277	39
Future Volume (veh/h)	46	81	70	257	216	41	64	159	195	49	277	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.99		0.99	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1826	1826	1885	1856	1856	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	71	125	108	395	332	63	98	245	300	75	426	60
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Percent Heavy Veh, %	2	5	5	1	3	3	0	0	0	0	0	0
Cap, veh/h	262	166	143	444	637	121	224	339	415	86	398	52
Arrive On Green	0.19	0.19	0.19	0.17	0.42	0.42	0.45	0.45	0.45	0.45	0.45	0.45
Sat Flow, veh/h	977	894	773	1795	1513	287	924	755	924	88	885	117
Grp Volume(v), veh/h	71	0	233	395	0	395	98	0	545	561	0	0
Grp Sat Flow(s),veh/h/ln	977	0	1667	1795	0	1801	924	0	1679	1089	0	0
Q Serve(g_s), s	5.7	0.0	11.8	15.0	0.0	14.5	0.0	0.0	23.5	16.5	0.0	0.0
Cycle Q Clear(g_c), s	5.7	0.0	11.8	15.0	0.0	14.5	21.7	0.0	23.5	40.0	0.0	0.0
Prop In Lane	1.00		0.46	1.00		0.16	1.00		0.55	0.13		0.11
Lane Grp Cap(c), veh/h	262	0	309	444	0	758	224	0	755	536	0	0
V/C Ratio(X)	0.27	0.00	0.75	0.89	0.00	0.52	0.44	0.00	0.72	1.05	0.00	0.00
Avail Cap(c_a), veh/h	520	0	749	444	0	809	224	0	755	536	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	31.9	0.0	34.3	24.2	0.0	19.1	19.5	0.0	20.0	27.2	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	1.4	18.8	0.0	0.2	1.6	0.0	3.6	51.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	4.9	8.8	0.0	5.9	1.6	0.0	9.6	19.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.1	0.0	35.8	43.1	0.0	19.3	21.1	0.0	23.5	79.1	0.0	0.0
LnGrp LOS	C	A	D	D	A	B	C	A	C	F	A	A
Approach Vol, veh/h		304			790			643			561	
Approach Delay, s/veh		34.9			31.2			23.1			79.1	
Approach LOS		C			C			C			E	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		43.5		45.5	21.0	22.5		45.5				
Change Period (Y+Rc), s		* 6		5.5	6.0	6.0		5.5				
Max Green Setting (Gmax), s		* 40		40.0	15.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s		16.5		25.5	17.0	13.8		42.0				
Green Ext Time (p_c), s		1.7		4.6	0.0	1.2		0.0				

Intersection Summary												
HCM 6th Ctrl Delay			41.1									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
3: NE 80th Street & 122nd Ave NE

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	26	304	448	43	40	76
Future Volume (vph)	26	304	448	43	40	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		516	180		1399	
Travel Time (s)		14.1	4.9		38.2	
Confl. Peds. (#/hr)	21			23	23	21
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	3%	2%	2%	3%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
3: NE 80th Street & 122nd Ave NE

11/12/2018

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	26	304	448	43	40	76
Future Vol, veh/h	26	304	448	43	40	76
Conflicting Peds, #/hr	21	0	0	23	23	21
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	0	3	2	2	3	0
Mvmt Flow	33	385	567	54	51	96

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	644	0	-	0	1091	638
Stage 1	-	-	-	-	617	-
Stage 2	-	-	-	-	474	-
Critical Hdwy	4.1	-	-	-	6.43	6.2
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.3
Pot Cap-1 Maneuver	951	-	-	-	237	480
Stage 1	-	-	-	-	536	-
Stage 2	-	-	-	-	624	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	933	-	-	-	218	463
Mov Cap-2 Maneuver	-	-	-	-	218	-
Stage 1	-	-	-	-	502	-
Stage 2	-	-	-	-	612	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	24
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	933	-	-	-	334
HCM Lane V/C Ratio	0.035	-	-	-	0.44
HCM Control Delay (s)	9	0	-	-	24
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	2.2

Lanes, Volumes, Timings
4: 116th Ave NE & NE 75th Street

11/12/2018

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	92	14	187	103	4	347
Future Volume (vph)	92	14	187	103	4	347
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25		25			25
Link Distance (ft)	742		296			360
Travel Time (s)	20.2		8.1			9.8
Confl. Peds. (#/hr)	2	2		2	2	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
4: 116th Ave NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	92	14	187	103	4	347
Future Vol, veh/h	92	14	187	103	4	347
Conflicting Peds, #/hr	2	2	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	73	73	73	73	73	73
Heavy Vehicles, %	1	0	2	0	0	3
Mvmt Flow	126	19	256	141	5	475

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	816	331	0	0	399	0
Stage 1	329	-	-	-	-	-
Stage 2	487	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	348	715	-	-	1171	-
Stage 1	731	-	-	-	-	-
Stage 2	620	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	345	713	-	-	1169	-
Mov Cap-2 Maneuver	345	-	-	-	-	-
Stage 1	730	-	-	-	-	-
Stage 2	615	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	20.9	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	370	1169	-
HCM Lane V/C Ratio	-	-	0.392	0.005	-
HCM Control Delay (s)	-	-	20.9	8.1	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.8	0	-

Lanes, Volumes, Timings
5: NE 75th Street & LWHS West Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	78	32	49	81	40	54
Future Volume (vph)	78	32	49	81	40	54
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		742	612		229	
Travel Time (s)		20.2	16.7		6.2	
Confl. Peds. (#/hr)	2			2	2	2
Peak Hour Factor	0.42	0.42	0.42	0.42	0.42	0.42
Heavy Vehicles (%)	0%	0%	0%	0%	6%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
5: NE 75th Street & LWHS West Driveway

11/12/2018

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	78	32	49	81	40	54
Future Vol, veh/h	78	32	49	81	40	54
Conflicting Peds, #/hr	2	0	0	2	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	42	42	42	42	42	42
Heavy Vehicles, %	0	0	0	0	6	2
Mvmt Flow	186	76	117	193	95	129

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	312	0	-	0	666	218
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	450	-
Critical Hdwy	4.1	-	-	-	6.46	6.22
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.2	-	-	-	3.554	3.318
Pot Cap-1 Maneuver	1260	-	-	-	418	822
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	634	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1258	-	-	-	352	819
Mov Cap-2 Maneuver	-	-	-	-	352	-
Stage 1	-	-	-	-	684	-
Stage 2	-	-	-	-	633	-

Approach	EB	WB	SB
HCM Control Delay, s	5.9	0	16.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1258	-	-	-	523
HCM Lane V/C Ratio	0.148	-	-	-	0.428
HCM Control Delay (s)	8.4	0	-	-	16.9
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.5	-	-	-	2.1

Lanes, Volumes, Timings
6: 120th Ave NE & NE 75th Street

11/12/2018

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	90	56	98	70	51	27
Future Volume (vph)	90	56	98	70	51	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25			25	25	
Link Distance (ft)	612			123	328	
Travel Time (s)	16.7			3.4	8.9	
Confl. Peds. (#/hr)		63	47		63	47
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
6: 120th Ave NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	5.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	90	56	98	70	51	27
Future Vol, veh/h	90	56	98	70	51	27
Conflicting Peds, #/hr	0	63	47	0	63	47
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	3	0	0	0	0	0
Mvmt Flow	129	80	140	100	73	39

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	272	0	675	279
Stage 1	-	-	-	-	232	-
Stage 2	-	-	-	-	443	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1303	-	422	765
Stage 1	-	-	-	-	811	-
Stage 2	-	-	-	-	651	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1235	-	334	696
Mov Cap-2 Maneuver	-	-	-	-	334	-
Stage 1	-	-	-	-	769	-
Stage 2	-	-	-	-	543	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.8	17.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	407	-	-	1235	-
HCM Lane V/C Ratio	0.274	-	-	0.113	-
HCM Control Delay (s)	17.1	-	-	8.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.1	-	-	0.4	-

Lanes, Volumes, Timings
7: NE 75th Street & LWHS East Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	22	94	158	64	25	9
Future Volume (vph)	22	94	158	64	25	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		123	513		219	
Travel Time (s)		3.4	14.0		6.0	
Confl. Peds. (#/hr)	47			9	9	47
Peak Hour Factor	0.59	0.59	0.59	0.59	0.59	0.59
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
7: NE 75th Street & LWHS East Driveway

11/12/2018

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	94	158	64	25	9
Future Vol, veh/h	22	94	158	64	25	9
Conflicting Peds, #/hr	47	0	0	9	9	47
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	59	59	59	59	59	59
Heavy Vehicles, %	0	2	0	0	0	0
Mvmt Flow	37	159	268	108	42	15

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	423	0	-	0	611	416
Stage 1	-	-	-	-	369	-
Stage 2	-	-	-	-	242	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1147	-	-	-	460	641
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	803	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1102	-	-	-	409	592
Mov Cap-2 Maneuver	-	-	-	-	409	-
Stage 1	-	-	-	-	651	-
Stage 2	-	-	-	-	772	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	14.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1102	-	-	-	445
HCM Lane V/C Ratio	0.034	-	-	-	0.129
HCM Control Delay (s)	8.4	0	-	-	14.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Lanes, Volumes, Timings
8: 122nd Ave NE & NE 75th Street

11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	23	47	3	39	2	58	43	0	3	81	128
Future Volume (vph)	48	23	47	3	39	2	58	43	0	3	81	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		513			178			239			1295	
Travel Time (s)		14.0			4.9			6.5			35.3	
Confl. Peds. (#/hr)	40		15	3		28	15		3	28		40
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Heavy Vehicles (%)	4%	0%	0%	0%	0%	0%	2%	0%	0%	33%	0%	2%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM 6th TWSC
8: 122nd Ave NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	7.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	48	23	47	3	39	2	58	43	0	3	81	128
Future Vol, veh/h	48	23	47	3	39	2	58	43	0	3	81	128
Conflicting Peds, #/hr	40	0	15	3	0	28	15	0	3	28	0	40
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	67	67	67	67	67	67	67	67	67
Heavy Vehicles, %	4	0	0	0	0	0	2	0	0	33	0	2
Mvmt Flow	72	34	70	4	58	3	87	64	0	4	121	191

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	574	531	272	558	626	132	352	0	0	92	0	0
Stage 1	265	265	-	266	266	-	-	-	-	-	-	-
Stage 2	309	266	-	292	360	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.5	6.2	7.1	6.5	6.2	4.12	-	-	4.43	-	-
Critical Hdwy Stg 1	6.14	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4	3.3	3.5	4	3.3	2.218	-	-	2.497	-	-
Pot Cap-1 Maneuver	427	457	772	443	403	923	1207	-	-	1329	-	-
Stage 1	736	693	-	744	692	-	-	-	-	-	-	-
Stage 2	697	692	-	720	630	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	326	397	737	339	350	871	1167	-	-	1298	-	-
Mov Cap-2 Maneuver	326	397	-	339	350	-	-	-	-	-	-	-
Stage 1	657	667	-	670	624	-	-	-	-	-	-	-
Stage 2	562	624	-	608	607	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.6	17.3	4.8	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1167	-	-	439	359	1298	-	-
HCM Lane V/C Ratio	0.074	-	-	0.401	0.183	0.003	-	-
HCM Control Delay (s)	8.3	0	-	18.6	17.3	7.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	1.9	0.7	0	-	-

2020 No Action Afternoon Peak Hour

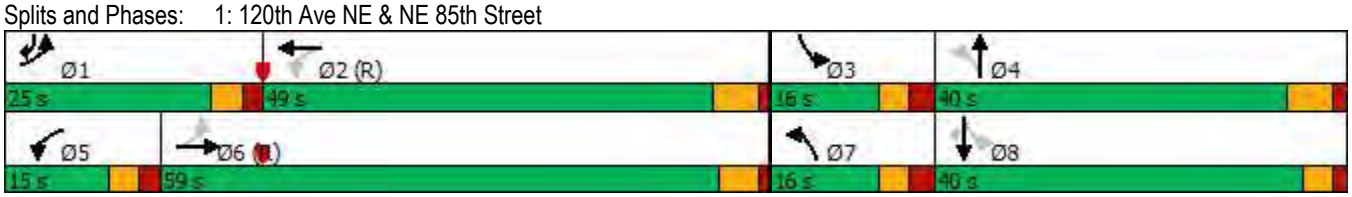
Lanes, Volumes, Timings
1: 120th Ave NE & NE 85th Street

11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	222	1250	115	26	1151	54	248	119	59	87	68	372
Future Volume (vph)	222	1250	115	26	1151	54	248	119	59	87	68	372
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	100		0	60		0	100		240
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			35			30			30	
Link Distance (ft)		511			505			1405			524	
Travel Time (s)		11.6			9.8			31.9			11.9	
Confl. Peds. (#/hr)	1		21	21		1	6		5	5		6
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	3%	4%	0%	2%	2%	2%	2%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	1	6		5	2		7	4		3	8	1
Permitted Phases	6			2			4			8		8
Detector Phase	1	6		5	2		7	4		3	8	1
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	15.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	11.0	27.0		11.0	33.5		11.5	35.0		11.5	36.5	11.0
Total Split (s)	25.0	59.0		15.0	49.0		16.0	40.0		16.0	40.0	25.0
Total Split (%)	19.2%	45.4%		11.5%	37.7%		12.3%	30.8%		12.3%	30.8%	19.2%
Yellow Time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	3.0	3.0
All-Red Time (s)	2.0	1.0		2.0	1.0		2.5	1.5		2.5	1.5	2.0
Lost Time Adjust (s)	0.0	-1.0		0.0	-1.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0		5.0	4.5		5.5	6.0		5.5	4.5	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?							Yes				Yes	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 120 (92%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: 120th Ave NE & NE 85th Street



HCM 6th Signalized Intersection Summary
1: 120th Ave NE & NE 85th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	222	1250	115	26	1151	54	248	119	59	87	68	372
Future Volume (veh/h)	222	1250	115	26	1151	54	248	119	59	87	68	372
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1856	1856	1900	1870	1870	1870	1870	1870	1900	1870	1885
Adj Flow Rate, veh/h	239	1344	124	28	1238	58	267	128	63	94	73	400
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	3	3	0	2	2	2	2	2	0	2	1
Cap, veh/h	265	1584	145	150	1449	68	393	319	157	369	453	537
Arrive On Green	0.10	0.49	0.48	0.03	0.42	0.41	0.08	0.27	0.27	0.05	0.24	0.24
Sat Flow, veh/h	1795	3257	299	1810	3452	162	1781	1180	581	1810	1870	1586
Grp Volume(v), veh/h	239	724	744	28	637	659	267	0	191	94	73	400
Grp Sat Flow(s),veh/h/ln	1795	1763	1794	1810	1777	1836	1781	0	1761	1810	1870	1586
Q Serve(g_s), s	10.3	46.6	47.3	1.1	42.1	42.3	10.5	0.0	11.5	5.0	4.0	29.0
Cycle Q Clear(g_c), s	10.3	46.6	47.3	1.1	42.1	42.3	10.5	0.0	11.5	5.0	4.0	29.0
Prop In Lane	1.00		0.17	1.00		0.09	1.00		0.33	1.00		1.00
Lane Grp Cap(c), veh/h	265	857	872	150	746	771	393	0	476	369	453	537
V/C Ratio(X)	0.90	0.85	0.85	0.19	0.85	0.86	0.68	0.00	0.40	0.25	0.16	0.74
Avail Cap(c_a), veh/h	369	857	872	237	746	771	393	0	476	421	511	586
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	0.77	0.00	0.77	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.9	29.1	29.4	26.8	34.1	34.2	37.0	0.0	38.8	34.4	38.8	38.1
Incr Delay (d2), s/veh	16.2	10.0	10.3	0.2	10.6	10.4	3.0	0.0	0.2	0.1	0.1	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	21.6	22.4	0.5	19.9	20.6	2.6	0.0	5.0	2.2	1.9	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.2	39.2	39.7	27.0	44.7	44.6	40.0	0.0	39.0	34.5	38.9	42.0
LnGrp LOS	D	D	D	C	D	D	D	A	D	C	D	D
Approach Vol, veh/h		1707			1324			458			567	
Approach Delay, s/veh		40.5			44.3			39.6			40.4	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.5	59.1	12.3	41.2	8.8	67.7	16.0	37.5
Change Period (Y+Rc), s	5.0	5.5	5.5	6.0	5.0	* 5.5	5.5	* 6
Max Green Setting (Gmax), s	20.0	43.5	10.5	34.0	10.0	* 54	10.5	* 36
Max Q Clear Time (g_c+I1), s	12.3	44.3	7.0	13.5	3.1	49.3	12.5	31.0
Green Ext Time (p_c), s	0.1	0.0	0.0	0.3	0.0	2.1	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	41.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
2: LWHS/120th Ave NE & NE 80th Street

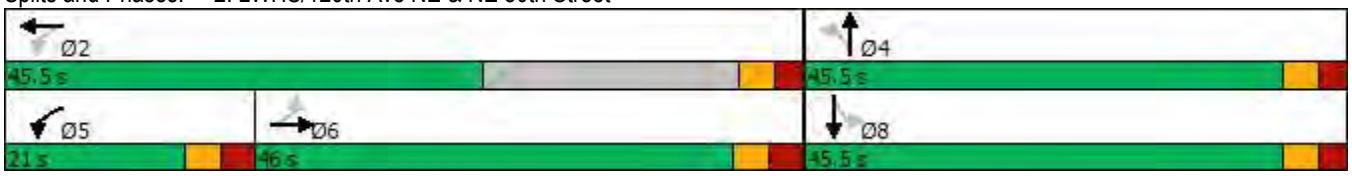
11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	210	36	78	153	100	33	177	148	59	74	64
Future Volume (vph)	119	210	36	78	153	100	33	177	148	59	74	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		660			516			244			1405	
Travel Time (s)		18.0			14.1			6.7			38.3	
Confl. Peds. (#/hr)	34		41	41		34	95		144	144		95
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	2%	2%	0%	4%	4%	1%	0%	2%	0%	2%	2%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	29.0	29.0		12.0	25.5		32.5	32.5		26.5	26.5	
Total Split (s)	46.0	46.0		21.0	45.5		45.5	45.5		45.5	45.5	
Total Split (%)	40.9%	40.9%		18.7%	40.4%		40.4%	40.4%		40.4%	40.4%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	5.5		5.5	5.5			5.5	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 112.5
Actuated Cycle Length: 66.9
Natural Cycle: 75
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: LWHS/120th Ave NE & NE 80th Street



HCM 6th Signalized Intersection Summary
2: LWHS/120th Ave NE & NE 80th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	210	36	78	153	100	33	177	148	59	74	64
Future Volume (veh/h)	119	210	36	78	153	100	33	177	148	59	74	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.95		0.92	0.97		0.95	0.95		0.82	0.92		0.82
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1900	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	137	241	41	90	176	115	38	203	170	68	85	74
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	4	4	4	0	2	2	2	2	2
Cap, veh/h	389	419	71	378	442	289	443	334	279	148	174	122
Arrive On Green	0.27	0.27	0.27	0.07	0.43	0.43	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	1034	1537	261	1753	1017	665	1190	847	709	199	442	310
Grp Volume(v), veh/h	137	0	282	90	0	291	38	0	373	227	0	0
Grp Sat Flow(s),veh/h/ln	1034	0	1798	1753	0	1682	1190	0	1556	951	0	0
Q Serve(g_s), s	7.5	0.0	9.1	2.3	0.0	7.9	0.0	0.0	12.8	4.3	0.0	0.0
Cycle Q Clear(g_c), s	7.5	0.0	9.1	2.3	0.0	7.9	2.5	0.0	12.8	17.1	0.0	0.0
Prop In Lane	1.00		0.15	1.00		0.40	1.00		0.46	0.30		0.33
Lane Grp Cap(c), veh/h	389	0	490	378	0	731	443	0	613	444	0	0
V/C Ratio(X)	0.35	0.00	0.58	0.24	0.00	0.40	0.09	0.00	0.61	0.51	0.00	0.00
Avail Cap(c_a), veh/h	723	0	1072	642	0	1003	683	0	927	705	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	20.5	0.0	21.1	14.8	0.0	13.0	13.1	0.0	16.2	16.7	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.4	0.1	0.0	0.1	0.1	0.0	1.2	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	3.7	0.9	0.0	2.8	0.4	0.0	4.4	3.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.7	0.0	21.5	14.9	0.0	13.1	13.2	0.0	17.4	17.1	0.0	0.0
LnGrp LOS	C	A	C	B	A	B	B	A	B	B	A	A
Approach Vol, veh/h		419			381			411			227	
Approach Delay, s/veh		21.2			13.5			17.0			17.1	
Approach LOS		C			B			B			B	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		35.2		31.9	10.9	24.3		31.9				
Change Period (Y+Rc), s		* 6		5.5	6.0	6.0		5.5				
Max Green Setting (Gmax), s		* 40		40.0	15.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s		9.9		14.8	4.3	11.1		19.1				
Green Ext Time (p_c), s		1.3		3.6	0.1	1.6		1.1				

Intersection Summary												
HCM 6th Ctrl Delay			17.3									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
3: NE 80th Street & 122nd Ave NE

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	42	380	295	46	48	40
Future Volume (vph)	42	380	295	46	48	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		516	180		1399	
Travel Time (s)		14.1	4.9		38.2	
Confl. Peds. (#/hr)	57			56	56	57
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	3%	2%	2%	3%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
3: NE 80th Street & 122nd Ave NE

11/12/2018

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	42	380	295	46	48	40
Future Vol, veh/h	42	380	295	46	48	40
Conflicting Peds, #/hr	57	0	0	56	56	57
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	1	3	2	2	3
Mvmt Flow	45	409	317	49	52	43

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	423	0	-	0	954	456
Stage 1	-	-	-	-	399	-
Stage 2	-	-	-	-	555	-
Critical Hdwy	4.1	-	-	-	6.42	6.23
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.327
Pot Cap-1 Maneuver	1147	-	-	-	287	602
Stage 1	-	-	-	-	678	-
Stage 2	-	-	-	-	575	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1093	-	-	-	247	546
Mov Cap-2 Maneuver	-	-	-	-	247	-
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	548	-

Approach	EB	WB	SB
HCM Control Delay, s	0.8	0	20.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1093	-	-	-	329
HCM Lane V/C Ratio	0.041	-	-	-	0.288
HCM Control Delay (s)	8.4	0	-	-	20.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.2

Lanes, Volumes, Timings
4: 116th Ave NE & NE 75th Street

11/12/2018

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	131	12	364	53	3	251
Future Volume (vph)	131	12	364	53	3	251
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25		25			25
Link Distance (ft)	742		296			360
Travel Time (s)	20.2		8.1			9.8
Confl. Peds. (#/hr)	8	13		8	13	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	0%	2%	2%	0%	2%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
4: 116th Ave NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	3.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	131	12	364	53	3	251
Future Vol, veh/h	131	12	364	53	3	251
Conflicting Peds, #/hr	8	13	0	8	13	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	0	2	2	0	2
Mvmt Flow	149	14	414	60	3	285

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	756	470	0	0	487	0
Stage 1	457	-	-	-	-	-
Stage 2	299	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	377	598	-	-	1086	-
Stage 1	640	-	-	-	-	-
Stage 2	755	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	369	585	-	-	1074	-
Mov Cap-2 Maneuver	369	-	-	-	-	-
Stage 1	633	-	-	-	-	-
Stage 2	747	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.3	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	381	1074	-
HCM Lane V/C Ratio	-	-	0.427	0.003	-
HCM Control Delay (s)	-	-	21.3	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	2.1	0	-

Lanes, Volumes, Timings
5: NE 75th Street & LWHS West Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	19	39	48	8	94	96
Future Volume (vph)	19	39	48	8	94	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		742	612		229	
Travel Time (s)		20.2	16.7		6.2	
Confl. Peds. (#/hr)	11			8	8	11
Peak Hour Factor	0.58	0.58	0.58	0.58	0.58	0.58
Heavy Vehicles (%)	0%	3%	0%	0%	3%	1%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
5: NE 75th Street & LWHS West Driveway

11/12/2018

Intersection	
Int Delay, s/veh	8.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	19	39	48	8	94	96
Future Vol, veh/h	19	39	48	8	94	96
Conflicting Peds, #/hr	11	0	0	8	8	11
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	58	58	58	58	58	58
Heavy Vehicles, %	0	3	0	0	3	1
Mvmt Flow	33	67	83	14	162	166

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	108	0	-	0	242	112
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	141	-
Critical Hdwy	4.1	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	1495	-	-	-	744	944
Stage 1	-	-	-	-	921	-
Stage 2	-	-	-	-	883	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1481	-	-	-	713	927
Mov Cap-2 Maneuver	-	-	-	-	713	-
Stage 1	-	-	-	-	892	-
Stage 2	-	-	-	-	875	-

Approach	EB	WB	SB
HCM Control Delay, s	2.5	0	12.5
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1481	-	-	-	807
HCM Lane V/C Ratio	0.022	-	-	-	0.406
HCM Control Delay (s)	7.5	0	-	-	12.5
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	2

Lanes, Volumes, Timings
6: 120th Avenue NE & NE 75th Street

11/12/2018

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	135	57	64	27	17	52
Future Volume (vph)	135	57	64	27	17	52
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25			25	25	
Link Distance (ft)	612			123	299	
Travel Time (s)	16.7			3.4	8.2	
Confl. Peds. (#/hr)		101	128		101	128
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
6: 120th Avenue NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	4.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	135	57	64	27	17	52
Future Vol, veh/h	135	57	64	27	17	52
Conflicting Peds, #/hr	0	101	128	0	101	128
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	67	67	67	67	67	67
Heavy Vehicles, %	3	0	0	0	0	0
Mvmt Flow	201	85	96	40	25	78

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	414	0	705	500
Stage 1	-	-	-	-	372	-
Stage 2	-	-	-	-	333	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1156	-	406	575
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	731	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1033	-	300	459
Mov Cap-2 Maneuver	-	-	-	-	300	-
Stage 1	-	-	-	-	627	-
Stage 2	-	-	-	-	606	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.2	16.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	406	-	-	1033	-
HCM Lane V/C Ratio	0.254	-	-	0.092	-
HCM Control Delay (s)	16.9	-	-	8.8	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1	-	-	0.3	-

Lanes, Volumes, Timings
7: NE 75th Street & LWHS East Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	23	164	81	23	31	13
Future Volume (vph)	23	164	81	23	31	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		123	513		219	
Travel Time (s)		3.4	14.0		6.0	
Confl. Peds. (#/hr)	115			5	5	115
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
7: NE 75th Street & LWHS East Driveway

11/12/2018

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	23	164	81	23	31	13
Future Vol, veh/h	23	164	81	23	31	13
Conflicting Peds, #/hr	115	0	0	5	5	115
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	3	0	0	0	0
Mvmt Flow	34	241	119	34	46	19

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	268	0	-	0	565	366
Stage 1	-	-	-	-	251	-
Stage 2	-	-	-	-	314	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1307	-	-	-	490	684
Stage 1	-	-	-	-	795	-
Stage 2	-	-	-	-	745	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1182	-	-	-	387	559
Mov Cap-2 Maneuver	-	-	-	-	387	-
Stage 1	-	-	-	-	695	-
Stage 2	-	-	-	-	673	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	15
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1182	-	-	-	426
HCM Lane V/C Ratio	0.029	-	-	-	0.152
HCM Control Delay (s)	8.1	0	-	-	15
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Lanes, Volumes, Timings
8: 122nd Ave NE & NE 75th Street

11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	36	40	2	18	2	37	68	3	8	57	69
Future Volume (vph)	109	36	40	2	18	2	37	68	3	8	57	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		513			178			239			1295	
Travel Time (s)		14.0			4.9			6.5			35.3	
Confl. Peds. (#/hr)	59		16	6		49	16		6	49		59
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	1%	3%	0%	0%	6%	0%	0%	2%	0%	0%	2%	5%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
8: 122nd Ave NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	36	40	2	18	2	37	68	3	8	57	69
Future Vol, veh/h	109	36	40	2	18	2	37	68	3	8	57	69
Conflicting Peds, #/hr	59	0	16	6	0	49	16	0	6	49	0	59
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	1	3	0	0	6	0	0	2	0	0	2	5
Mvmt Flow	133	44	49	2	22	2	45	83	4	10	70	84

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	437	417	187	419	457	193	213	0	0	136	0	0
Stage 1	191	191	-	224	224	-	-	-	-	-	-	-
Stage 2	246	226	-	195	233	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.53	6.2	7.1	6.56	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.11	5.53	-	6.1	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.53	-	6.1	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.027	3.3	3.5	4.054	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	532	525	860	548	494	854	1369	-	-	1461	-	-
Stage 1	813	740	-	783	711	-	-	-	-	-	-	-
Stage 2	760	715	-	811	704	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	446	458	807	437	431	779	1302	-	-	1401	-	-
Mov Cap-2 Maneuver	446	458	-	437	431	-	-	-	-	-	-	-
Stage 1	746	698	-	724	657	-	-	-	-	-	-	-
Stage 2	671	661	-	699	664	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.1	13.5	2.7	0.5
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1302	-	-	497	450	1401	-	-
HCM Lane V/C Ratio	0.035	-	-	0.454	0.06	0.007	-	-
HCM Control Delay (s)	7.9	0	-	18.1	13.5	7.6	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.3	0.2	0	-	-

2020 No Action PM Peak Hour

Lanes, Volumes, Timings
1: 120th Ave NE & NE 85th Street

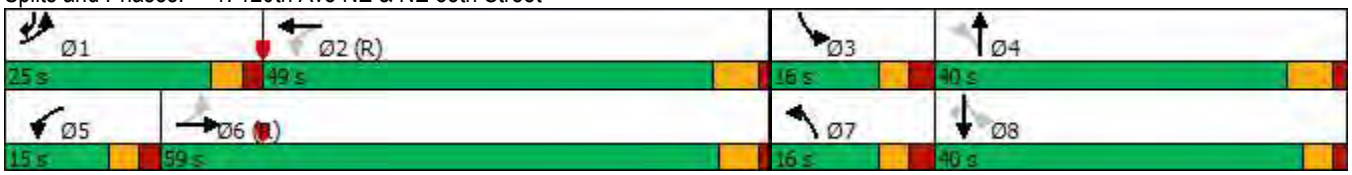
11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	248	1647	108	13	1297	54	283	120	45	63	67	321
Future Volume (vph)	248	1647	108	13	1297	54	283	120	45	63	67	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	100		0	60		0	100		240
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			35			30			30	
Link Distance (ft)		511			505			1405			524	
Travel Time (s)		11.6			9.8			31.9			11.9	
Confl. Peds. (#/hr)	9		5	5		9	9		9	9		9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	2%	8%	1%	0%	1%	0%	2%	0%	0%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	1	6		5	2		7	4		3	8	1
Permitted Phases	6			2			4			8		8
Detector Phase	1	6		5	2		7	4		3	8	1
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	15.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	11.0	27.0		11.0	33.5		11.5	35.0		11.5	36.5	11.0
Total Split (s)	25.0	59.0		15.0	49.0		16.0	40.0		16.0	40.0	25.0
Total Split (%)	19.2%	45.4%		11.5%	37.7%		12.3%	30.8%		12.3%	30.8%	19.2%
Yellow Time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	3.0	3.0
All-Red Time (s)	2.0	1.0		2.0	1.0		2.5	1.5		2.5	1.5	2.0
Lost Time Adjust (s)	0.0	-1.0		0.0	-1.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0		5.0	4.5		5.5	6.0		5.5	4.5	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?							Yes				Yes	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None

Intersection Summary

Area Type: Other
Cycle Length: 130
Actuated Cycle Length: 130
Offset: 120 (92%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 135
Control Type: Actuated-Coordinated

Splits and Phases: 1: 120th Ave NE & NE 85th Street



HCM 6th Signalized Intersection Summary
1: 120th Ave NE & NE 85th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	248	1647	108	13	1297	54	283	120	45	63	67	321
Future Volume (veh/h)	248	1647	108	13	1297	54	283	120	45	63	67	321
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1885	1885	1781	1885	1885	1885	1900	1900	1900	1900	1885
Adj Flow Rate, veh/h	261	1734	114	14	1365	57	298	126	47	66	71	338
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	1	8	1	1	1	0	0	0	0	1
Cap, veh/h	286	1793	117	91	1497	62	380	332	124	343	406	523
Arrive On Green	0.12	0.53	0.52	0.02	0.43	0.42	0.08	0.25	0.25	0.04	0.21	0.21
Sat Flow, veh/h	1810	3412	222	1697	3502	146	1795	1315	491	1810	1900	1577
Grp Volume(v), veh/h	261	902	946	14	697	725	298	0	173	66	71	338
Grp Sat Flow(s),veh/h/ln	1810	1791	1843	1697	1791	1857	1795	0	1805	1810	1900	1577
Q Serve(g_s), s	13.0	62.6	65.0	0.6	47.4	47.7	10.5	0.0	10.3	3.7	4.0	23.7
Cycle Q Clear(g_c), s	13.0	62.6	65.0	0.6	47.4	47.7	10.5	0.0	10.3	3.7	4.0	23.7
Prop In Lane	1.00		0.12	1.00		0.08	1.00		0.27	1.00		1.00
Lane Grp Cap(c), veh/h	286	941	969	91	766	794	380	0	456	343	406	523
V/C Ratio(X)	0.91	0.96	0.98	0.15	0.91	0.91	0.78	0.00	0.38	0.19	0.17	0.65
Avail Cap(c_a), veh/h	354	941	969	190	766	794	380	0	472	413	519	617
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	0.91	0.00	0.91	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.4	29.5	30.1	31.8	34.9	35.0	41.2	0.0	40.1	37.5	41.7	37.1
Incr Delay (d2), s/veh	21.7	20.9	23.7	0.3	15.1	15.0	8.7	0.0	0.2	0.1	0.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.1	31.4	34.1	0.2	23.3	24.2	4.8	0.0	4.6	1.7	1.9	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.1	50.4	53.9	32.1	50.0	50.0	49.9	0.0	40.3	37.6	41.8	38.2
LnGrp LOS	E	D	D	C	D	D	D	A	D	D	D	D
Approach Vol, veh/h		2109			1436			471			475	
Approach Delay, s/veh		53.0			49.8			46.4			38.6	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.1	60.1	10.9	38.8	7.4	72.8	16.0	33.8
Change Period (Y+Rc), s	5.0	5.5	5.5	6.0	5.0	* 5.5	5.5	* 6
Max Green Setting (Gmax), s	20.0	43.5	10.5	34.0	10.0	* 54	10.5	* 36
Max Q Clear Time (g_c+I1), s	15.0	49.7	5.7	12.3	2.6	67.0	12.5	25.7
Green Ext Time (p_c), s	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	49.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
2: LWHS/120th Ave NE & NE 80th Street

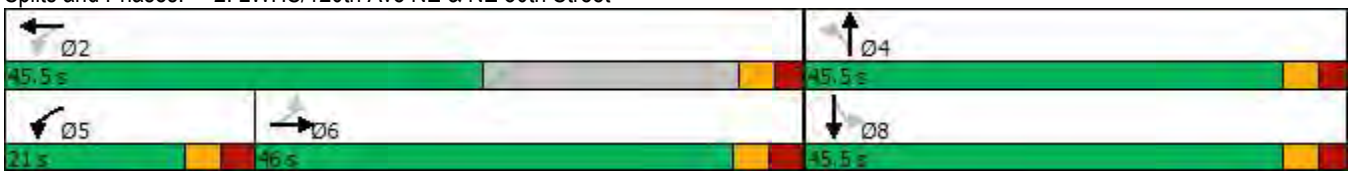
11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	452	11	42	178	230	8	33	30	89	29	53
Future Volume (vph)	176	452	11	42	178	230	8	33	30	89	29	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		660			516			244			1405	
Travel Time (s)		18.0			14.1			6.7			38.3	
Confl. Peds. (#/hr)	1		6	6		1	3		8	8		3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	0%	3%	2%	1%	14%	4%	4%	1%	4%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	29.0	29.0		12.0	25.5		32.5	32.5		26.5	26.5	
Total Split (s)	46.0	46.0		21.0	45.5		45.5	45.5		45.5	45.5	
Total Split (%)	40.9%	40.9%		18.7%	40.4%		40.4%	40.4%		40.4%	40.4%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	5.5		5.5	5.5			5.5	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 112.5
Actuated Cycle Length: 53.3
Natural Cycle: 75
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: LWHS/120th Ave NE & NE 80th Street



HCM 6th Signalized Intersection Summary
2: LWHS/120th Ave NE & NE 80th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	452	11	42	178	230	8	33	30	89	29	53
Future Volume (veh/h)	176	452	11	42	178	230	8	33	30	89	29	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.98	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1856	1870	1870	1693	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	185	476	12	44	187	242	8	35	32	94	31	56
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	3	2	2	14	4	4	4	4	4
Cap, veh/h	501	644	16	374	401	519	415	172	157	245	77	89
Arrive On Green	0.35	0.35	0.35	0.06	0.54	0.54	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	962	1830	46	1767	738	955	1170	876	801	617	394	453
Grp Volume(v), veh/h	185	0	488	44	0	429	8	0	67	181	0	0
Grp Sat Flow(s),veh/h/ln	962	0	1876	1767	0	1692	1170	0	1677	1465	0	0
Q Serve(g_s), s	6.8	0.0	10.1	0.6	0.0	6.9	0.0	0.0	1.5	3.4	0.0	0.0
Cycle Q Clear(g_c), s	6.8	0.0	10.1	0.6	0.0	6.9	0.2	0.0	1.5	4.9	0.0	0.0
Prop In Lane	1.00		0.02	1.00		0.56	1.00		0.48	0.52		0.31
Lane Grp Cap(c), veh/h	501	0	661	374	0	921	415	0	329	411	0	0
V/C Ratio(X)	0.37	0.00	0.74	0.12	0.00	0.47	0.02	0.00	0.20	0.44	0.00	0.00
Avail Cap(c_a), veh/h	1031	0	1694	873	0	1528	1242	0	1514	1424	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.5	0.0	12.6	8.5	0.0	6.2	14.4	0.0	14.9	16.2	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.6	0.1	0.0	0.1	0.0	0.0	0.4	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	3.6	0.2	0.0	1.7	0.1	0.0	0.5	1.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.7	0.0	13.2	8.6	0.0	6.3	14.4	0.0	15.3	16.5	0.0	0.0
LnGrp LOS	B	A	B	A	A	A	B	A	B	B	A	A
Approach Vol, veh/h		673			473			75			181	
Approach Delay, s/veh		12.8			6.5			15.2			16.5	
Approach LOS		B			A			B			B	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		30.1		14.2	8.5	21.6		14.2				
Change Period (Y+Rc), s		* 6		5.5	6.0	6.0		5.5				
Max Green Setting (Gmax), s		* 40		40.0	15.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s		8.9		3.5	2.6	12.1		6.9				
Green Ext Time (p_c), s		2.1		0.5	0.0	2.9		0.8				

Intersection Summary	
HCM 6th Ctrl Delay	11.3
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
5: NE 75th Street & LWHS West Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	10	17	27	2	9	13
Future Volume (vph)	10	17	27	2	9	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		742	735		229	
Travel Time (s)		20.2	20.0		6.2	
Confl. Peds. (#/hr)	4			4	4	4
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
5: NE 75th Street & LWHS West Driveway

11/12/2018

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	10	17	27	2	9	13
Future Vol, veh/h	10	17	27	2	9	13
Conflicting Peds, #/hr	4	0	0	4	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	12	20	33	2	11	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	39	0	-	0	86	42
Stage 1	-	-	-	-	38	-
Stage 2	-	-	-	-	48	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1584	-	-	-	920	1034
Stage 1	-	-	-	-	990	-
Stage 2	-	-	-	-	980	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1579	-	-	-	907	1027
Mov Cap-2 Maneuver	-	-	-	-	907	-
Stage 1	-	-	-	-	979	-
Stage 2	-	-	-	-	977	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1579	-	-	-	974
HCM Lane V/C Ratio	0.008	-	-	-	0.027
HCM Control Delay (s)	7.3	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Lanes, Volumes, Timings
7: NE 75th Street & LWHS East Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	6	45	42	22	14	8
Future Volume (vph)	6	45	42	22	14	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		735	513		219	
Travel Time (s)		20.0	14.0		6.0	
Confl. Peds. (#/hr)	38			14	14	38
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
7: NE 75th Street & LWHS East Driveway

11/12/2018

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	45	42	22	14	8
Future Vol, veh/h	6	45	42	22	14	8
Conflicting Peds, #/hr	38	0	0	14	14	38
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	7	54	50	26	17	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	114	0	-	0	183	139
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	82	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1488	-	-	-	811	915
Stage 1	-	-	-	-	928	-
Stage 2	-	-	-	-	946	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1441	-	-	-	756	858
Mov Cap-2 Maneuver	-	-	-	-	756	-
Stage 1	-	-	-	-	894	-
Stage 2	-	-	-	-	916	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	9.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1441	-	-	-	790
HCM Lane V/C Ratio	0.005	-	-	-	0.033
HCM Control Delay (s)	7.5	0	-	-	9.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

2020 With Project AM Peak Hour

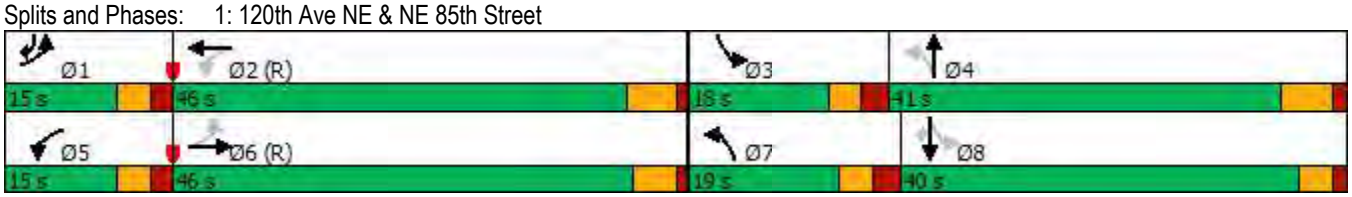
Lanes, Volumes, Timings
1: 120th Ave NE & NE 85th Street

11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	1236	239	62	1278	16	179	39	54	14	36	177
Future Volume (vph)	67	1236	239	62	1278	16	179	39	54	14	36	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	100		0	60		0	100		240
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			35			30			30	
Link Distance (ft)		511			505			1405			524	
Travel Time (s)		11.6			9.8			31.9			11.9	
Confl. Peds. (#/hr)			3			4	2		3	3		2
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Heavy Vehicles (%)	3%	3%	1%	3%	3%	7%	2%	0%	3%	8%	0%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	1	6		5	2		7	4		3	8	1
Permitted Phases	6			2			4			8		8
Detector Phase	1	6		5	2		7	4		3	8	1
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	15.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	11.0	27.0		11.0	33.5		11.5	35.0		11.5	36.5	11.0
Total Split (s)	15.0	46.0		15.0	46.0		19.0	41.0		18.0	40.0	15.0
Total Split (%)	12.5%	38.3%		12.5%	38.3%		15.8%	34.2%		15.0%	33.3%	12.5%
Yellow Time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	3.0	3.0
All-Red Time (s)	2.0	1.0		2.0	1.0		2.5	1.5		2.5	1.5	2.0
Lost Time Adjust (s)	0.0	-1.0		0.0	-1.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0		5.0	4.5		5.5	6.0		5.5	4.5	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?							Yes				Yes	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 7 (6%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: 120th Ave NE & NE 85th Street



HCM 6th Signalized Intersection Summary
1: 120th Ave NE & NE 85th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	67	1236	239	62	1278	16	179	39	54	14	36	177
Future Volume (veh/h)	67	1236	239	62	1278	16	179	39	54	14	36	177
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1870	1900	1900	1781	1900	1885
Adj Flow Rate, veh/h	71	1315	254	66	1360	17	190	41	57	15	38	188
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	2	0	0	8	0	1
Cap, veh/h	345	1578	301	185	1902	24	389	163	226	267	269	297
Arrive On Green	0.05	0.53	0.53	0.09	1.00	1.00	0.10	0.23	0.23	0.02	0.14	0.14
Sat Flow, veh/h	1767	2952	563	1767	3566	45	1781	718	998	1697	1900	1587
Grp Volume(v), veh/h	71	779	790	66	672	705	190	0	98	15	38	188
Grp Sat Flow(s),veh/h/ln	1767	1763	1752	1767	1763	1847	1781	0	1716	1697	1900	1587
Q Serve(g_s), s	2.2	44.2	46.0	2.0	0.0	0.0	10.6	0.0	5.6	0.9	2.1	13.1
Cycle Q Clear(g_c), s	2.2	44.2	46.0	2.0	0.0	0.0	10.6	0.0	5.6	0.9	2.1	13.1
Prop In Lane	1.00		0.32	1.00		0.02	1.00		0.58	1.00		1.00
Lane Grp Cap(c), veh/h	345	942	936	185	941	986	389	0	388	267	269	297
V/C Ratio(X)	0.21	0.83	0.84	0.36	0.71	0.72	0.49	0.00	0.25	0.06	0.14	0.63
Avail Cap(c_a), veh/h	412	942	936	254	941	986	403	0	500	410	562	542
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	0.56	0.00	0.56	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	23.3	23.8	21.4	0.0	0.0	36.6	0.0	38.1	42.6	45.1	45.0
Incr Delay (d2), s/veh	0.1	8.2	9.2	0.4	4.0	3.9	0.2	0.0	0.1	0.0	0.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	19.8	20.7	0.8	1.1	1.1	4.6	0.0	2.4	0.4	1.0	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.6	31.5	33.0	21.7	4.0	3.9	36.8	0.0	38.1	42.6	45.2	45.9
LnGrp LOS	B	C	C	C	A	A	D	A	D	D	D	D
Approach Vol, veh/h		1640			1443			288			241	
Approach Delay, s/veh		31.4			4.8			37.2			45.6	
Approach LOS		C			A			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	68.5	7.9	33.2	10.3	68.6	18.1	23.0
Change Period (Y+Rc), s	5.0	5.5	5.5	6.0	5.0	* 5.5	5.5	* 6
Max Green Setting (Gmax), s	10.0	40.5	12.5	35.0	10.0	* 41	13.5	* 36
Max Q Clear Time (g_c+I1), s	4.2	2.0	2.9	7.6	4.0	48.0	12.6	15.1
Green Ext Time (p_c), s	0.0	3.6	0.0	0.1	0.0	0.0	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	22.2
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

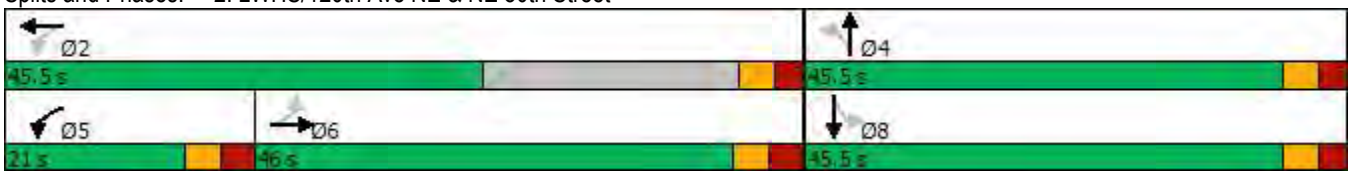
Lanes, Volumes, Timings
2: LWHS/120th Ave NE & NE 80th Street

11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	81	84	292	216	41	73	190	217	49	325	39
Future Volume (vph)	46	81	84	292	216	41	73	190	217	49	325	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		660			516			244			1405	
Travel Time (s)		18.0			14.1			6.7			38.3	
Confl. Peds. (#/hr)	8		3	3		8	43		38	38		43
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Heavy Vehicles (%)	2%	5%	0%	1%	3%	3%	0%	0%	1%	9%	0%	3%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	29.0	29.0		12.0	25.5		32.5	32.5		26.5	26.5	
Total Split (s)	46.0	46.0		21.0	45.5		45.5	45.5		45.5	45.5	
Total Split (%)	40.9%	40.9%		18.7%	40.4%		40.4%	40.4%		40.4%	40.4%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	5.5		5.5	5.5			5.5	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		None	None		None	None	

Intersection Summary	
Area Type:	Other
Cycle Length: 112.5	
Actuated Cycle Length: 87.9	
Natural Cycle: 130	
Control Type: Actuated-Uncoordinated	

Splits and Phases: 2: LWHS/120th Ave NE & NE 80th Street



HCM 6th Signalized Intersection Summary
2: LWHS/120th Ave NE & NE 80th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	46	81	84	292	216	41	73	190	217	49	325	39
Future Volume (veh/h)	46	81	84	292	216	41	73	190	217	49	325	39
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.99		0.99	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1826	1826	1885	1856	1856	1900	1900	1900	1900	1900	1900
Adj Flow Rate, veh/h	71	125	129	449	332	63	112	292	334	75	500	60
Peak Hour Factor	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
Percent Heavy Veh, %	2	5	5	1	3	3	0	0	0	0	0	0
Cap, veh/h	272	160	165	435	649	123	212	348	399	66	315	35
Arrive On Green	0.20	0.20	0.20	0.17	0.43	0.43	0.44	0.44	0.44	0.44	0.44	0.44
Sat Flow, veh/h	978	814	840	1795	1513	287	863	786	899	49	711	79
Grp Volume(v), veh/h	71	0	254	449	0	395	112	0	626	635	0	0
Grp Sat Flow(s),veh/h/ln	978	0	1654	1795	0	1801	863	0	1684	839	0	0
Q Serve(g_s), s	5.7	0.0	13.2	15.0	0.0	14.5	0.0	0.0	29.7	10.3	0.0	0.0
Cycle Q Clear(g_c), s	5.7	0.0	13.2	15.0	0.0	14.5	30.2	0.0	29.7	40.0	0.0	0.0
Prop In Lane	1.00		0.51	1.00		0.16	1.00		0.53	0.12		0.09
Lane Grp Cap(c), veh/h	272	0	325	435	0	773	212	0	747	417	0	0
V/C Ratio(X)	0.26	0.00	0.78	1.03	0.00	0.51	0.53	0.00	0.84	1.52	0.00	0.00
Avail Cap(c_a), veh/h	513	0	734	435	0	799	212	0	747	417	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	31.4	0.0	34.4	26.1	0.0	18.8	22.4	0.0	22.2	26.8	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	1.6	51.6	0.0	0.2	2.8	0.0	8.5	247.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	5.4	13.6	0.0	5.9	2.2	0.0	13.0	38.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.6	0.0	36.0	77.7	0.0	19.0	25.2	0.0	30.7	274.8	0.0	0.0
LnGrp LOS	C	A	D	F	A	B	C	A	C	F	A	A
Approach Vol, veh/h		325			844			738			635	
Approach Delay, s/veh		35.0			50.3			29.9			274.8	
Approach LOS		D			D			C			F	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		44.7		45.5	21.0	23.7		45.5				
Change Period (Y+Rc), s		* 6		5.5	6.0	6.0		5.5				
Max Green Setting (Gmax), s		* 40		40.0	15.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s		16.5		32.2	17.0	15.2		42.0				
Green Ext Time (p_c), s		1.7		3.6	0.0	1.3		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	98.5
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
3: NE 80th Street & 122nd Ave NE

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	35	317	469	43	40	90
Future Volume (vph)	35	317	469	43	40	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		516	180		1399	
Travel Time (s)		14.1	4.9		38.2	
Confl. Peds. (#/hr)	21			23	23	21
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Heavy Vehicles (%)	0%	3%	2%	2%	3%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
3: NE 80th Street & 122nd Ave NE

11/12/2018

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	35	317	469	43	40	90
Future Vol, veh/h	35	317	469	43	40	90
Conflicting Peds, #/hr	21	0	0	23	23	21
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	0	3	2	2	3	0
Mvmt Flow	44	401	594	54	51	114

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	671	0	-	0	1156	665
Stage 1	-	-	-	-	644	-
Stage 2	-	-	-	-	512	-
Critical Hdwy	4.1	-	-	-	6.43	6.2
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.3
Pot Cap-1 Maneuver	929	-	-	-	216	464
Stage 1	-	-	-	-	521	-
Stage 2	-	-	-	-	600	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	911	-	-	-	195	447
Mov Cap-2 Maneuver	-	-	-	-	195	-
Stage 1	-	-	-	-	479	-
Stage 2	-	-	-	-	589	-

Approach	EB	WB	SB
HCM Control Delay, s	0.9	0	27.6
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	911	-	-	-	320
HCM Lane V/C Ratio	0.049	-	-	-	0.514
HCM Control Delay (s)	9.2	0	-	-	27.6
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.2	-	-	-	2.8

Lanes, Volumes, Timings
4: 116th Ave NE & NE 75th Street

11/12/2018

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	105	14	201	123	4	356
Future Volume (vph)	105	14	201	123	4	356
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25		25			25
Link Distance (ft)	742		296			360
Travel Time (s)	20.2		8.1			9.8
Confl. Peds. (#/hr)	2	2		2	2	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Heavy Vehicles (%)	1%	0%	2%	0%	0%	3%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
4: 116th Ave NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	3.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	105	14	201	123	4	356
Future Vol, veh/h	105	14	201	123	4	356
Conflicting Peds, #/hr	2	2	0	2	2	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	73	73	73	73	73	73
Heavy Vehicles, %	1	0	2	0	0	3
Mvmt Flow	144	19	275	168	5	488

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	861	363	0	0	445	0
Stage 1	361	-	-	-	-	-
Stage 2	500	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	327	686	-	-	1126	-
Stage 1	707	-	-	-	-	-
Stage 2	611	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	324	684	-	-	1124	-
Mov Cap-2 Maneuver	324	-	-	-	-	-
Stage 1	706	-	-	-	-	-
Stage 2	606	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	24.4	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	345	1124	-
HCM Lane V/C Ratio	-	-	0.473	0.005	-
HCM Control Delay (s)	-	-	24.4	8.2	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	2.4	0	-

Lanes, Volumes, Timings
5: NE 75th Street & LWHS West Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	94	36	50	92	48	66
Future Volume (vph)	94	36	50	92	48	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		742	612		229	
Travel Time (s)		20.2	16.7		6.2	
Confl. Peds. (#/hr)	2			2	2	2
Peak Hour Factor	0.42	0.42	0.42	0.42	0.42	0.42
Heavy Vehicles (%)	0%	0%	0%	0%	6%	2%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
5: NE 75th Street & LWHS West Driveway

11/12/2018

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	94	36	50	92	48	66
Future Vol, veh/h	94	36	50	92	48	66
Conflicting Peds, #/hr	2	0	0	2	2	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	42	42	42	42	42	42
Heavy Vehicles, %	0	0	0	0	6	2
Mvmt Flow	224	86	119	219	114	157

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	340	0	-	0	767	233
Stage 1	-	-	-	-	231	-
Stage 2	-	-	-	-	536	-
Critical Hdwy	4.1	-	-	-	6.46	6.22
Critical Hdwy Stg 1	-	-	-	-	5.46	-
Critical Hdwy Stg 2	-	-	-	-	5.46	-
Follow-up Hdwy	2.2	-	-	-	3.554	3.318
Pot Cap-1 Maneuver	1230	-	-	-	365	806
Stage 1	-	-	-	-	798	-
Stage 2	-	-	-	-	579	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1228	-	-	-	294	803
Mov Cap-2 Maneuver	-	-	-	-	294	-
Stage 1	-	-	-	-	643	-
Stage 2	-	-	-	-	578	-

Approach	EB	WB	SB
HCM Control Delay, s	6.2	0	23.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1228	-	-	-	464
HCM Lane V/C Ratio	0.182	-	-	-	0.585
HCM Control Delay (s)	8.6	0	-	-	23.1
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.7	-	-	-	3.7

Lanes, Volumes, Timings
6: 120th Ave NE & NE 75th Street

11/12/2018

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	99	59	99	77	56	28
Future Volume (vph)	99	59	99	77	56	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25			25	25	
Link Distance (ft)	612			123	328	
Travel Time (s)	16.7			3.4	8.9	
Confl. Peds. (#/hr)		63	47		63	47
Peak Hour Factor	0.70	0.70	0.70	0.70	0.70	0.70
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

Intersection	
Int Delay, s/veh	5.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	99	59	99	77	56	28
Future Vol, veh/h	99	59	99	77	56	28
Conflicting Peds, #/hr	0	63	47	0	63	47
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	70	70	70	70	70	70
Heavy Vehicles, %	3	0	0	0	0	0
Mvmt Flow	141	84	141	110	80	40

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	288	0	701	293
Stage 1	-	-	-	-	246	-
Stage 2	-	-	-	-	455	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1286	-	408	751
Stage 1	-	-	-	-	800	-
Stage 2	-	-	-	-	643	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1218	-	322	684
Mov Cap-2 Maneuver	-	-	-	-	322	-
Stage 1	-	-	-	-	758	-
Stage 2	-	-	-	-	534	-

Approach	EB	WB	NB
HCM Control Delay, s	0	4.7	18.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	391	-	-	1218	-
HCM Lane V/C Ratio	0.307	-	-	0.116	-
HCM Control Delay (s)	18.2	-	-	8.3	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.3	-	-	0.4	-

Lanes, Volumes, Timings
7: NE 75th Street & LWHS East Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	27	99	164	73	30	11
Future Volume (vph)	27	99	164	73	30	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		123	513		219	
Travel Time (s)		3.4	14.0		6.0	
Confl. Peds. (#/hr)	47			9	9	47
Peak Hour Factor	0.59	0.59	0.59	0.59	0.59	0.59
Heavy Vehicles (%)	0%	2%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
7: NE 75th Street & LWHS East Driveway

11/12/2018

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	99	164	73	30	11
Future Vol, veh/h	27	99	164	73	30	11
Conflicting Peds, #/hr	47	0	0	9	9	47
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	59	59	59	59	59	59
Heavy Vehicles, %	0	2	0	0	0	0
Mvmt Flow	46	168	278	124	51	19

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	449	0	-	0	656	434
Stage 1	-	-	-	-	387	-
Stage 2	-	-	-	-	269	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1122	-	-	-	433	626
Stage 1	-	-	-	-	691	-
Stage 2	-	-	-	-	781	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1078	-	-	-	381	578
Mov Cap-2 Maneuver	-	-	-	-	381	-
Stage 1	-	-	-	-	633	-
Stage 2	-	-	-	-	751	-

Approach	EB	WB	SB
HCM Control Delay, s	1.8	0	15.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1078	-	-	-	419
HCM Lane V/C Ratio	0.042	-	-	-	0.166
HCM Control Delay (s)	8.5	0	-	-	15.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6

Lanes, Volumes, Timings
8: 122nd Ave NE & NE 75th Street

11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	23	57	3	39	2	73	43	0	3	81	128
Future Volume (vph)	48	23	57	3	39	2	73	43	0	3	81	128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		513			178			239			1295	
Travel Time (s)		14.0			4.9			6.5			35.3	
Confl. Peds. (#/hr)	40		15	3		28	15		3	28		40
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Heavy Vehicles (%)	4%	0%	0%	0%	0%	0%	2%	0%	0%	33%	0%	2%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	

HCM 6th TWSC
8: 122nd Ave NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	48	23	57	3	39	2	73	43	0	3	81	128
Future Vol, veh/h	48	23	57	3	39	2	73	43	0	3	81	128
Conflicting Peds, #/hr	40	0	15	3	0	28	15	0	3	28	0	40
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	67	67	67	67	67	67	67	67	67	67	67	67
Heavy Vehicles, %	4	0	0	0	0	0	2	0	0	33	0	2
Mvmt Flow	72	34	85	4	58	3	109	64	0	4	121	191

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	618	575	272	609	670	132	352	0	0	92	0	0
Stage 1	265	265	-	310	310	-	-	-	-	-	-	-
Stage 2	353	310	-	299	360	-	-	-	-	-	-	-
Critical Hdwy	7.14	6.5	6.2	7.1	6.5	6.2	4.12	-	-	4.43	-	-
Critical Hdwy Stg 1	6.14	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.14	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.536	4	3.3	3.5	4	3.3	2.218	-	-	2.497	-	-
Pot Cap-1 Maneuver	399	431	772	410	381	923	1207	-	-	1329	-	-
Stage 1	736	693	-	705	663	-	-	-	-	-	-	-
Stage 2	660	663	-	714	630	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	296	366	737	300	324	871	1167	-	-	1298	-	-
Mov Cap-2 Maneuver	296	366	-	300	324	-	-	-	-	-	-	-
Stage 1	643	667	-	622	585	-	-	-	-	-	-	-
Stage 2	517	585	-	589	607	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.3	18.5	5.3	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1167	-	-	423	332	1298	-	-
HCM Lane V/C Ratio	0.093	-	-	0.452	0.198	0.003	-	-
HCM Control Delay (s)	8.4	0	-	20.3	18.5	7.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0.3	-	-	2.3	0.7	0	-	-

2020 With Project Afternoon Peak Hour

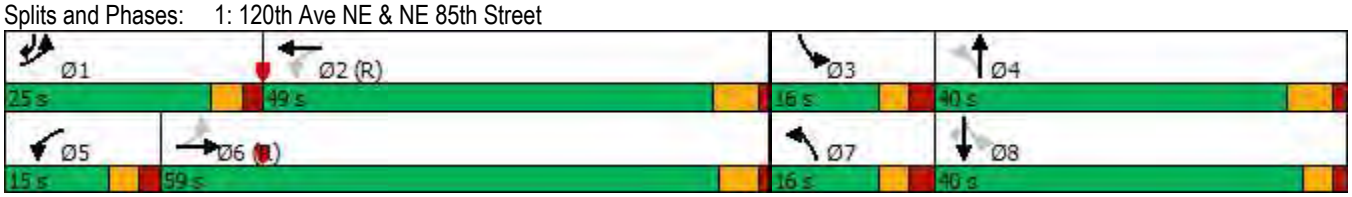
Lanes, Volumes, Timings
1: 120th Ave NE & NE 85th Street

11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	222	1250	126	30	1151	54	270	119	68	87	68	372
Future Volume (vph)	222	1250	126	30	1151	54	270	119	68	87	68	372
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	100		0	60		0	100		240
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			35			30			30	
Link Distance (ft)		511			505			1405			524	
Travel Time (s)		11.6			9.8			31.9			11.9	
Confl. Peds. (#/hr)	1		21	21		1	6		5	5		6
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	1%	3%	4%	0%	2%	2%	2%	2%	0%	0%	2%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	1	6		5	2		7	4		3	8	1
Permitted Phases	6			2			4			8		8
Detector Phase	1	6		5	2		7	4		3	8	1
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	15.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	11.0	27.0		11.0	33.5		11.5	35.0		11.5	36.5	11.0
Total Split (s)	25.0	59.0		15.0	49.0		16.0	40.0		16.0	40.0	25.0
Total Split (%)	19.2%	45.4%		11.5%	37.7%		12.3%	30.8%		12.3%	30.8%	19.2%
Yellow Time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	3.0	3.0
All-Red Time (s)	2.0	1.0		2.0	1.0		2.5	1.5		2.5	1.5	2.0
Lost Time Adjust (s)	0.0	-1.0		0.0	-1.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0		5.0	4.5		5.5	6.0		5.5	4.5	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?							Yes				Yes	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 120 (92%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 105	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: 120th Ave NE & NE 85th Street



HCM 6th Signalized Intersection Summary
1: 120th Ave NE & NE 85th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	222	1250	126	30	1151	54	270	119	68	87	68	372
Future Volume (veh/h)	222	1250	126	30	1151	54	270	119	68	87	68	372
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1856	1856	1900	1870	1870	1870	1870	1870	1900	1870	1885
Adj Flow Rate, veh/h	239	1344	135	32	1238	58	290	128	73	94	73	400
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	1	3	3	0	2	2	2	2	2	0	2	1
Cap, veh/h	265	1563	156	151	1449	68	393	302	172	360	453	537
Arrive On Green	0.10	0.48	0.48	0.03	0.42	0.41	0.08	0.27	0.27	0.05	0.24	0.24
Sat Flow, veh/h	1795	3229	323	1810	3452	162	1781	1115	636	1810	1870	1586
Grp Volume(v), veh/h	239	730	749	32	637	659	290	0	201	94	73	400
Grp Sat Flow(s),veh/h/ln	1795	1763	1789	1810	1777	1836	1781	0	1751	1810	1870	1586
Q Serve(g_s), s	10.3	47.5	48.3	1.3	42.1	42.3	10.5	0.0	12.3	5.0	4.0	29.0
Cycle Q Clear(g_c), s	10.3	47.5	48.3	1.3	42.1	42.3	10.5	0.0	12.3	5.0	4.0	29.0
Prop In Lane	1.00		0.18	1.00		0.09	1.00		0.36	1.00		1.00
Lane Grp Cap(c), veh/h	265	853	866	151	746	771	393	0	474	360	453	537
V/C Ratio(X)	0.90	0.86	0.86	0.21	0.85	0.86	0.74	0.00	0.42	0.26	0.16	0.74
Avail Cap(c_a), veh/h	369	853	866	233	746	771	393	0	474	412	511	586
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	0.71	0.00	0.71	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.9	29.6	29.9	27.2	34.1	34.2	38.3	0.0	39.1	34.4	38.8	38.1
Incr Delay (d2), s/veh	16.2	10.8	11.2	0.2	10.6	10.4	4.5	0.0	0.2	0.1	0.1	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.5	22.2	23.0	0.6	19.9	20.6	3.7	0.0	5.3	2.2	1.9	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.2	40.3	41.1	27.4	44.7	44.6	42.9	0.0	39.2	34.6	38.9	42.0
LnGrp LOS	D	D	D	C	D	D	D	A	D	C	D	D
Approach Vol, veh/h		1718			1328			491			567	
Approach Delay, s/veh		41.6			44.2			41.4			40.4	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.5	59.1	12.3	41.2	9.1	67.4	16.0	37.5
Change Period (Y+Rc), s	5.0	5.5	5.5	6.0	5.0	* 5.5	5.5	* 6
Max Green Setting (Gmax), s	20.0	43.5	10.5	34.0	10.0	* 54	10.5	* 36
Max Q Clear Time (g_c+I1), s	12.3	44.3	7.0	14.3	3.3	50.3	12.5	31.0
Green Ext Time (p_c), s	0.1	0.0	0.0	0.3	0.0	1.8	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	42.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
2: LWHS/120th Ave NE & NE 80th Street

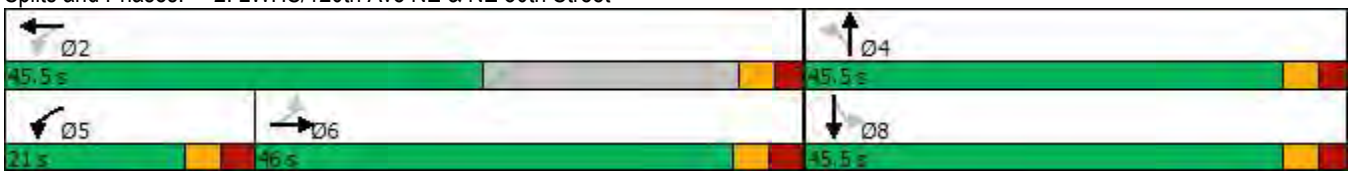
11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	210	40	89	153	100	42	208	170	59	89	64
Future Volume (vph)	119	210	40	89	153	100	42	208	170	59	89	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		660			516			244			1405	
Travel Time (s)		18.0			14.1			6.7			38.3	
Confl. Peds. (#/hr)	34		41	41		34	95		144	144		95
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Heavy Vehicles (%)	2%	2%	0%	4%	4%	1%	0%	2%	0%	2%	2%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	29.0	29.0		12.0	25.5		32.5	32.5		26.5	26.5	
Total Split (s)	46.0	46.0		21.0	45.5		45.5	45.5		45.5	45.5	
Total Split (%)	40.9%	40.9%		18.7%	40.4%		40.4%	40.4%		40.4%	40.4%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	5.5		5.5	5.5			5.5	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 112.5
Actuated Cycle Length: 70.8
Natural Cycle: 75
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: LWHS/120th Ave NE & NE 80th Street



HCM 6th Signalized Intersection Summary
2: LWHS/120th Ave NE & NE 80th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	210	40	89	153	100	42	208	170	59	89	64
Future Volume (veh/h)	119	210	40	89	153	100	42	208	170	59	89	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.95		0.92	0.97		0.95	1.00		0.82	0.93		0.82
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1841	1841	1841	1900	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	137	241	46	102	176	115	48	239	195	68	102	74
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	4	4	4	0	2	2	2	2	2
Cap, veh/h	388	410	78	378	444	290	401	338	276	126	173	101
Arrive On Green	0.27	0.27	0.27	0.08	0.44	0.44	0.39	0.39	0.39	0.39	0.39	0.39
Sat Flow, veh/h	1034	1504	287	1753	1018	665	1228	859	701	147	440	255
Grp Volume(v), veh/h	137	0	287	102	0	291	48	0	434	244	0	0
Grp Sat Flow(s),veh/h/ln	1034	0	1791	1753	0	1682	1228	0	1559	842	0	0
Q Serve(g_s), s	7.5	0.0	9.4	2.6	0.0	8.0	0.0	0.0	15.8	5.2	0.0	0.0
Cycle Q Clear(g_c), s	7.5	0.0	9.4	2.6	0.0	8.0	3.4	0.0	15.8	21.1	0.0	0.0
Prop In Lane	1.00		0.16	1.00		0.40	1.00		0.45	0.28		0.30
Lane Grp Cap(c), veh/h	388	0	488	378	0	735	401	0	614	399	0	0
V/C Ratio(X)	0.35	0.00	0.59	0.27	0.00	0.40	0.12	0.00	0.71	0.61	0.00	0.00
Avail Cap(c_a), veh/h	716	0	1057	633	0	993	643	0	920	654	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	20.7	0.0	21.4	15.0	0.0	13.0	13.5	0.0	17.3	18.0	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.4	0.1	0.0	0.1	0.2	0.0	1.8	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	3.8	1.0	0.0	2.8	0.5	0.0	5.6	3.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.9	0.0	21.8	15.1	0.0	13.1	13.7	0.0	19.1	18.6	0.0	0.0
LnGrp LOS	C	A	C	B	A	B	B	A	B	B	A	A
Approach Vol, veh/h		424			393			482			244	
Approach Delay, s/veh		21.5			13.7			18.5			18.6	
Approach LOS		C			B			B			B	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		35.6		32.2	11.1	24.5		32.2				
Change Period (Y+Rc), s		* 6		5.5	6.0	6.0		5.5				
Max Green Setting (Gmax), s		* 40		40.0	15.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s		10.0		17.8	4.6	11.4		23.1				
Green Ext Time (p_c), s		1.3		4.1	0.1	1.6		1.1				

Intersection Summary	
HCM 6th Ctrl Delay	18.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
3: NE 80th Street & 122nd Ave NE

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	51	393	302	46	48	44
Future Volume (vph)	51	393	302	46	48	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		516	180		1399	
Travel Time (s)		14.1	4.9		38.2	
Confl. Peds. (#/hr)	57			56	56	57
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	0%	1%	3%	2%	2%	3%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
3: NE 80th Street & 122nd Ave NE

11/12/2018

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	51	393	302	46	48	44
Future Vol, veh/h	51	393	302	46	48	44
Conflicting Peds, #/hr	57	0	0	56	56	57
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	0	1	3	2	2	3
Mvmt Flow	55	423	325	49	52	47

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	431	0	-	0	996	464
Stage 1	-	-	-	-	407	-
Stage 2	-	-	-	-	589	-
Critical Hdwy	4.1	-	-	-	6.42	6.23
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.2	-	-	-	3.518	3.327
Pot Cap-1 Maneuver	1139	-	-	-	271	596
Stage 1	-	-	-	-	672	-
Stage 2	-	-	-	-	554	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1085	-	-	-	230	541
Mov Cap-2 Maneuver	-	-	-	-	230	-
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	528	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	21.4
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1085	-	-	-	317
HCM Lane V/C Ratio	0.051	-	-	-	0.312
HCM Control Delay (s)	8.5	0	-	-	21.4
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.2	-	-	-	1.3

Lanes, Volumes, Timings
4: 116th Ave NE & NE 75th Street

11/12/2018

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	143	12	368	59	3	260
Future Volume (vph)	143	12	368	59	3	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25		25			25
Link Distance (ft)	742		296			360
Travel Time (s)	20.2		8.1			9.8
Confl. Peds. (#/hr)	8	13		8	13	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Heavy Vehicles (%)	1%	0%	2%	2%	0%	2%
Shared Lane Traffic (%)						
Sign Control	Stop		Free			Free

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
4: 116th Ave NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	4.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	143	12	368	59	3	260
Future Vol, veh/h	143	12	368	59	3	260
Conflicting Peds, #/hr	8	13	0	8	13	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	1	0	2	2	0	2
Mvmt Flow	163	14	418	67	3	295

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	774	478	0	0	498	0
Stage 1	465	-	-	-	-	-
Stage 2	309	-	-	-	-	-
Critical Hdwy	6.41	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	368	591	-	-	1076	-
Stage 1	634	-	-	-	-	-
Stage 2	747	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	360	578	-	-	1064	-
Mov Cap-2 Maneuver	360	-	-	-	-	-
Stage 1	627	-	-	-	-	-
Stage 2	740	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	23.2	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	371	1064	-
HCM Lane V/C Ratio	-	-	0.475	0.003	-
HCM Control Delay (s)	-	-	23.2	8.4	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	2.5	0	-

Lanes, Volumes, Timings
5: NE 75th Street & LWHS West Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	22	42	49	10	104	107
Future Volume (vph)	22	42	49	10	104	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		742	612		229	
Travel Time (s)		20.2	16.7		6.2	
Confl. Peds. (#/hr)	11			8	8	11
Peak Hour Factor	0.58	0.58	0.58	0.58	0.58	0.58
Heavy Vehicles (%)	0%	3%	0%	0%	3%	1%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
5: NE 75th Street & LWHS West Driveway

11/12/2018

Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	42	49	10	104	107
Future Vol, veh/h	22	42	49	10	104	107
Conflicting Peds, #/hr	11	0	0	8	8	11
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	58	58	58	58	58	58
Heavy Vehicles, %	0	3	0	0	3	1
Mvmt Flow	38	72	84	17	179	184

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	112	0	-	0	260	115
Stage 1	-	-	-	-	104	-
Stage 2	-	-	-	-	156	-
Critical Hdwy	4.1	-	-	-	6.43	6.21
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	2.2	-	-	-	3.527	3.309
Pot Cap-1 Maneuver	1490	-	-	-	727	940
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	870	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1476	-	-	-	695	923
Mov Cap-2 Maneuver	-	-	-	-	695	-
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	862	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1476	-	-	-	795
HCM Lane V/C Ratio	0.026	-	-	-	0.458
HCM Control Delay (s)	7.5	0	-	-	13.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	2.4

Lanes, Volumes, Timings
6: 120th Avenue NE & NE 75th Street

11/12/2018

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	145	60	65	29	18	53
Future Volume (vph)	145	60	65	29	18	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)	25			25	25	
Link Distance (ft)	612			123	299	
Travel Time (s)	16.7			3.4	8.2	
Confl. Peds. (#/hr)		101	128		101	128
Peak Hour Factor	0.67	0.67	0.67	0.67	0.67	0.67
Heavy Vehicles (%)	3%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
6: 120th Avenue NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	4.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	145	60	65	29	18	53
Future Vol, veh/h	145	60	65	29	18	53
Conflicting Peds, #/hr	0	101	128	0	101	128
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	67	67	67	67	67	67
Heavy Vehicles, %	3	0	0	0	0	0
Mvmt Flow	216	90	97	43	27	79

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	434	0	727	517
Stage 1	-	-	-	-	389	-
Stage 2	-	-	-	-	338	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1136	-	394	562
Stage 1	-	-	-	-	689	-
Stage 2	-	-	-	-	727	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1015	-	291	449
Mov Cap-2 Maneuver	-	-	-	-	291	-
Stage 1	-	-	-	-	615	-
Stage 2	-	-	-	-	601	-

Approach	EB	WB	NB
HCM Control Delay, s	0	6.2	17.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	395	-	-	1015	-
HCM Lane V/C Ratio	0.268	-	-	0.096	-
HCM Control Delay (s)	17.4	-	-	8.9	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.1	-	-	0.3	-

Lanes, Volumes, Timings
7: NE 75th Street & LWHS East Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	27	171	82	27	34	15
Future Volume (vph)	27	171	82	27	34	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		123	513		219	
Travel Time (s)		3.4	14.0		6.0	
Confl. Peds. (#/hr)	115			5	5	115
Peak Hour Factor	0.68	0.68	0.68	0.68	0.68	0.68
Heavy Vehicles (%)	0%	3%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
7: NE 75th Street & LWHS East Driveway

11/12/2018

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	171	82	27	34	15
Future Vol, veh/h	27	171	82	27	34	15
Conflicting Peds, #/hr	115	0	0	5	5	115
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	68	68	68	68	68	68
Heavy Vehicles, %	0	3	0	0	0	0
Mvmt Flow	40	251	121	40	50	22

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	276	0	-	0	592	371
Stage 1	-	-	-	-	256	-
Stage 2	-	-	-	-	336	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1299	-	-	-	472	679
Stage 1	-	-	-	-	791	-
Stage 2	-	-	-	-	728	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1175	-	-	-	371	555
Mov Cap-2 Maneuver	-	-	-	-	371	-
Stage 1	-	-	-	-	687	-
Stage 2	-	-	-	-	658	-

Approach	EB	WB	SB
HCM Control Delay, s	1.1	0	15.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1175	-	-	-	413
HCM Lane V/C Ratio	0.034	-	-	-	0.174
HCM Control Delay (s)	8.2	0	-	-	15.6
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6

Lanes, Volumes, Timings
8: 122nd Ave NE & NE 75th Street

11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	109	36	50	2	18	2	42	68	3	8	57	69
Future Volume (vph)	109	36	50	2	18	2	42	68	3	8	57	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		513			178			239			1295	
Travel Time (s)		14.0			4.9			6.5			35.3	
Confl. Peds. (#/hr)	59		16	6		49	16		6	49		59
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles (%)	1%	3%	0%	0%	6%	0%	0%	2%	0%	0%	2%	5%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
8: 122nd Ave NE & NE 75th Street

11/12/2018

Intersection	
Int Delay, s/veh	9.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	109	36	50	2	18	2	42	68	3	8	57	69
Future Vol, veh/h	109	36	50	2	18	2	42	68	3	8	57	69
Conflicting Peds, #/hr	59	0	16	6	0	49	16	0	6	49	0	59
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	1	3	0	0	6	0	0	2	0	0	2	5
Mvmt Flow	133	44	61	2	22	2	51	83	4	10	70	84

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	449	429	187	437	469	193	213	0	0	136	0	0
Stage 1	191	191	-	236	236	-	-	-	-	-	-	-
Stage 2	258	238	-	201	233	-	-	-	-	-	-	-
Critical Hdwy	7.11	6.53	6.2	7.1	6.56	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	6.11	5.53	-	6.1	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.11	5.53	-	6.1	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.509	4.027	3.3	3.5	4.054	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	522	517	860	533	486	854	1369	-	-	1461	-	-
Stage 1	813	740	-	772	702	-	-	-	-	-	-	-
Stage 2	749	706	-	805	704	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	435	449	807	416	422	779	1302	-	-	1401	-	-
Mov Cap-2 Maneuver	435	449	-	416	422	-	-	-	-	-	-	-
Stage 1	741	698	-	710	646	-	-	-	-	-	-	-
Stage 2	658	650	-	683	664	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.7	13.7	2.9	0.5
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1302	-	-	497	440	1401	-	-
HCM Lane V/C Ratio	0.039	-	-	0.478	0.061	0.007	-	-
HCM Control Delay (s)	7.9	0	-	18.7	13.7	7.6	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	2.6	0.2	0	-	-

2020 With Project PM Peak Hour

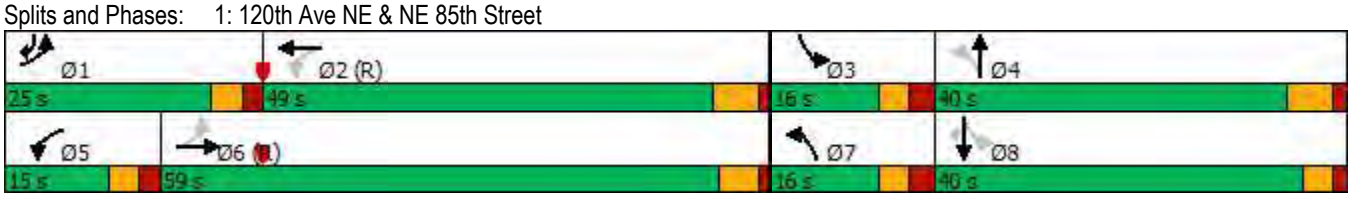
Lanes, Volumes, Timings
1: 120th Ave NE & NE 85th Street

11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	248	1647	112	15	1297	54	289	120	47	63	67	321
Future Volume (vph)	248	1647	112	15	1297	54	289	120	47	63	67	321
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	400		0	100		0	60		0	100		240
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Right Turn on Red			No			No			No			No
Link Speed (mph)		30			35			30			30	
Link Distance (ft)		511			505			1405			524	
Travel Time (s)		11.6			9.8			31.9			11.9	
Confl. Peds. (#/hr)	9		5	5		9	9		9	9		9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	0%	1%	2%	8%	1%	0%	1%	0%	2%	0%	0%	1%
Shared Lane Traffic (%)												
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	1	6		5	2		7	4		3	8	1
Permitted Phases	6			2			4			8		8
Detector Phase	1	6		5	2		7	4		3	8	1
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	15.0		6.0	6.0		6.0	6.0	6.0
Minimum Split (s)	11.0	27.0		11.0	33.5		11.5	35.0		11.5	36.5	11.0
Total Split (s)	25.0	59.0		15.0	49.0		16.0	40.0		16.0	40.0	25.0
Total Split (%)	19.2%	45.4%		11.5%	37.7%		12.3%	30.8%		12.3%	30.8%	19.2%
Yellow Time (s)	3.0	4.0		3.0	4.5		3.0	4.5		3.0	3.0	3.0
All-Red Time (s)	2.0	1.0		2.0	1.0		2.5	1.5		2.5	1.5	2.0
Lost Time Adjust (s)	0.0	-1.0		0.0	-1.0		0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	5.0	4.0		5.0	4.5		5.5	6.0		5.5	4.5	5.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lead
Lead-Lag Optimize?							Yes				Yes	
Recall Mode	None	C-Min		None	C-Min		None	None		None	None	None

Intersection Summary	
Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 120 (92%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 135	
Control Type: Actuated-Coordinated	

Splits and Phases: 1: 120th Ave NE & NE 85th Street



HCM 6th Signalized Intersection Summary
1: 120th Ave NE & NE 85th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	248	1647	112	15	1297	54	289	120	47	63	67	321
Future Volume (veh/h)	248	1647	112	15	1297	54	289	120	47	63	67	321
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1900	1885	1885	1781	1885	1885	1885	1900	1900	1900	1900	1885
Adj Flow Rate, veh/h	261	1734	118	16	1365	57	304	126	49	66	71	338
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	1	1	8	1	1	1	0	0	0	0	1
Cap, veh/h	286	1782	120	92	1497	62	380	328	128	341	406	523
Arrive On Green	0.12	0.52	0.52	0.02	0.43	0.42	0.08	0.25	0.25	0.04	0.21	0.21
Sat Flow, veh/h	1810	3403	229	1697	3502	146	1795	1298	505	1810	1900	1577
Grp Volume(v), veh/h	261	904	948	16	697	725	304	0	175	66	71	338
Grp Sat Flow(s),veh/h/ln	1810	1791	1842	1697	1791	1857	1795	0	1803	1810	1900	1577
Q Serve(g_s), s	13.0	63.2	65.7	0.7	47.4	47.7	10.5	0.0	10.4	3.7	4.0	23.7
Cycle Q Clear(g_c), s	13.0	63.2	65.7	0.7	47.4	47.7	10.5	0.0	10.4	3.7	4.0	23.7
Prop In Lane	1.00		0.12	1.00		0.08	1.00		0.28	1.00		1.00
Lane Grp Cap(c), veh/h	286	938	964	92	766	794	380	0	456	341	406	523
V/C Ratio(X)	0.91	0.96	0.98	0.17	0.91	0.91	0.80	0.00	0.38	0.19	0.17	0.65
Avail Cap(c_a), veh/h	354	938	964	188	766	794	380	0	471	411	519	617
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.87	0.87	0.87	0.92	0.00	0.92	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.4	29.8	30.5	31.9	34.9	35.0	41.6	0.0	40.2	37.5	41.7	37.1
Incr Delay (d2), s/veh	21.7	21.9	25.1	0.3	15.1	15.0	10.0	0.0	0.2	0.1	0.1	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.1	31.9	34.7	0.3	23.3	24.2	5.2	0.0	4.7	1.7	1.9	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.1	51.7	55.6	32.2	50.0	50.0	51.6	0.0	40.4	37.6	41.8	38.2
LnGrp LOS	E	D	E	C	D	D	D	A	D	D	D	D
Approach Vol, veh/h		2113			1438			479			475	
Approach Delay, s/veh		54.4			49.8			47.5			38.6	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.1	60.1	10.9	38.8	7.6	72.6	16.0	33.8
Change Period (Y+Rc), s	5.0	5.5	5.5	6.0	5.0	* 5.5	5.5	* 6
Max Green Setting (Gmax), s	20.0	43.5	10.5	34.0	10.0	* 54	10.5	* 36
Max Q Clear Time (g_c+I1), s	15.0	49.7	5.7	12.4	2.7	67.7	12.5	25.7
Green Ext Time (p_c), s	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	50.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
2: LWHS/120th Ave NE & NE 80th Street

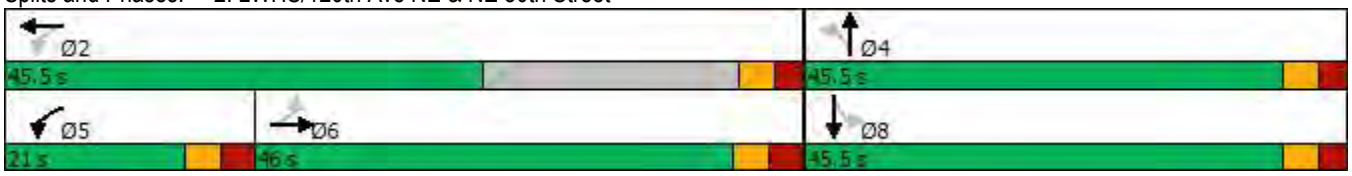
11/12/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	176	452	13	47	178	230	10	41	36	89	35	53
Future Volume (vph)	176	452	13	47	178	230	10	41	36	89	35	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	125		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Right Turn on Red			Yes			Yes			Yes			Yes
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		660			516			244			1405	
Travel Time (s)		18.0			14.1			6.7			38.3	
Confl. Peds. (#/hr)	1		6	6		1	3		8	8		3
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles (%)	1%	1%	0%	3%	2%	1%	14%	4%	4%	1%	4%	0%
Shared Lane Traffic (%)												
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			4			8	
Permitted Phases	6			2			4			8		
Detector Phase	6	6		5	2		4	4		8	8	
Switch Phase												
Minimum Initial (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Minimum Split (s)	29.0	29.0		12.0	25.5		32.5	32.5		26.5	26.5	
Total Split (s)	46.0	46.0		21.0	45.5		45.5	45.5		45.5	45.5	
Total Split (%)	40.9%	40.9%		18.7%	40.4%		40.4%	40.4%		40.4%	40.4%	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	3.0	3.0		3.0	2.5		2.5	2.5		2.5	2.5	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0			0.0	
Total Lost Time (s)	6.0	6.0		6.0	5.5		5.5	5.5			5.5	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?	Yes	Yes		Yes								
Recall Mode	None	None		None	None		None	None		None	None	

Intersection Summary

Area Type: Other
Cycle Length: 112.5
Actuated Cycle Length: 55
Natural Cycle: 75
Control Type: Actuated-Uncoordinated

Splits and Phases: 2: LWHS/120th Ave NE & NE 80th Street



HCM 6th Signalized Intersection Summary
2: LWHS/120th Ave NE & NE 80th Street

11/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	176	452	13	47	178	230	10	41	36	89	35	53
Future Volume (veh/h)	176	452	13	47	178	230	10	41	36	89	35	53
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.98	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1856	1870	1870	1693	1841	1841	1841	1841	1841
Adj Flow Rate, veh/h	185	476	14	49	187	242	11	43	38	94	37	56
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	3	2	2	14	4	4	4	4	4
Cap, veh/h	496	639	19	375	401	519	411	181	160	237	88	88
Arrive On Green	0.35	0.35	0.35	0.06	0.54	0.54	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	962	1821	54	1767	738	955	1165	892	788	578	431	431
Grp Volume(v), veh/h	185	0	490	49	0	429	11	0	81	187	0	0
Grp Sat Flow(s),veh/h/ln	962	0	1875	1767	0	1692	1165	0	1680	1440	0	0
Q Serve(g_s), s	7.0	0.0	10.4	0.7	0.0	7.0	0.0	0.0	1.8	3.5	0.0	0.0
Cycle Q Clear(g_c), s	7.0	0.0	10.4	0.7	0.0	7.0	0.3	0.0	1.8	5.4	0.0	0.0
Prop In Lane	1.00		0.03	1.00		0.56	1.00		0.47	0.50		0.30
Lane Grp Cap(c), veh/h	496	0	658	375	0	920	411	0	342	412	0	0
V/C Ratio(X)	0.37	0.00	0.75	0.13	0.00	0.47	0.03	0.00	0.24	0.45	0.00	0.00
Avail Cap(c_a), veh/h	1005	0	1649	850	0	1489	1199	0	1478	1382	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	11.9	0.0	13.0	8.7	0.0	6.3	14.5	0.0	15.2	16.5	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.6	0.1	0.0	0.1	0.0	0.0	0.4	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	3.8	0.2	0.0	1.8	0.1	0.0	0.7	1.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.0	0.0	13.6	8.8	0.0	6.5	14.6	0.0	15.6	16.8	0.0	0.0
LnGrp LOS	B	A	B	A	A	A	B	A	B	B	A	A
Approach Vol, veh/h		675			478			92			187	
Approach Delay, s/veh		13.2			6.7			15.5			16.8	
Approach LOS		B			A			B			B	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		30.7		14.8	8.8	21.9		14.8				
Change Period (Y+Rc), s		* 6		5.5	6.0	6.0		5.5				
Max Green Setting (Gmax), s		* 40		40.0	15.0	40.0		40.0				
Max Q Clear Time (g_c+I1), s		9.0		3.8	2.7	12.4		7.4				
Green Ext Time (p_c), s		2.1		0.6	0.0	2.9		0.8				

Intersection Summary	
HCM 6th Ctrl Delay	11.6
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lanes, Volumes, Timings
5: NE 75th Street & LWHS West Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	12	18	28	3	10	15
Future Volume (vph)	12	18	28	3	10	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		742	735		229	
Travel Time (s)		20.2	20.0		6.2	
Confl. Peds. (#/hr)	4			4	4	4
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
5: NE 75th Street & LWHS West Driveway

11/12/2018

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	18	28	3	10	15
Future Vol, veh/h	12	18	28	3	10	15
Conflicting Peds, #/hr	4	0	0	4	4	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	14	22	34	4	12	18

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	42	0	-	0	94	44
Stage 1	-	-	-	-	40	-
Stage 2	-	-	-	-	54	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1580	-	-	-	911	1032
Stage 1	-	-	-	-	988	-
Stage 2	-	-	-	-	974	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1575	-	-	-	897	1025
Mov Cap-2 Maneuver	-	-	-	-	897	-
Stage 1	-	-	-	-	976	-
Stage 2	-	-	-	-	971	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	8.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1575	-	-	-	970
HCM Lane V/C Ratio	0.009	-	-	-	0.031
HCM Control Delay (s)	7.3	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Lanes, Volumes, Timings
7: NE 75th Street & LWHS East Driveway

11/12/2018

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	7	46	43	24	16	9
Future Volume (vph)	7	46	43	24	16	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Link Speed (mph)		25	25		25	
Link Distance (ft)		735	513		219	
Travel Time (s)		20.0	14.0		6.0	
Confl. Peds. (#/hr)	38			14	14	38
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%
Shared Lane Traffic (%)						
Sign Control		Free	Free		Stop	

Intersection Summary	
Area Type:	Other

Control Type: Unsignalized

HCM 6th TWSC
7: NE 75th Street & LWHS East Driveway

11/12/2018

Intersection	
Int Delay, s/veh	2.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	7	46	43	24	16	9
Future Vol, veh/h	7	46	43	24	16	9
Conflicting Peds, #/hr	38	0	0	14	14	38
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	84	84	84	84	84	84
Heavy Vehicles, %	0	0	0	0	0	0
Mvmt Flow	8	55	51	29	19	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	118	0	-	0	189	142
Stage 1	-	-	-	-	104	-
Stage 2	-	-	-	-	85	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1483	-	-	-	805	911
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	943	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1436	-	-	-	749	854
Mov Cap-2 Maneuver	-	-	-	-	749	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	913	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1436	-	-	-	784
HCM Lane V/C Ratio	0.006	-	-	-	0.038
HCM Control Delay (s)	7.5	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Appendix C

Existing Trip Generation Study

Lake Washington High School Trip Generation Study

TENW Project No. 5786

2-Day Average Trip Generation

AM PEAK HOUR

	Total Trips - AM Peak Hour								
	Tuesday, September 18, 2018			Thursday, September 20, 2018			2-Day Average		
Peak Hour	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
7:15-8:15 am	779	490	1,269	788	500	1,288	784	495	1,279
							61%	39%	

AFTERNOON PEAK HOUR

	Total Trips - Afternoon Peak Hour								
	Tuesday, September 18, 2018			Thursday, September 20, 2018			2-Day Average		
Peak Hour	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
2:30-3:30 pm				262	464	726	247	498	745
2:45-3:45 pm	232	531	763						
							33%	67%	

PM PEAK HOUR

	Total Trips - PM Peak Hour								
	Tuesday, September 18, 2018			Thursday, September 20, 2018			2-Day Average		
Peak Hour	IN	OUT	TOTAL	IN	OUT	TOTAL	IN	OUT	TOTAL
4:00-5:00 pm	94	127	221				109	127	236
4:30-5:30 pm				123	128	251			
							46%	54%	

Lake Washington High School Trip Generation Study
AM Peak Hour
Day: Tuesday, September 18, 2018

Interval	#1 NE 80th St/120th Ave NE (Main Access)		#2 NE 75th Street / West Driveway		#3 NE 75th Street / East Driveway		Total Trips			Hourly Totals	
Begin	In	Out	In	Out	In	Out	In	Out	Total		
7:00 AM	34	15	11	1	8	1	53	17	70		
7:15 AM	84	33	16	6	12	2	112	41	153		
7:30 AM	191	97	37	17	23	4	251	118	369		
7:45 AM	235	186	99	52	47	23	381	261	642	1,234	7:00 am - 8:00 am
8:00 AM	27	58	4	9	4	3	35	70	105	1,269	7:15 am - 8:15 am
8:15 AM	12	6	1	3	3	0	16	9	25	1,141	7:30 am - 8:30 am
8:30 AM	8	5	2	0	12	0	22	5	27	799	7:45 am - 8:45 am
8:45 AM	8	2	3	2	7	2	18	6	24	181	8:00 am - 9:00 am
Peak Hour	537	374	156	84	86	32	779	490	1,269	Peak Hour is 7:15 am - 8:15 am	
	911		240		118		1,269				

Lake Washington High School Trip Generation Study
AM Peak Hour
Day: Thursday, September 20, 2018

Interval	#1 NE 80th St/120th Ave NE (Main Access)		#2 NE 75th Street / West Driveway		#3 NE 75th Street / East Driveway		Total Trips			Hourly Totals	
Begin	In	Out	In	Out	In	Out	In	Out	Total		
7:00 AM	34	10	7	0	14	2	55	12	67		
7:15 AM	79	35	16	4	9	4	104	43	147		
7:30 AM	189	96	34	16	27	8	250	120	370		
7:45 AM	247	191	96	56	63	26	406	273	679	1,263	7:00 am - 8:00 am
8:00 AM	23	53	3	7	2	4	28	64	92	1,288	7:15 am - 8:15 am
8:15 AM	6	4	0	0	2	2	8	6	14	1,155	7:30 am - 8:30 am
8:30 AM	5	5	0	0	1	0	6	5	11	796	7:45 am - 8:45 am
8:45 AM	7	4	1	1	1	0	9	5	14	131	8:00 am - 9:00 am
Peak Hour	538	375	149	83	101	42	788	500	1,288	Peak Hour is 7:15 am - 8:15 am	
	913		232		143		1,288				

Lake Washington High School Trip Generation Study
AM Peak Hour
Day: Tuesday, September 18, 2018

Interval	#1 NE 80th St/120th Ave NE (Main Access)		#2 NE 75th Street / West Driveway		#3 NE 75th Street / East Driveway		Total Trips			Hourly Totals	
Begin	In	Out	In	Out	In	Out	In	Out	Total		
2:15 PM	17	9	3	2	4	0	24	11	35		
2:30 PM	66	7	5	8	7	3	78	18	96		
2:45 PM	61	76	10	81	18	16	89	173	262		
3:00 PM	41	119	5	66	9	15	55	200	255	648	2:15 pm - 3:15 pm
3:15 PM	32	62	3	9	7	5	42	76	118	731	2:30 pm - 3:30 pm
3:30 PM	34	59	6	19	6	4	46	82	128	763	2:45 pm - 3:45 pm
Peak Hour	168	316	24	175	40	40	232	531	763	Peak Hour is 2:45 pm - 3:45 pm	
	484		199		80		763				

Lake Washington High School Trip Generation Study
AM Peak Hour
Day: Thursday, September 20, 2018

Interval	#1 NE 80th St/120th Ave NE (Main Access)		#2 NE 75th Street / West Driveway		#3 NE 75th Street / East Driveway		Total Trips			Hourly Totals	
Begin	In	Out	In	Out	In	Out	In	Out	Total		
2:15 PM	24	16	0	5	4	0	28	21	49		
2:30 PM	56	17	7	6	13	1	76	24	100		
2:45 PM	66	88	9	93	19	8	94	189	283		
3:00 PM	50	122	3	63	9	5	62	190	252	684	2:15 pm - 3:15 pm
3:15 PM	22	44	3	15	5	2	30	61	91	726	2:30 pm - 3:30 pm
3:30 PM	17	40	1	12	5	2	23	54	77	703	2:45 pm - 3:45 pm
Peak Hour	194	271	22	177	46	16	262	464	726	Peak Hour is 2:30 pm - 3:30 pm	
	465		199		62		726				

Lake Washington High School Trip Generation Study
PM Peak Hour
Day: Tuesday, September 18, 2018

Interval	#1 NE 80th St/120th Ave NE (Main Access)		#2 NE 75th Street / West Driveway		#3 NE 75th Street / East Driveway		Total Trips			Hourly Totals	
Begin	In	Out	In	Out	In	Out	In	Out	Total		
4:00 PM	15	29	2	8	3	4	20	41	61		
4:15 PM	16	13	0	3	7	4	23	20	43		
4:30 PM	19	15	5	5	2	9	26	29	55		
4:45 PM	17	22	0	8	8	7	25	37	62	221	4:00 pm - 5:00 pm
5:00 PM	13	22	3	5	5	8	21	35	56	216	4:15 pm - 5:15 pm
5:15 PM	13	11	3	4	6	1	22	16	38	211	4:30 pm - 5:30 pm
5:30 PM	19	17	4	3	7	4	30	24	54	210	4:45 pm - 5:45 pm
5:45 PM	28	10	4	2	3	1	35	13	48	196	5:00 pm - 6:00 pm
Peak Hour	67	79	7	24	20	24	94	127	221	Peak Hour is 4:00 pm - 5:00 pm	
	146		31		44		221				

Lake Washington High School Trip Generation Study
PM Peak Hour
Day: Thursday, September 20, 2018

Interval	#1 NE 80th St/120th Ave NE (Main Access)		#2 NE 75th Street / West Driveway		#3 NE 75th Street / East Driveway		Total Trips			Hourly Totals	
Begin	In	Out	In	Out	In	Out	In	Out	Total		
4:00 PM	19	20	2	6	6	0	27	26	53		
4:15 PM	12	15	0	9	6	2	18	26	44		
4:30 PM	26	21	2	4	10	4	38	29	67		
4:45 PM	18	29	0	10	6	3	24	42	66	230	4:00 pm - 5:00 pm
5:00 PM	21	26	1	1	5	5	27	32	59	236	4:15 pm - 5:15 pm
5:15 PM	23	14	5	6	6	5	34	25	59	251	4:30 pm - 5:30 pm
5:30 PM	20	20	1	2	4	6	25	28	53	237	4:45 pm - 5:45 pm
5:45 PM	15	13	6	1	8	4	29	18	47	218	5:00 pm - 6:00 pm
Peak Hour	88	90	8	21	27	17	123	128	251	Peak Hour is 4:30 pm - 5:30 pm	
	178		29		44		251				

Appendix D

Detailed Trip Generation Estimate

Lake Washington High School
TENW Project No. 5786

Lake Washington High School Addition
Trip Generation Estimate

Time Period	Additional Enrollment [1]	Trip Rate [2,3]	Directional Distribution [2]		Vehicular Trip Generation		
			Entering	Exiting	In	Out	Total
Daily	273	2.93	50%	50%	400	400	800
AM Peak Hour	273	0.83	61%	39%	138	89	227
Afternoon Peak Hour	273	0.48	33%	67%	43	88	131
PM Peak Hour	273	0.15	46%	54%	19	22	41

Notes:

1. Additional enrollment capacity provided by LWSD on 10/1/18.
2. Trip rates and directional splits based on trip generation study at LWHS conducted September 18 and September 20, 2018.
3. Daily trip rate based on ITE Trip Generation Manual, 10th Edition based on the ratio of daily trip rates to peak hour trip rates for LUC 530.

Appendix E

Concurrency Test Notice

CITY OF KIRKLAND
Department of Public Works
123 Fifth Avenue, Kirkland, WA 98033 425.587.3800
www.kirklandwa.gov

MEMORANDUM

To: Tony Leavitt, Senior Planner

From: Thang Nguyen, Transportation Engineer

Date: November 1, 2018

Subject: Lake Washington High School Expansion Traffic Concurrency Test Notice, Tran18-00674

The purpose of this memo is to inform you that the proposed Lake Washington High School expansion project has passed traffic concurrency. This concurrency test notice allows the applicant to proceed with their development permits.

Project Description

The applicant proposed to expand the school building to add 20 new classrooms and remove the existing portables that are located in the parking area. The expansion would increase the school student enrollment by 273 additional students for a total of 2,000 students. The project access will remain the same.

Trip Generation

Based on ITE Trip Generation rates, the expansion will generate a net new of approximately 800 daily, 227 AM, 41 PM peak hour trips and 40 PM peak hour person trips. The project is anticipated to be completed by 2018. The project build out and full occupancy is anticipated to be by 2020.

This memo will serve as the concurrency test notice for the proposed project. Per *Section 25.10.020 Procedures* of the KMC (Kirkland Municipal Code), this Concurrency Test Notice will expire in one year (November 1, 2019) unless a development permit and certificate of concurrency are issued or an extension is granted.

EXPIRATION

The concurrency test notice shall expire and a new concurrency test application is required unless:

1. A complete SEPA checklist, traffic impact analysis (TIA) and all required documentation are submitted to the City within 90 calendar days of the concurrency test notice (January 30, 2019).

2. A Certificate of Concurrency is issued or an extension is requested and granted by the Public Works Department within one year of issuance of the concurrency test notice. (A Certificate of Concurrency is issued at the same time a development

permit or building permit is issued if the applicant holds a valid concurrency test notice.)

3. A Certificate of Concurrency shall expire six years from the date of issuance of the concurrency test notice unless all building permits are issued for buildings approved under the concurrency test notice.

APPEALS

The concurrency test notice may be appealed by the public or agency with jurisdiction. The concurrency test notice is subject to an appeal until the SEPA review process is complete and the appeal deadline has passed. Concurrency appeals are heard before the Hearing Examiner along with any applicable SEPA appeal. For more information, refer to the Kirkland Municipal Code, Title 25. If you have any questions, please call me at x3869.

cc: Energov Tran18-00661

Appendix F

Daily Trip Assignment Tables

LWHS Addition
PM and Daily Trip Assignment

	PM Peak Hour Trip Generation		Daily Trip Generation	
New Trips	19 IN	22 OUT	400 IN	400 OUT

Code	Study Int	Intersection	Turning Volumes											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
403		*NE 85th St / 120th Ave NE*	major						minor					
		PM Peak Hour Trips =			5	1			6		1			
		Estimated Daily Trips =			100	20			100		20			
405		*120th Ave NE / NE 80th St*	major						minor					
		PM Peak Hour Trips =			2	6			2	7	7		6	
		Estimated Daily Trips =			40	120			40	120	120		120	
407		*NE 70th St / 116th Ave NE*	minor						major					
		PM Peak Hour Trips =	1							4			3	2
		Estimated Daily Trips =	20							80			60	40
409		*NE 85th St / 122nd Ave NE*	major						minor					
		PM Peak Hour Trips =		1		2	1				2			
		Estimated Daily Trips =		20		40	20				40			
-		*NE 75th St / 116th Ave NE*	minor						major					
		PM Peak Hour Trips =				3				2	3		2	
		Estimated Daily Trips =				60				40	60		40	
-		*NE 75th St / 122nd Ave NE*	minor						major					
		PM Peak Hour Trips =			3				3					
		Estimated Daily Trips =			60				60					
-		*NE 80th St / 122nd Ave NE (north)*	major						minor					
		PM Peak Hour Trips =	2	4			4							2
		Estimated Daily Trips =	40	80			80							40
-		*NE 80th St / 122nd Ave NE (south)*	major						minor					
		PM Peak Hour Trips =		4			4							
		Estimated Daily Trips =		80			80							
-		*NE 70th St / 122nd Ave NE*	major						minor					
		PM Peak Hour Trips =						3				3		
		Estimated Daily Trips =						60				60		

LWHS Addition
Distribution based on existing volumes

Code	Intersection	Trip Distribution											
		Eastbound			Westbound			Northbound			Southbound		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
403	*NE 85th St / 120th Ave NE*	major						minor					
				25%	5%			25%		5%			
405	*120th Ave NE / NE 80th St*	major						minor					
				10%	30%			10%	30%	30%		30%	
407	*NE 70th St / 116th Ave NE*	minor						major					
		5%							20%			15%	10%
409	*NE 85th St / 122nd Ave NE*	major						minor					
			5%		10%	5%				10%			
-	*NE 75th St / 116th Ave NE*	minor						major					
					15%				10%	15%		10%	
-	*NE 75th St / 122nd Ave NE*	minor						major					
				15%				15%					
-	*NE 80th St / 122nd Ave NE (north)*	minor						major					
		10%	20%			20%							10%
-	*NE 80th St / 122nd Ave NE (south)*	minor						major					
			20%			20%							
-	*NE 70th St / 122nd Ave NE*	minor						major					
							15%				15%		

Appendix G

Proportional Share Calculations

[1] See "*Intersection Description*" worksheet for descriptions

Input appropriate information in green cells

			Through Lanes[1]
Project Name:	LWHS Addition		
Intersection No.	403		
Major Street[1]	NE 85th St	# of Lanes*=	2
Minor Street[1]	120th Ave NE	# of Lanes*=	1

1. May Change without notice, call Thang Nguyen 425-587-3869 with questions

DATE:
10/1/2018

Daily Project Traffic Entering the Intersection

		Daily Volumes	*Entering Leg Volumes**		
(Total of both approaches divided by two)	Major Street Volume V_1 =	60	100	20	*Major*
(Total of both approaches divided by two)	Minor Street Volume V_2 =	60	120	0	*Minor*

***Do not leave cell empty for zero volume**

Determine Geometric Factors

Number of Lanes		Geometric Factors			
Major Street	Minor Street	f_1	f_2	f_3	f_4
2	2	1.000	1.330	1.000	1.330
2	1	1.000	1.000	1.000	1.000
1	2	0.833	1.330	0.833	1.330
1	1	0.833	1.000	0.833	1.000

f_1	f_2	f_3	f_4
1	***1***	***1***	***1***

Calculate Base Percentages

$P_1=V_1/(10{,}000 \times f_1)$ =	0.60%
$P_2=V_2/(5{,}000 \times f_2)$ =	1.20%
$P_3=V_1/(15{,}000 \times f_3)$ =	0.40%
$P_4=V_2/(2{,}500 \times f_4)$ =	2.40%

Calculate Proportional Share

$S_1=(P_1+P_2)/2$=	0.90%
$S_2=(P_3+P_4)/2$=	1.40%

Intersection Proportional Share = Maximum of S1 and S2 = 1.40%

Significant Intersection? **yes**

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By: SJH
Company: TENW

[1] See "*Intersection Description*" worksheet for descriptions

Input appropriate information in green cells

			Through Lanes[1]
Project Name:	LWHS Addition		
Intersection No.	405		
Major Street[1]	NE 80th St	# of Lanes*=	1
Minor Street[1]	120th Ave NE	# of Lanes*=	1

1. May Change without notice, call Thang Nguyen 425-587-3869 with questions

DATE:

10/1/2018

Daily Project Traffic Entering the Intersection

		Daily Volumes	*Entering Leg Volumes**		
(Total of both approaches divided by two)	Major Street Volume V_1 =	80	40	120	*Major*
(Total of both approaches divided by two)	Minor Street Volume V_2 =	200	280	120	*Minor*

***Do not leave cell empty for zero volume**

Determine Geometric Factors

Number of Lanes		Geometric Factors			
Major Street	Minor Street	f_1	f_2	f_3	f_4
2	2	1.000	1.330	1.000	1.330
2	1	1.000	1.000	1.000	1.000
1	2	0.833	1.330	0.833	1.330
1	1	0.833	1.000	0.833	1.000

f_1	f_2	f_3	f_4
0.833	***1***	***0.833***	***1***

Calculate Base Percentages

$P_1=V_1/(10{,}000 \times f_1)$ =	0.96%
$P_2=V_2/(5{,}000 \times f_2)$ =	4.00%
$P_3=V_1/(15{,}000 \times f_3)$ =	0.64%
$P_4=V_2/(2{,}500 \times f_4)$ =	8.00%

Calculate Proportional Share

$S_1=(P_1+P_2)/2$=	2.48%
$S_2=(P_3+P_4)/2$=	4.32%

Intersection Proportional Share = Maximum of S1 and S2 = 4.32%

Significant Intersection? **yes**

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By: SJH
Company: TENW

[1] See "*Intersection Description*" worksheet for descriptions

1. May Change without notice, call Thang Nguyen 425-587-3869 with questions

Input appropriate information in green cells

			Through Lanes[1]
Project Name:	LWHS Addition		
Intersection No.	407		
Major Street[1]	116th Ave NE	# of Lanes*=	1
Minor Street[1]	NE 70th Street	# of Lanes*=	1

DATE:

10/1/2018

Daily Project Traffic Entering the Intersection

		Daily Volumes	*Entering Leg Volumes**		
(Total of both approaches divided by two)	Major Street Volume V_1 =	90	80	100	***Major***
(Total of both approaches divided by two)	Minor Street Volume V_2 =	10	20	0	***Minor***

***Do not leave cell empty for zero volume**

Determine Geometric Factors

Number of Lanes		Geometric Factors			
Major Street	Minor Street	f_1	f_2	f_3	f_4
2	2	1.000	1.330	1.000	1.330
2	1	1.000	1.000	1.000	1.000
1	2	0.833	1.330	0.833	1.330
1	1	0.833	1.000	0.833	1.000

f_1	f_2	f_3	f_4
0.833	***1***	***0.833***	***1***

Calculate Base Percentages

$P_1=V_1/(10{,}000 \times f_1)$ =	1.08%
$P_2=V_2/(5{,}000 \times f_2)$ =	0.20%
$P_3=V_1/(15{,}000 \times f_3)$ =	0.72%
$P_4=V_2/(2{,}500 \times f_4)$ =	0.40%

Calculate Proportional Share

$S_1=(P_1+P_2)/2$=	0.64%
$S_2=(P_3+P_4)/2$=	0.56%

Intersection Proportional Share = Maximum of S1 and S2 = 0.64%

Significant Intersection? **no**

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By: SJH
Company: TENW

[1] See "*Intersection Description*" worksheet for descriptions

Input appropriate information in green cells

			Through Lanes[1]
Project Name:	LWHS Addition		
Intersection No.	409		
Major Street[1]	NE 85th St	# of Lanes*=	2
Minor Street[1]	122nd Ave NE	# of Lanes*=	1

1. May Change without notice, call Thang Nguyen 425-587-3869 with questions

DATE:
10/1/2018

Daily Project Traffic Entering the Intersection

		Daily Volumes	*Entering Leg Volumes**		
(Total of both approaches divided by two)	Major Street Volume V_1 =	40	20	60	*Major*
(Total of both approaches divided by two)	Minor Street Volume V_2 =	20	40	0	*Minor*

***Do not leave cell empty for zero volume**

Determine Geometric Factors

Number of Lanes		Geometric Factors			
Major Street	Minor Street	f_1	f_2	f_3	f_4
2	2	1.000	1.330	1.000	1.330
2	1	1.000	1.000	1.000	1.000
1	2	0.833	1.330	0.833	1.330
1	1	0.833	1.000	0.833	1.000

f_1	f_2	f_3	f_4
1	***1***	***1***	***1***

Calculate Base Percentages

$P_1=V_1/(10{,}000 \times f_1)$ =	0.40%
$P_2=V_2/(5{,}000 \times f_2)$ =	0.40%
$P_3=V_1/(15{,}000 \times f_3)$ =	0.27%
$P_4=V_2/(2{,}500 \times f_4)$ =	0.80%

Calculate Proportional Share

$S_1=(P_1+P_2)/2$=	0.40%
$S_2=(P_3+P_4)/2$=	0.53%

Intersection Proportional Share = Maximum of S1 and S2 = 0.53%

Significant Intersection? **no**

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By: SJH
Company: TENW

[1] See "*Intersection Description*" worksheet for descriptions

1. May Change without notice, call Thang Nguyen 425-587-3869 with questions

Input appropriate information in green cells

			Through Lanes[1]
Project Name:	LWHS Addition		
Intersection No.			
Major Street[1]	116th Ave NE	# of Lanes*=	1
Minor Street[1]	NE 75th St	# of Lanes*=	1

DATE:

10/1/2018

Daily Project Traffic Entering the Intersection

		Daily Volumes	*Entering Leg Volumes**		
(Total of both approaches divided by two)	Major Street Volume V_1 =	70	100	40	***Major***
(Total of both approaches divided by two)	Minor Street Volume V_2 =	30	0	60	***Minor***

***Do not leave cell empty for zero volume**

Determine Geometric Factors

Number of Lanes		Geometric Factors			
Major Street	Minor Street	f_1	f_2	f_3	f_4
2	2	1.000	1.330	1.000	1.330
2	1	1.000	1.000	1.000	1.000
1	2	0.833	1.330	0.833	1.330
1	1	0.833	1.000	0.833	1.000

f_1	f_2	f_3	f_4
0.833	***1***	***0.833***	***1***

Calculate Base Percentages

$P_1=V_1/(10{,}000 \times f_1)$ =	0.84%
$P_2=V_2/(5{,}000 \times f_2)$ =	0.60%
$P_3=V_1/(15{,}000 \times f_3)$ =	0.56%
$P_4=V_2/(2{,}500 \times f_4)$ =	1.20%

Calculate Proportional Share

$S_1=(P_1+P_2)/2$=	0.72%
$S_2=(P_3+P_4)/2$=	0.88%

Intersection Proportional Share = Maximum of S1 and S2 = 0.88%

Significant Intersection? **no**

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By:	SJH
Company:	TENW

[1] See "*Intersection Description*" worksheet for descriptions

1. May Change without notice, call Thang Nguyen 425-587-3869 with questions

Input appropriate information in green cells

			Through Lanes[1]
Project Name:	LWHS Addition		
Intersection No.			
Major Street[1]	122nd Ave NE	# of Lanes*=	1
Minor Street[1]	NE 75th St	# of Lanes*=	1

DATE:

10/1/2018

Daily Project Traffic Entering the Intersection

		Daily Volumes	*Entering Leg Volumes**		
(Total of both approaches divided by two)	Major Street Volume V_1 =	30	60	0	***Major***
(Total of both approaches divided by two)	Minor Street Volume V_2 =	30	60	0	***Minor***

***Do not leave cell empty for zero volume**

Determine Geometric Factors

Number of Lanes		Geometric Factors			
Major Street	Minor Street	f_1	f_2	f_3	f_4
2	2	1.000	1.330	1.000	1.330
2	1	1.000	1.000	1.000	1.000
1	2	0.833	1.330	0.833	1.330
1	1	0.833	1.000	0.833	1.000

f_1	f_2	f_3	f_4
0.833	***1***	***0.833***	***1***

Calculate Base Percentages

$P_1=V_1/(10{,}000 \times f_1)$ =	0.36%
$P_2=V_2/(5{,}000 \times f_2)$ =	0.60%
$P_3=V_1/(15{,}000 \times f_3)$ =	0.24%
$P_4=V_2/(2{,}500 \times f_4)$ =	1.20%

Calculate Proportional Share

$S_1=(P_1+P_2)/2$=	0.48%
$S_2=(P_3+P_4)/2$=	0.72%

Intersection Proportional Share = Maximum of S1 and S2 = 0.72%

Significant Intersection? **no**

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By: SJH
Company: TENW

[1] See "*Intersection Description*" worksheet for descriptions

Input appropriate information in green cells

			Through Lanes[1]
Project Name:	LWHS Addition		
Intersection No.			
Major Street[1]	NE 80th St	# of Lanes*=	1
Minor Street[1]	122nd Ave NE (north)	# of Lanes*=	1

1. May Change without notice, call Thang Nguyen 425-587-3869 with questions

DATE:

10/1/2018

Daily Project Traffic Entering the Intersection

		Daily Volumes	*Entering Leg Volumes**		
(Total of both approaches divided by two)	Major Street Volume V_1 =	100	120	80	*Major*
(Total of both approaches divided by two)	Minor Street Volume V_2 =	20	0	40	*Minor*

***Do not leave cell empty for zero volume**

Determine Geometric Factors

Number of Lanes		Geometric Factors			
Major Street	Minor Street	f_1	f_2	f_3	f_4
2	2	1.000	1.330	1.000	1.330
2	1	1.000	1.000	1.000	1.000
1	2	0.833	1.330	0.833	1.330
1	1	0.833	1.000	0.833	1.000

f_1	f_2	f_3	f_4
0.833	***1***	***0.833***	***1***

Calculate Base Percentages

$P_1=V_1/(10{,}000 \times f_1)$ =	1.20%
$P_2=V_2/(5{,}000 \times f_2)$ =	0.40%
$P_3=V_1/(15{,}000 \times f_3)$ =	0.80%
$P_4=V_2/(2{,}500 \times f_4)$ =	0.80%

Calculate Proportional Share

$S_1=(P_1+P_2)/2$=	0.80%
$S_2=(P_3+P_4)/2$=	0.80%

Intersection Proportional Share = Maximum of S1 and S2 = 0.80%

Significant Intersection? **no**

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By: SJH
Company: TENW

[1] See "*Intersection Description*" worksheet for descriptions

1. May Change without notice, call Thang Nguyen 425-587-3869 with questions

Input appropriate information in green cells

			Through Lanes[1]
Project Name:	LWHS Addition		
Intersection No.			
Major Street[1]	NE 80th St	# of Lanes*=	1
Minor Street[1]	122nd Ave NE (south)	# of Lanes*=	1

DATE:
10/1/2018

Daily Project Traffic Entering the Intersection

		Daily Volumes	*Entering Leg Volumes**		
(Total of both approaches divided by two)	Major Street Volume V_1 =	80	80	80	***Major***
(Total of both approaches divided by two)	Minor Street Volume V_2 =	0	0	0	***Minor***

***Do not leave cell empty for zero volume**

Determine Geometric Factors

Number of Lanes		Geometric Factors			
Major Street	Minor Street	f_1	f_2	f_3	f_4
2	2	1.000	1.330	1.000	1.330
2	1	1.000	1.000	1.000	1.000
1	2	0.833	1.330	0.833	1.330
1	1	0.833	1.000	0.833	1.000

f_1	f_2	f_3	f_4
0.833	***1***	***0.833***	***1***

Calculate Base Percentages

$P_1=V_1/(10{,}000 \times f_1)$ =	0.96%
$P_2=V_2/(5{,}000 \times f_2)$ =	0.00%
$P_3=V_1/(15{,}000 \times f_3)$ =	0.64%
$P_4=V_2/(2{,}500 \times f_4)$ =	0.00%

Calculate Proportional Share

$S_1=(P_1+P_2)/2$=	0.48%
$S_2=(P_3+P_4)/2$=	0.32%

Intersection Proportional Share = Maximum of S1 and S2 = 0.48%

Significant Intersection? **no**

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By: SJH
Company: TENW

[1] See "*Intersection Description*" worksheet for descriptions

1. May Change without notice, call Thang Nguyen 425-587-3869 with questions

Input appropriate information in green cells

			Through Lanes[1]
Project Name:	LWHS Addition		
Intersection No.			
Major Street[1]	NE 70th St	# of Lanes*=	1
Minor Street[1]	122nd Ave NE	# of Lanes*=	1

DATE:

10/1/2018

Daily Project Traffic Entering the Intersection

		Daily Volumes	*Entering Leg Volumes**		
(Total of both approaches divided by two)	Major Street Volume V_1 =	30	0	60	***Major***
(Total of both approaches divided by two)	Minor Street Volume V_2 =	30	0	60	***Minor***

***Do not leave cell empty for zero volume**

Determine Geometric Factors

Number of Lanes		Geometric Factors			
Major Street	Minor Street	f_1	f_2	f_3	f_4
2	2	1.000	1.330	1.000	1.330
2	1	1.000	1.000	1.000	1.000
1	2	0.833	1.330	0.833	1.330
1	1	0.833	1.000	0.833	1.000

f_1	f_2	f_3	f_4
0.833	***1***	***0.833***	***1***

Calculate Base Percentages

$P_1=V_1/(10{,}000 \times f_1)$ =	0.36%
$P_2=V_2/(5{,}000 \times f_2)$ =	0.60%
$P_3=V_1/(15{,}000 \times f_3)$ =	0.24%
$P_4=V_2/(2{,}500 \times f_4)$ =	1.20%

Calculate Proportional Share

$S_1=(P_1+P_2)/2$=	0.48%
$S_2=(P_3+P_4)/2$=	0.72%

Intersection Proportional Share = Maximum of S1 and S2 = 0.72%

Significant Intersection? **no**

1. Number of through lanes. Do not count exclusive turn lanes. Use the smaller number of lanes if the number of lanes is unequal on two legs. For Example, if one minor leg has two lanes and one minor leg has one lane, the number of lanes on the minor leg is one.

Computed By: SJH
Company: TENW

Appendix H

Existing Weekday Parking Demand Study

Lake Washington High School Parking Data Summary
TENW Project No. 5786

EXISTING WEEKDAY PARKING DEMAND SUMMARY	
	Total Parking Demand
Day	**8:45 AM**
Tues 9/18/18	395
Thurs 9/20/18	419
2-day Average	**407**

EXISTING WEEKDAY PARKING RATES

	Occupied Parking Stalls	Number of Students	Peak Parking Rate (stalls/student)
2-day Average	407	1,541	0.26

FORECAST FUTURE PARKING DEMAND

	Peak Parking Rate (stalls/staff)	Number of Students	Estimated Parking Demand
2-day Average	0.26	2,000	520

Lake Washington High School Parking Data Summary
TENW Project No. 5786

Weekday Parking Demand

Type of Parking Stall	Number of Available Stalls	Number of Occupied Stalls Observed (8:45 AM) 9/18/2018 Number	9/18/2018 Percent	9/20/2018 Number	9/20/2018 Percent
Area #1 (Main Parking Lot)					
Student	320	257	80%	267	83%
Staff	63	63	100%	59	94%
Visitor	14	8	57%	9	64%
ADA	3	0	0%	1	33%
Reserved	6	2	33%	5	83%
Area #2 (East Parking Lot)					
Staff	58	35	60%	42	72%
ADA	11	1	9%	2	18%
Reserved	3	0	0%	0	0%
Area #3 (South Parking Lot)					
Staff	21	21	100%	24	114%
ADA	4	2	50%	2	50%
Reserved	5	4	80%	5	100%
Delivery	2	0	0%	1	50%
Theater Parking	0	2	-	2	-
LWHS ON-SITE TOTAL					
Student	320	257	80%	267	83%
Staff	142	119	84%	125	88%
Visitor	14	8	57%	9	64%
ADA	18	3	17%	5	28%
Reserved	14	6	43%	10	71%
Delivery	2	0	0%	1	50%
Theater Parking	0	2	-	2	-
ON-SITE TOTAL	**510**	**395**		**419**	
PERCENT OCCUPIED		**77%**		**82%**	

2-DAY AVERAGE TOTAL PARKING DEMAND	**407**
2-DAY AVERAGE PERCENT OCCUPIED	**80%**

CITY OF KIRKLAND
Department of Public Works
123 Fifth Avenue, Kirkland, WA 98033 425.587.3800
www.kirklandwa.gov

MEMORANDUM

To: **Christian Geitz, Planner**

From: **Thang Nguyen, Transportation Engineer**

Date: **April 1, 2019**

Subject: **Lake Washington High School Addition, Zon18-00783**

This memo summarizes my review of the traffic impact analysis (TIA) report dated December 2016, *Lake Washington High School Addition Traffic Impact Analysis* and the February 7, 2019 memorandum responding to the staff's comments submitted by TENW for the proposed expansion of the Lake Washington High School. My findings and recommendations are summarized below, followed by my review comments in response to the traffic impacts documented in the traffic report.

STAFF FINDINGS

The proposed project will not create significant SEPA related transportation impact to the adjacent neighborhood and streets.

The proposed 563 parking spaces will be adequate for the proposed school expansion.

STAFF RECOMMENDATIONS

SEPA Mitigation

Other than the Public Works conditions of approval described below, staff does not recommend any additional traffic mitigations as the proposed project will not create other significant off-site SEPA related traffic impacts.

Public Works Conditions

The following conditions of approval are required for the proposed development to mitigate citywide traffic impacts:

- Pay transportation impact fee.
- Provide a minimum of 530 parking spaces; at least 18 of those parking spaces shall be signed for visitors.
- Provide a parking management plan for staff approval. The plan shall list the mitigating measures that would be employed to mitigate overflow parking that would significantly impact the neighborhood. The plan shall be submitted and approved prior to final building permit.

Project Description
Currently, the school has 1,541 students and with the portables permit, it was approved to have a capacity of 1,727 students. The applicant proposed to remove the portables and construct an addition to the main building to accommodate 20 new classrooms. The expansion would increase the school student enrollment by 273 additional students for a total of 2,000 students. The project access will remain the same.

Trip Generation
Based on ITE Trip Generation rates, the expansion will generate a net new of approximately 800 daily, 227 AM, 131 new weekday afternoon peak hour trips and 41 PM peak hour trips. The project is anticipated to be completed by 2019. The project buildout and full occupancy are anticipated to be by 2020.

TRAFFIC CONCURRENCY
The proposed development project passed traffic concurrency. The concurrency test notice is valid until November 1, 2019 at which time the applicant must obtain a development permit and certificate of concurrency or apply for and receive an extension prior to the expiration of the concurrency test notice.

TRAFFIC IMPACT ANALYSIS
The scope of analysis was approved by the City Transportation Engineer and the traffic report was completed in accordance with the City of Kirkland TIA guidelines.

The citywide trip distribution was determined by using the Bellevue-Kirkland-Redmond (BKR) traffic model.

The City's Traffic Impact Analysis Guidelines (TIAG) requires a level of service (LOS) analysis using the Highway Capacity Manual Operational Method for intersections that have a proportionate share equal or greater than 1% as calculated using the method in the TIAG. Based on the proportionate share calculation for the full build-out of the proposed project, two off-site intersections met the 1% proportionate share threshold. The impacted intersection was analyzed for level of service, queuing and safety for both weekday AM and PM peak hours.

1. NE 80th Street/120th Avenue NE - Signalized
2. NE 85th Street/120th Avenue NE - Signalized

In addition to the intersections impacted by 1% or more, all intersections adjacent to the school campus were required to be analyzed for SEPA impacts. Those intersections include:

NE 80th Street/122nd Avenue NE
NE 75th Street/116th Avenue NE
NE 75th Street/120th Avenue NE

NE 75th Street/122nd Avenue NE

Traffic Mitigation Threshold For SEPA impacts
The City requires developers to mitigate traffic impacts when one of the following two conditions is met:

1. An intersection level of service is at E and the project has a proportional share of 15% or more at the intersection.
2. An intersection level of service is at F and the project has a proportional share of 5% or more at the intersection.

Off-site Traffic Impacts
Based on the level of service analyses documented in the TIA report, with the exception of the NE 80th Street/120th Avenue NE intersection, all other off-site intersections identified above are calculated to operate at LOS-D or better for the AM and PM peak hours and during the school's afternoon peak hour. As a result, no off-site mitigation is required for those intersections.

The intersection of NE 80th Street/120th Avenue NE is calculated to operate at LOS-F during the AM peak hour and LOS-B or better during the PM peak hour and the school's afternoon peak hour. The poor level of service will be experienced by the westbound left-turn school traffic entering the campus and the southbound left-turn traffic volumes that must yield to the large northbound through traffic volumes from the school. The project's additional traffic will impact the intersection by less than 5%, which is less than the warrant for LOS mitigation; therefore, the applicant is not required to mitigate the level of service. The City will monitor and adjust the traffic signal timing and phasing to accommodate the additional school traffic.

Driveway Operation
All project driveways are calculated to operate at an LOS-C or better for all three peak periods. None of the site driveways will have significant queues that would impede traffic flow.

Parking
Currently, the campus has 512 parking spaces. The parking along the west side of the campus will expand to include 50 additional spaces and approximately 69 of the parking spaces will be recovered from the removal of the portables. There will be some loss of parking (162 spaces) due during the construction phases, but overall the proposed addition would add another 51 parking spaces for a total of 563 spaces. Approximately 18 to 24 visitor parking spaces is being proposed at the completion of the project.

Based on parking counts, the parking demand for the current school is 0.26 parking spaces per student. It was assumed that the same rate would be required for the school expansion. The future parking demand is calculated to be 520 parking spaces. The proposed 563 parking spaces are adequate to accommodate the future demand.

The parking supply for the construction phases are summarized in Table 1. During Phase II there will be 488 parking spaces. It is not anticipated that there will be added enrollment during this school year; therefore, the parking demand during this phase with the current enrollment is calculated to be approximately 401 spaces.

Table 1. Parking Supply Phasing

Construction Phases	Time Periods	Existing	School in Session?	Remove	Add	Total	Demand
Existing		512	Yes	0	0	512	401
Phase I	June 2019 to Aug 2019	512	No	-118	0	394	100
Phase II	Sept 2019 to June 2020	394	Yes	0	+94	488	401
Phase III	July 2020 to Aug 2020	488	No	-42	+83	529	100
Phase IV	Sept 2020 to July 2021	529	Yes	0	0	529	401
Complete	August 2021	529	Yes	-2	+36	563	401 to 520

The school has over 100 events per year consisting of athletic events, community events/gatherings, performances and social events, etc. To staff's knowledge, the City have not had any complaints by the neighborhood about overflow parking during events. It is anticipated that the additional parking supply would adequately accommodate the increase parking demand during the events. However, the applicant shall provide a parking management plan that list the mitigating measures that would be employ to mitigate overflow parking that would significantly impact the neighborhood.

TRANSPORTATION IMPACT FEE

Per City's Ordinance 3685, Transportation Impact Fees is required for all developments and is calculated based on the most updated Transportation Impact Fee Schedule, January 1, 2019. Transportation impact fees are used to construct transportation capacity improvements throughout the City to help the City maintain transportation concurrency. Table 1 summarizes the road impact fee calculation for the proposed project. The final road impact fee will be determined at final building permit.

Table 1. Road Impact Fee

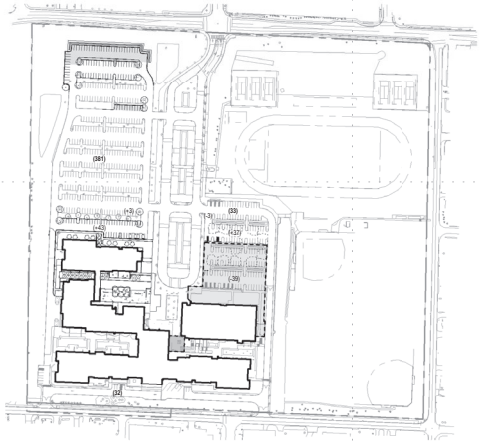
	Units	Impact Fee Rate	Impact Fee
Proposed			
Additional students	273	$311.25 per student	$84,971.25

cc: John Burkhalter, Development Engineer Manager
Philip Vartanian, Senior Development Engineer
Energov

PARKING					ACCESSIBLE (IBC T1106.1)					VAN ACCESSIBLE				
REQD	PROVIDED				REQD	PROVIDED				REQD	PROVIDED			
	EXIST	DELETE	ADD	TOTAL	2%	EXIST	DELETE	ADD	TOTAL	1:6	EXIST	DELETE	ADD	TOTAL
520	486	-2	+36	520	11	16	-4	+7	19	4	8	-2	+2	8
PARKING + FUTURE					ACCESSIBLE (IBC T1106.1)					VAN ACCESSIBLE				
REQD	PROVIDED				REQD	PROVIDED				REQD	PROVIDED			
	EXIST	DELETE	ADD	TOTAL	2%	EXIST	DELETE	ADD	TOTAL	1:6	EXIST	DELETE	ADD	TOTAL
520	529	-2	+36	563	12	16	-4	+7	19	4	8	-2	+2	8

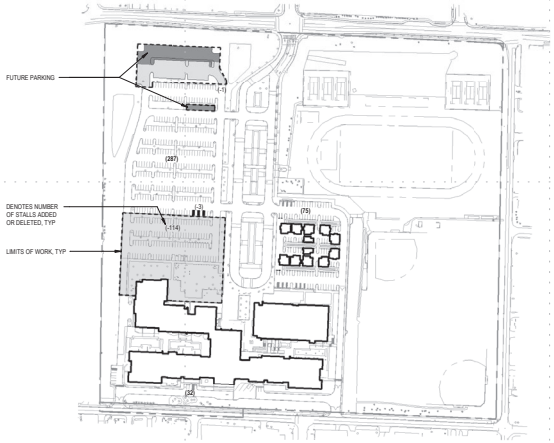
COMPLETE (NIC): AUG 2021 (6)
Scale: N.T.S.

PARKING					ACCESSIBLE (IBC T1106.1)					VAN ACCESSIBLE				
REQD	PROVIDED				REQD	PROVIDED				REQD	PROVIDED			
	EXIST	DELETE	ADD	TOTAL	2%	EXIST	DELETE	ADD	TOTAL	1:6	EXIST	DELETE	ADD	TOTAL
520	445	-42	+83	486	10	18	-10	+8	16	3	7	-3	+4	8
PARKING + FUTURE					ACCESSIBLE (IBC T1106.1)					VAN ACCESSIBLE				
REQD	PROVIDED				REQD	PROVIDED				REQD	PROVIDED			
	EXIST	DELETE	ADD	TOTAL	2%	EXIST	DELETE	ADD	TOTAL	1:6	EXIST	DELETE	ADD	TOTAL
520	488	-42	+83	529	11	18	-10	+8	16	3	7	-3	+4	8



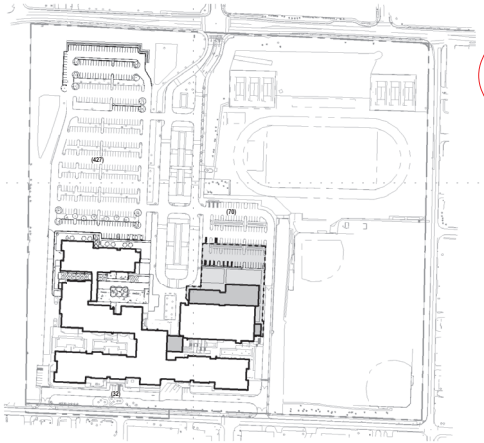
PH III (NIC): JULY 2020 - AUG 2021 (4)
Scale: N.T.S.

PARKING					ACCESSIBLE (IBC T1106.1)					VAN ACCESSIBLE				
REQD	PROVIDED				REQD	PROVIDED				REQD	PROVIDED			
	EXIST	DELETE	ADD	TOTAL	2%	EXIST	DELETE	ADD	TOTAL	1:6	EXIST	DELETE	ADD	TOTAL
520	512	-118	-	394	8	18	-3	+3	18	3	7	-1	+1	7



PH I: JUNE 2019 - AUG 2019 (2)
Scale: N.T.S.

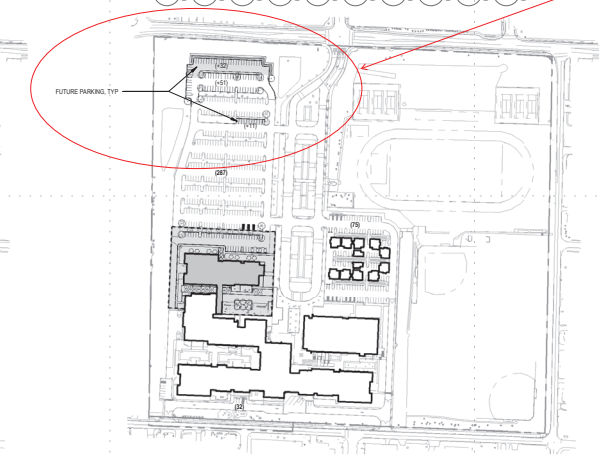
PARKING					ACCESSIBLE (IBC T1106.1)					VAN ACCESSIBLE				
REQD	PROVIDED				REQD	PROVIDED				REQD	PROVIDED			
	EXIST	DELETE	ADD	TOTAL	2%	EXIST	DELETE	ADD	TOTAL	1:6	EXIST	DELETE	ADD	TOTAL
520	486	-	-	486	10	16	-	-	16	3	8	-	-	8
PARKING + FUTURE					ACCESSIBLE (IBC T1106.1)					VAN ACCESSIBLE				
REQD	PROVIDED				REQD	PROVIDED				REQD	PROVIDED			
	EXIST	DELETE	ADD	TOTAL	2%	EXIST	DELETE	ADD	TOTAL	1:6	EXIST	DELETE	ADD	TOTAL
520	529	-	-	529	11	16	-	-	16	3	8	-	-	8



PH IV (NIC): SEPT 2020 - JULY 2021 (5)
Scale: N.T.S.

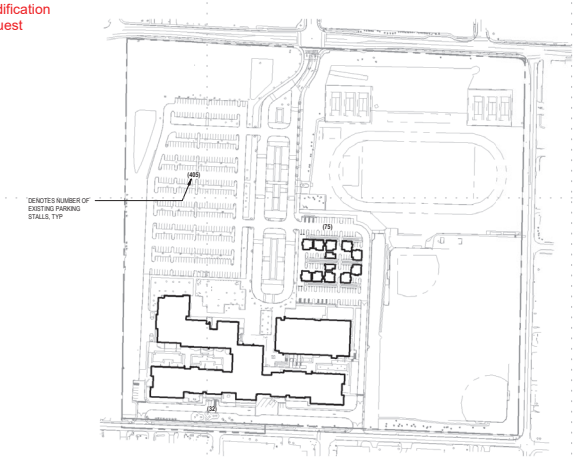
PARKING					ACCESSIBLE (IBC T1106.1)					VAN ACCESSIBLE				
REQD	PROVIDED				REQD	PROVIDED				REQD	PROVIDED			
	EXIST	DELETE	ADD	TOTAL	2%	EXIST	DELETE	ADD	TOTAL	1:6	EXIST	DELETE	ADD	TOTAL
520	394	-	+51	445	9	18	-	-	18	3	7	-	-	7
PARKING + FUTURE					ACCESSIBLE (IBC T1106.1)					VAN ACCESSIBLE				
REQD	PROVIDED				REQD	PROVIDED				REQD	PROVIDED			
	EXIST	DELETE	ADD	TOTAL	2%	EXIST	DELETE	ADD	TOTAL	1:6	EXIST	DELETE	ADD	TOTAL
520	394	-	+94	488	10	18	-	-	18	3	7	-	-	7

Parking lot expansion area related to the Minor Modification request



PH II (SEPT 2019 - JUNE 2020) (3)
Scale: N.T.S.

PARKING					ACCESSIBLE (IBC T1106.1)					VAN ACCESSIBLE				
REQD	PROVIDED				REQD	PROVIDED				REQD	PROVIDED			
	EXIST	DELETE	ADD	TOTAL	2%	EXIST	DELETE	ADD	TOTAL	1:6	EXIST	DELETE	ADD	TOTAL
520	512	-	-	512	11	18	-	-	18	3	7	-	-	7



EXISTING SITE PLAN (1)
Scale: N.T.S.

mcg-ARC

architect_
MCDRANAHAN ARCHITECTS

civil engineer_
JACOBSON CONSULTING ENGINEERS

landscape architect_
WEISMAN DESIGN GROUP

structural engineer_
PCS STRUCTURAL SOLUTIONS

mechanical engineer_
BCE ENGINEERS

7924 REGISTERED ARCHITECT
MATTHEW C. LANE
STATE OF WASHINGTON

project_
LAKE WASHINGTON HIGH SCHOOL ADDITION

client_
LAKE WASHINGTON SCHOOL DISTRICT No. 414

location_
KIRKLAND, WA

Project No. 1810.000

PARKING SEQUENCING DIAGRAMS

issued_

SCHEMATIC DESIGN	30 JULY 18
DESIGN DEVELOPMENT	02 NOV 18
PERMIT SET	25 JAN 19
BID SET	01 MAR 19

revision_

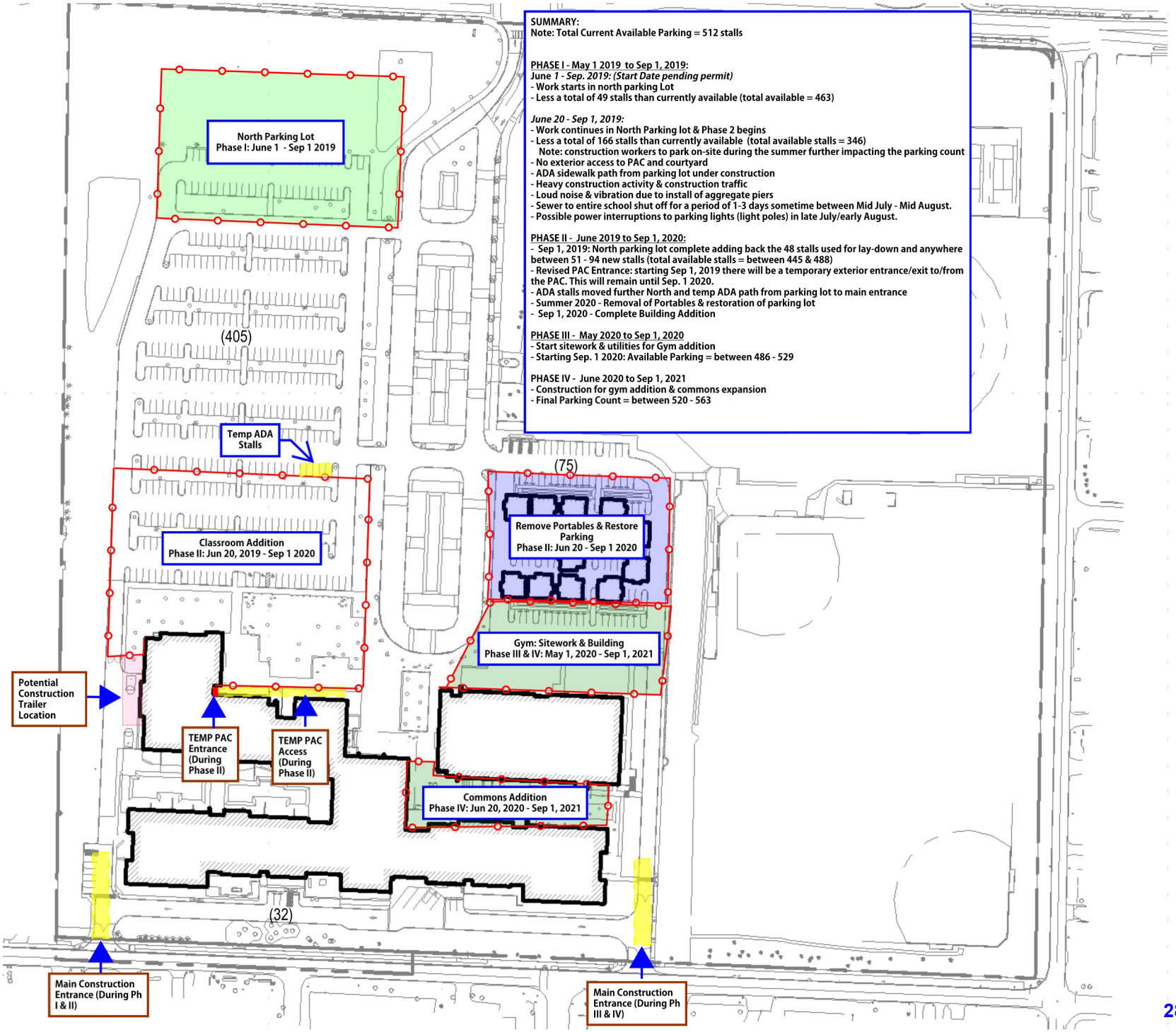
2 ADDENDUM 2	22 MAR 19
1 PERMIT RESUBMITTAL	TBD

drawn_
DKS

checked_
ML

sheet_
G0.02A

LWHS Addition - Construction Impact Plan



SUMMARY:
Note: Total Current Available Parking = 512 stalls

PHASE I - May 1 2019 to Sep 1, 2019:
June *1 - Sep. 2019: (Start Date pending permit)*
- Work starts in north parking Lot
- Less a total of 49 stalls than currently available (total available = 463)

June 20 - Sep 1, 2019:
- Work continues in North Parking lot & Phase 2 begins
- Less a total of 166 stalls than currently available (total available stalls = 346)
  Note: construction workers to park on-site during the summer further impacting the parking count
- No exterior access to PAC and courtyard
- ADA sidewalk path from parking lot under construction
- Heavy construction activity & construction traffic
- Loud noise & vibration due to install of aggregate piers
- Sewer to entire school shut off for a period of 1-3 days sometime between Mid July - Mid August.
- Possible power interruptions to parking lights (light poles) in late July/early August.

PHASE II - June 2019 to Sep 1, 2020:
- Sep 1, 2019: North parking lot complete adding back the 48 stalls used for lay-down and anywhere between 51 - 94 new stalls (total available stalls = between 445 & 488)
- Revised PAC Entrance: starting Sep 1, 2019 there will be a temporary exterior entrance/exit to/from the PAC. This will remain until Sep. 1 2020.
- ADA stalls moved further North and temp ADA path from parking lot to main entrance
- Summer 2020 - Removal of Portables & restoration of parking lot
- Sep 1, 2020 - Complete Building Addition

PHASE III - May 2020 to Sep 1, 2020
- Start sitework & utilities for Gym addition
- Starting Sep. 1 2020: Available Parking = between 486 - 529

PHASE IV - June 2020 to Sep 1, 2021
- Construction for gym addition & commons expansion
- Final Parking Count = between 520 - 563

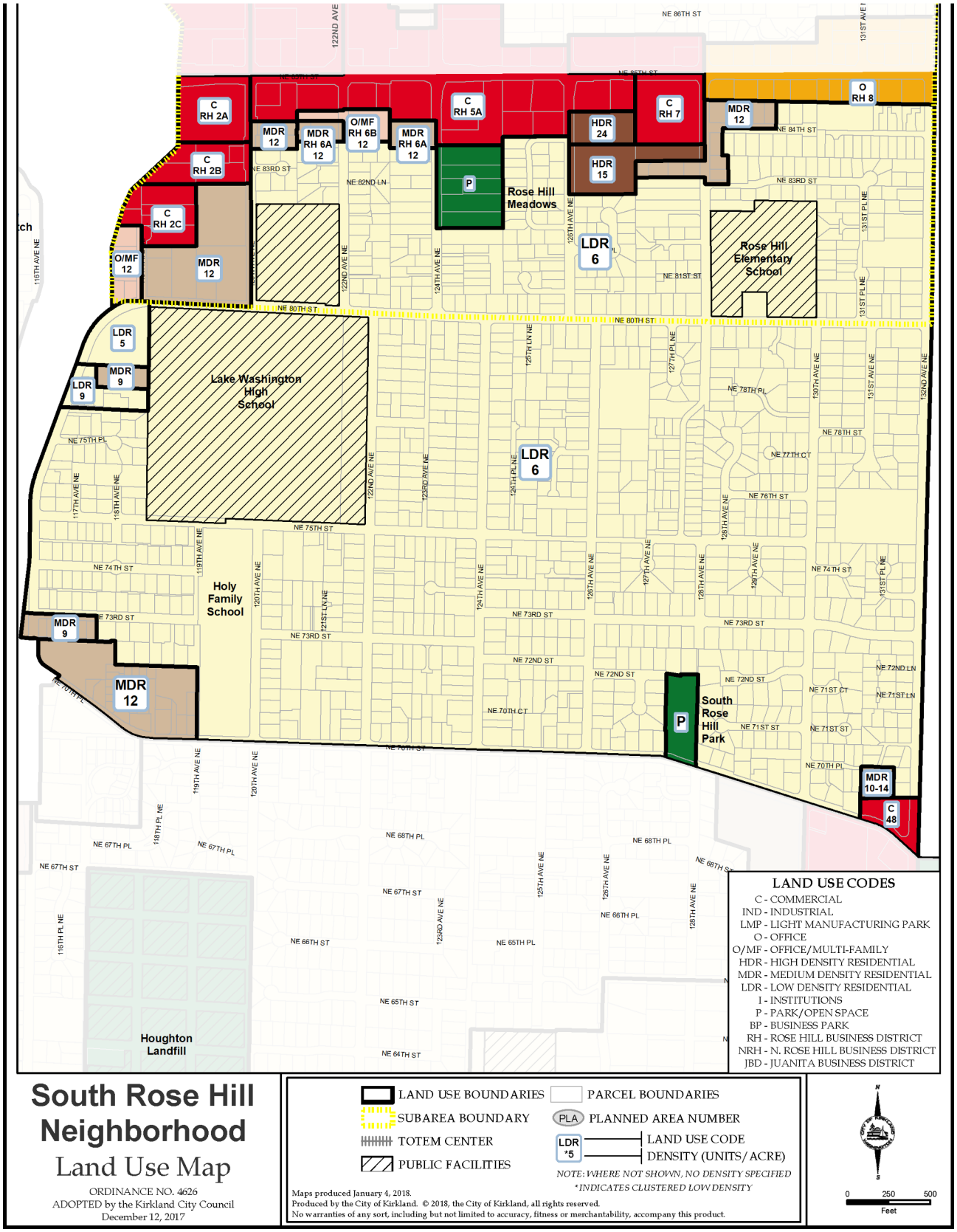


Figure SRH-3: South Rose Hill Land Use Map