

MEMORANDUM

DATE: September 21, 2018

TO: Robert Eichelsdoerfer
King County

FROM: Amy Wasserman / Curtis Chin, P.E.
TENW

SUBJECT: Level 1 Traffic Impact Analysis for
NE 18th Street Assemblage – King County, WA
TENW Project No. 5756



9/21/18

This Level 1 Traffic Impact Analysis (TIA) was prepared for the proposed NE 18th Street Assemblage project for the purpose of documenting traffic impacts. This memo includes a project description, trip generation estimate, trip distribution and assignment, Level of Service analysis, sight distance assessment, Safe Walk Route evaluation.

Project Description

The project site is located on the south side of NE 18th Street east of 244th Avenue NE in unincorporated King County as shown in the **Figure 1** site vicinity map. The project proposes 32 single-family detached residential dwelling units on a site that currently includes 3 single-family homes all of which would be removed with the proposed project. Vehicular access to the site would primarily be provided via NE 18th Street. Secondary vehicular access to the site would be provided to the south via the existing Woodhaven development. A preliminary site plan is included in **Figure 2**. Full project buildout is expected by 2021.

Study Area

The primary travel routes to and from the site include 244th Ave NE and NE 18th Street. The relationship of these roadways to the project site is shown in **Figure 1**. Descriptions of the streets are included in **Table 1**.

Table 1
Existing Roadway Network Summary – Project Site Vicinity

Roadway	Orientation	Classification	Speed Limit	Number of Travel Lanes	Street Parking	Sidewalks
244 th Ave NE	N-S	Minor Arterial	35	2	None	Both Sides south of 16 th
NE 18 th St	E-W	Urban Subcollector	25	2	None	None

N
NOT TO SCALE



Figure 2: Preliminary Site Plan



Collision History

Collision records at the study intersection of 244th Ave NE/NE 18th Street were reviewed for the most recent three-year period from 2015 to 2017. Based on collision data provided by WSDOT, there were no collisions at the intersection of 244th Ave NE/NE 18th Street during the most recent three-year period.

Project Trip Generation

The trip generation estimates for the proposed NE 18th Street Assemblage development (32 single-family lots) were based on methodology documented in the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10th edition for land use code (LUC) 210 (Single-Family Detached Housing). Consistent with guidelines included in the ITE *Trip Generation Handbook*, 3rd edition, fitted curve equations were used in the trip generation estimate for proposed land use and trip rates were used for existing single-family homes to be removed. **Table 2** summarizes the trip generation estimate for 29 net new single-family homes (32 proposed single-family homes less 3 existing single-family homes).

Table 2
NE 18th Street Assemblage – Trip Generation Summary

Time Period	Net New Trips Generated		
	In	Out	Total
Weekday Daily	168	168	336
Weekday AM Peak Hour	6	20	26
Weekday PM Peak Hour	19	12	31

As shown in **Table 2**, the proposed NE 18th Street Assemblage development is estimated to generate 336 net new weekday daily trips with 26 net new trips occurring during the weekday AM peak hour (6 in, 20 out) and 31 net new trips during the weekday PM peak hour (19 in, 12 out). Detailed trip generation calculations are included in **Attachment A**.

Project Trip Distribution and Assignment

Existing weekday AM and PM peak hour traffic volumes at the 244th Avenue NE/NE 18th Street intersection were based on counts conducted by All Traffic Data in August 2017. Existing count data is included in **Attachment B**.

The distribution of project generated vehicle trips by the NE 18th Street Assemblage project was based on existing travel patterns in the area and turning movement count data collected at the 244th Avenue NE/NE 18th Street intersection. The net new AM and PM peak hour project-generated trips were distributed to the vicinity street system as follows:

- 50 percent to/from north on 244th Avenue NE
- 50 percent to/from south on 244th Avenue NE

Figure 3 provides a graphical illustration of the assignment of the net new weekday AM and PM peak hour project-generated traffic to the study intersection.

Future Traffic Volumes

Future year 2021 No Action (without-project) peak hour traffic volumes were estimated by applying a 4 percent annual growth rate to the existing traffic volumes, consistent with other residential developments in the area. In addition to the background growth rate, trips from the following 5 pipeline projects were included in the future baseline traffic volumes:

1. Mystic Lake
2. Twins Ridge
3. Cedar Hill
4. 25th Street Assemblage
5. Kensington 19th Street Assemblage

The 2021 With-Project volumes were determined by adding the trip assignment from the proposed development to the future 2021 No Action traffic volumes. The 2018 existing traffic volumes, the net new project trip assignment, the 2021 No Action traffic volumes, and the 2021 With-Project traffic volumes at the study intersection of 244th Avenue NE/NE 18th Street are shown in **Figure 3**.

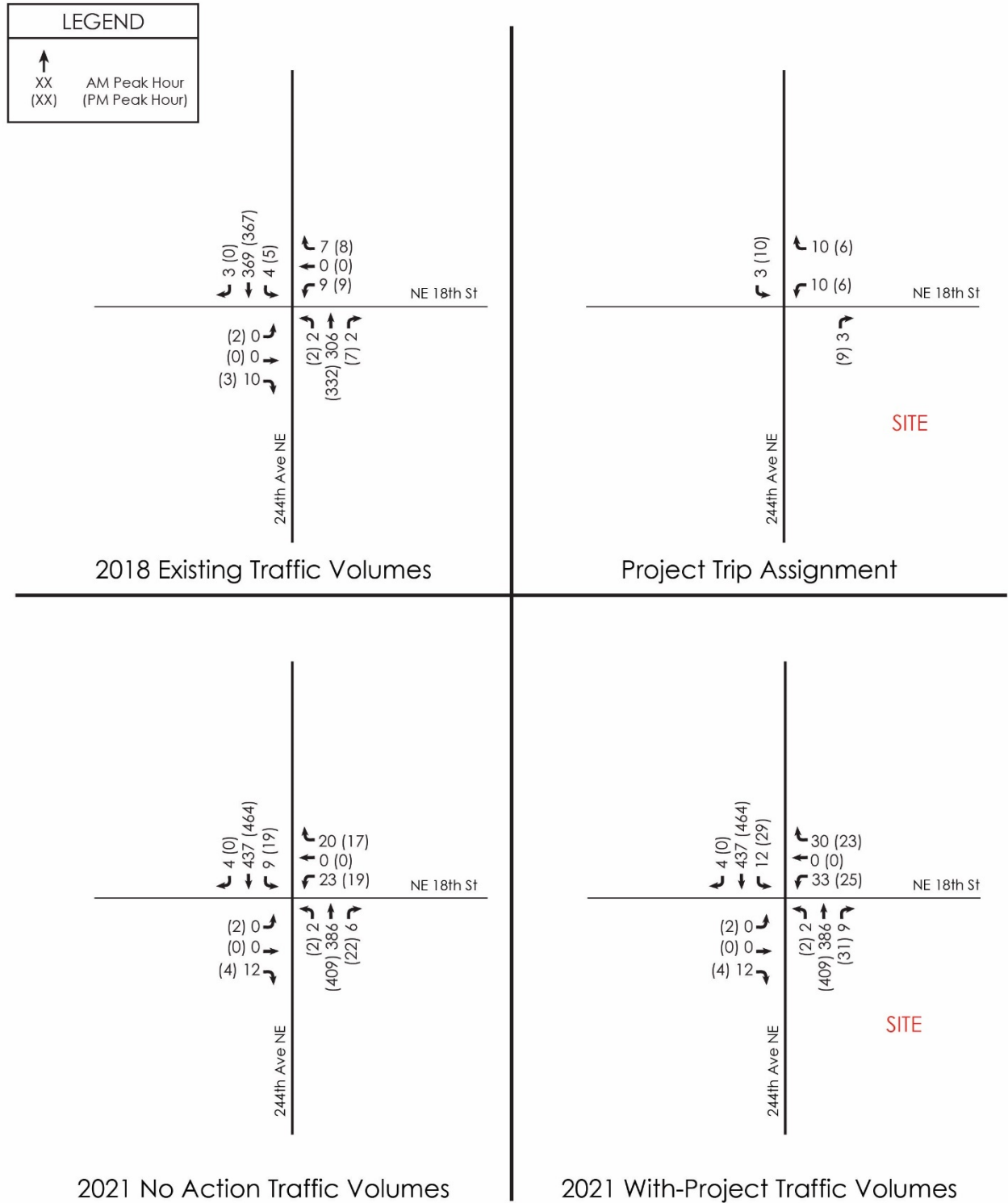


Figure 3: Peak Hour Traffic Volumes



Level of Service Analysis

Weekday AM and PM peak hour level of service (LOS) analyses at the 244th Avenue NE/NE 18th Street study intersection were conducted using the methodologies and procedures outlined in the latest edition of the *Highway Capacity Manual* (6th Edition). LOS serves as an indicator of the quality of traffic flow and degree of congestion at an intersection or roadway segment. It is a measure of vehicle operating speed, travel time, travel delays, and driving comfort. The LOS methodology is described in **Attachment C**. The *Synchro Version 10.3* software package was used to determine intersection LOS.

LOS analyses were conducted at the study intersection of 244th Avenue NE/NE 18th Street for 2018 existing AM and PM peak hour conditions and future year 2021 conditions without and with the proposed NE 18th Street Assemblage project. The LOS analysis results are summarized in **Table 3**. The detailed LOS worksheets are included in **Attachment D**.

Table 3
NE 18th Street Assemblage – Weekday Peak Hour LOS Summary

Study Intersection	2018 Existing		2021 No Action		2021 With Project	
	LOS ¹	Delay (sec) ²	LOS ¹	Delay (sec) ²	LOS ¹	Delay (sec) ²
<u>AM Peak Hour</u>						
244 th Avenue NE / NE 18 th Street						
Northbound Left-Turn	A	8.5	A	8.8	A	8.8
Southbound shared Left-Thru-Right	A	8.2	A	8.6	A	8.6
Eastbound shared Left-Thru-Right	B	11.8	B	12.8	B	12.8
Westbound shared Left-Thru-Right	C	17.4	D	25.7	D	29.8
<u>PM Peak Hour</u>						
244 th Avenue NE / NE 18 th Street						
Northbound Left-Turn	A	8.1	A	8.4	A	8.4
Southbound shared Left-Thru-Right	A	8.0	A	8.3	A	8.4
Eastbound shared Left-Thru-Right	B	13.0	C	15.0	C	15.4
Westbound shared Left-Thru-Right	B	14.1	C	18.5	C	19.7

¹ LOS = Level of Service.

² Delay refers to average control delay in seconds per vehicle

As shown in **Table 3**, all controlled movements at the 244th Avenue NE/NE 18th Street intersection currently operates at LOS C or better during both the AM and PM peak hours. Additionally, all controlled movements at the intersection are anticipated to operate at LOS D or better in 2021 during both the AM and PM peak hours without or with the proposed NE 18th Street Assemblage project.

244th Ave NE/NE 18th Street Assessment

Sight distance and turn lane evaluations were conducted at the intersection of 244th Ave NE and NE 18th Street adjacent to the proposed NE 18th Street Assemblage residential development. The following sections summarize the sight distance and turn lane evaluations.

Sight Distance Evaluation

Both stopping and entering sight distance were evaluated at the existing 244th Avenue NE / NE 18th Street intersection. Field measurements were based on both City of Sammamish and King County Standards. The posted speed limit on 244th Avenue NE at NE 18th Street is 35 MPH.

Stopping Sight Distance (SSD): Based on Table 12.2 (Vertical Curve – Minimum Stopping Sight Distance) in the City of Sammamish *2016 Public Works Standards*, the minimum required stopping sight distance for a 40 MPH design speed (posted speed +5) is 325 feet. Based on Table 2.1 (Arterial Roads, Rural Local and Commercial Access Roads and Streets Design Values) in the King County *2016 Road Design and Construction Standards*, the minimum required stopping sight distance for a 45 MPH design speed (posted speed +10) is 360 feet. SSD was measured based on an approaching vehicle driver eye height of 3.5 feet and an object height of 2.0 feet.

Field measurements confirm the existing available SSD for a vehicle traveling northbound and southbound on 244th Avenue NE approaching NE 18th Street exceeds 360 feet, meeting City and County requirements.

Entering Sight Distance (ESD): Based on the City of Sammamish *2016 Public Works Standards* Figure 02-19A (Sight Obstruction – Stop Controlled Intersections), the minimum required ESD for a 35 MPH posted speed limit is 470 feet. Table 2.1 (Arterial Roads, Rural Local and Commercial Access Roads and Streets Design Values) in the King County *2016 Road Design and Construction Standards*, the minimum required entering sight distance for a 45 MPH design speed (posted speed +10) is 500 feet. ESD was measured based on an entering vehicle driver height 3.5 feet, measured 14.5 feet back from edge of traveled way.

Based on field measurements, the existing available ESD at the 244th Avenue NE / NE 18th Street intersection looking north exceeds 500 feet, meeting both City and County requirements.



View looking north on 244th Avenue NE from NE 18th Street

The existing available ESD at the 244th Avenue NE/NE 18th Street intersection looking south is approximately 325 feet, which does not meet City or County requirements due to an existing wood fence and vegetation in the right-of-way (as seen in the photo below). Once existing wood fence and vegetation are removed as part of the frontage improvements on 244th Avenue NE and NE 18th Street with the proposed NE 18th Street Assemblage project, the available ESD would exceed 500 feet, meeting both City and County standards.



View looking south on 244th Avenue NE from NE 18th Street

Right-Turn Lane Evaluation

A right-turn lane evaluation was conducted to assess the need for a northbound right-turn lane at the 244th Ave NE/NE 18th Street intersection based on Exhibit 1310-11 included in the WSDOT *Design Manual*. The future approach right-turn and thru traffic volume during the AM and PM peak hours (DDHV) on 244th Avenue NE were estimated based on the future 2021 with-project volumes shown previously in **Figure 3**. Based on the estimated future 2021 northbound right-turn volume compared to the total DDHV on 244th Avenue NE, a northbound right-turn lane would not be recommended, as shown in **Figure 4**.

Left-Turn Lane Evaluation

A left-turn lane evaluation was conducted for a southbound left-turn lane at the 244th Ave NE/NE 18th Street intersection based on Exhibit 1310-7a included in the WSDOT *Design Manual*. The total future traffic volumes on 244th Avenue NE (DHV) used in the evaluation were estimated based on the future 2021 with-project volumes shown previously in **Figure 3**.

The evaluation found that a left-turn lane would not be warranted based on year 2021 peak hour traffic volumes (as shown in **Figure 5**); however, the adjacent proposed Kensington 19th Street Assemblage project is proposing to construct a southbound left-turn lane consistent with the City of Sammamish Street Standard for this road classification.

Exhibit 1310-11 Right-Turn Lane Guidelines
224th Ave NE / NE 18th St Northbound Right Turn

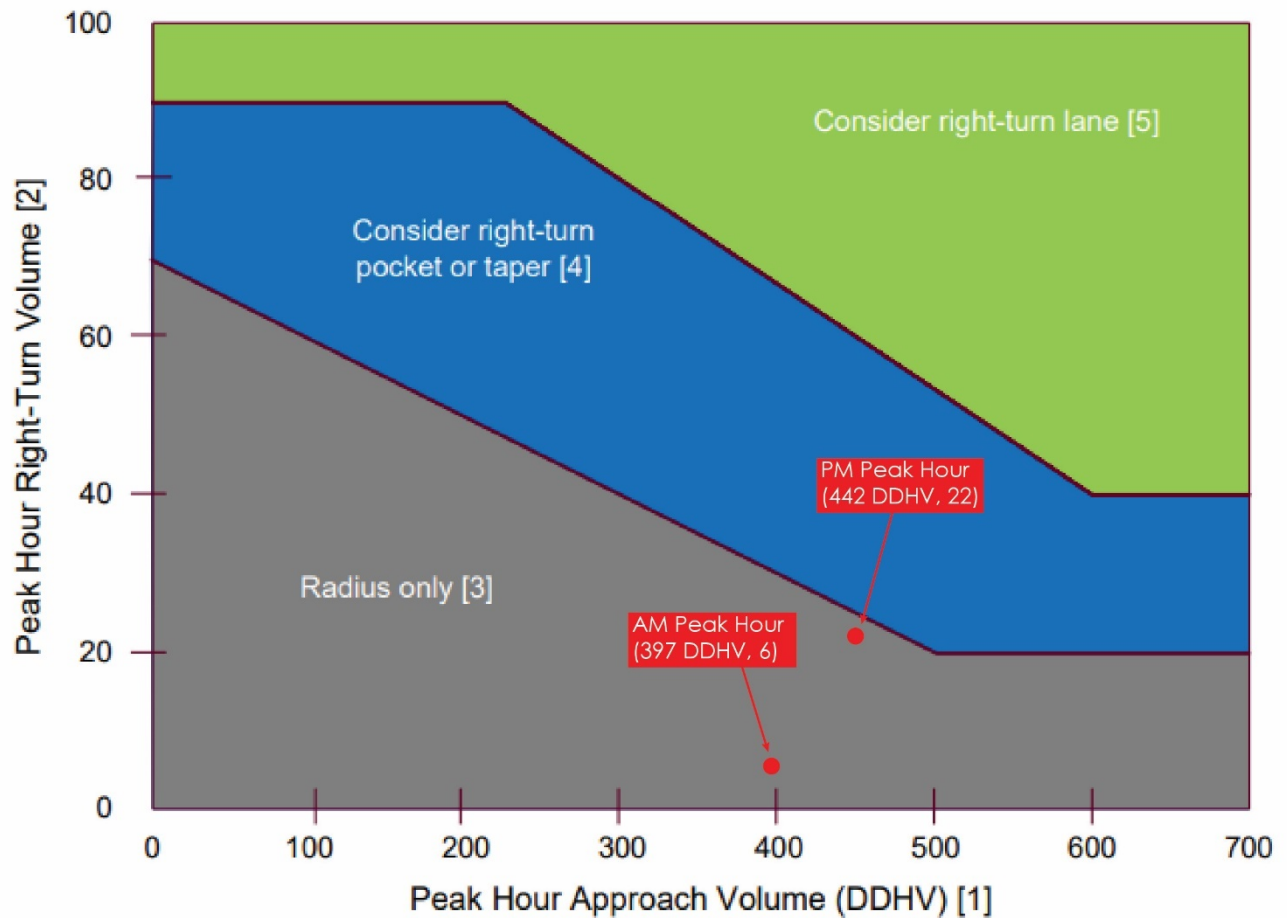


Figure 4: WSDOT Right-Turn Storage Guidelines

Exhibit 1310-7a Left-Turn Storage Guidelines: Two-Lane, Unsignalized

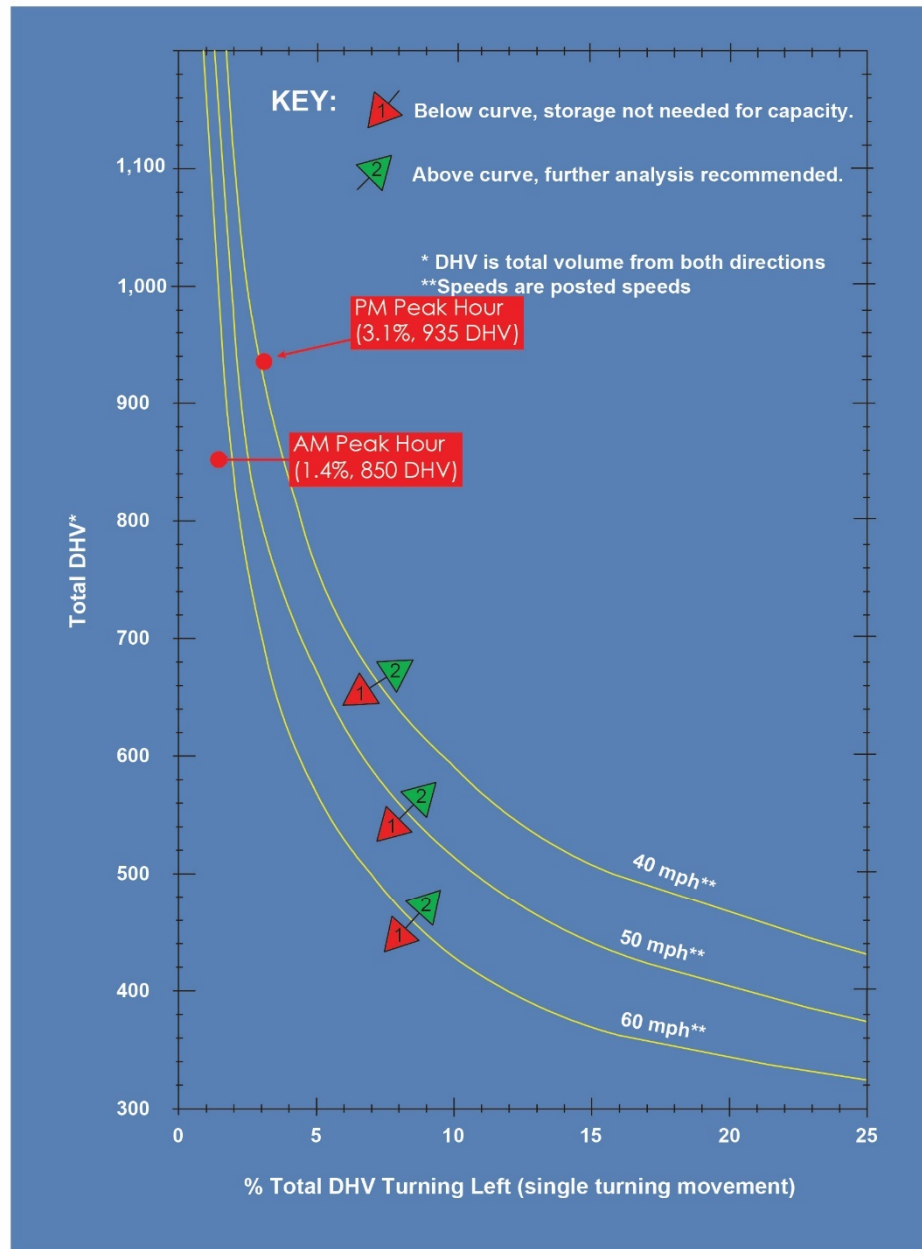


Figure 5: WSDOT Left-Turn Storage Guidelines

Site Access Sight Distance Assessment

Vehicular access to the site would include two new road connections to the existing NE 18th Street. Additionally, lots 20 – 25 will have direct access onto NE 18th Street.

NE 18th Street is classified by King County as an Urban Subcollector. Based on County Road Standards section 2.03(B) Urban Local Access Streets, there is no Entering Sight Distance (ESD) requirement for urban subcollectors. Per section 2.03(B), the design speed for an urban subcollector is 30 MPH.

Proposed West Site Access Intersection on NE 18th Street:

Stopping Sight Distance (SSD)

Based on the King County Standards table 2.2 (Urban Local Access Streets Design Values), the minimum required SSD for a 30 MPH design speed with a 6% upgrade (eastbound) is 184 feet and with a 6% downgrade (westbound) is 215 feet. SSD was measured based on an approaching vehicle driver eye height of 3.5 feet and an object height of 2.0 feet.

SSD Westbound: Based on field measurements, the existing available SSD at the proposed west site access driveway for a vehicle traveling westbound on NE 18th Street exceeds 215 feet.



View looking east on NE 18th Street from proposed West Access

SSD Eastbound: Based on field measurements, the existing available SSD at the proposed west site access driveway for a vehicle traveling eastbound on NE 18th Street exceeds 184 feet.



View looking west on NE 18th Street from proposed West Access

Proposed East Site Access Intersection on NE 18th Street:

Stopping Sight Distance (SSD)

Based on the King County Standards Table 2.2 (Urban Local Access Streets Design Values), the minimum required SSD for a 30 MPH design speed with a 6% upgrade (eastbound) is 184 feet and with a 6% downgrade (westbound) is 215 feet. SSD was measured based on an approaching vehicle driver eye height of 3.5 feet and an object height of 2.0 feet.

SSD Westbound: Based on field measurements, the existing available SSD for a vehicle traveling westbound is approximately 200 feet, which does not meet the County standard. To address this deficiency, some road grading along NE 18th Street would be required to meet minimum SSD requirements.



View looking east on NE 18th Street

SSD Eastbound: Based on field measurements, the existing available SSD for a vehicle traveling eastbound exceeds 184 feet, thus meeting the minimum requirement.



View looking west on NE 18th Street

Safe Walk Route Assessment

The proposed NE 18th Street Assemblage development is located in the Lake Washington School District and is within the Rachel Carson Elementary School, Inglewood Middle School, and Eastlake High School attendance areas. Both the elementary and middle schools are within approximately 1.0 to 1.2 miles walking distance of the proposed project. An existing bus stop serving all three schools is located on 244th Ave NE at NE 18th Street.

As part of the proposed NE 18th Street Assemblage development, sidewalks would be included along the project frontages on 244th Avenue NE and NE 18th Street, and throughout the internal roads of the development including the connection with the adjacent Woodhaven residential project. A continuous walk route for students to/from the elementary and middle schools and the proposed NE 18th Street Assemblage would be provided through the Woodhaven development to the north side of NE 16th Street (at approximately 246th Ave NE). A continuous walk route is also provided via existing sidewalks on the south side of NE 16th Street and the east side of 244th Avenue NE all the way to the existing rapid flash crosswalk in front of Rachel Carson Elementary.

To complete the safe walk route, a crosswalk is recommended on NE 16th Street at the entry to the Woodhaven development (at approximately 246th Ave NE) to allow walking students to safely cross to access the new sidewalk on the east side of 244th Ave NE.

The safe walk route between the proposed NE 18th Street Assemblage and Rachel Carson Elementary and Inglewood Middle School is shown in **Figure 6**.

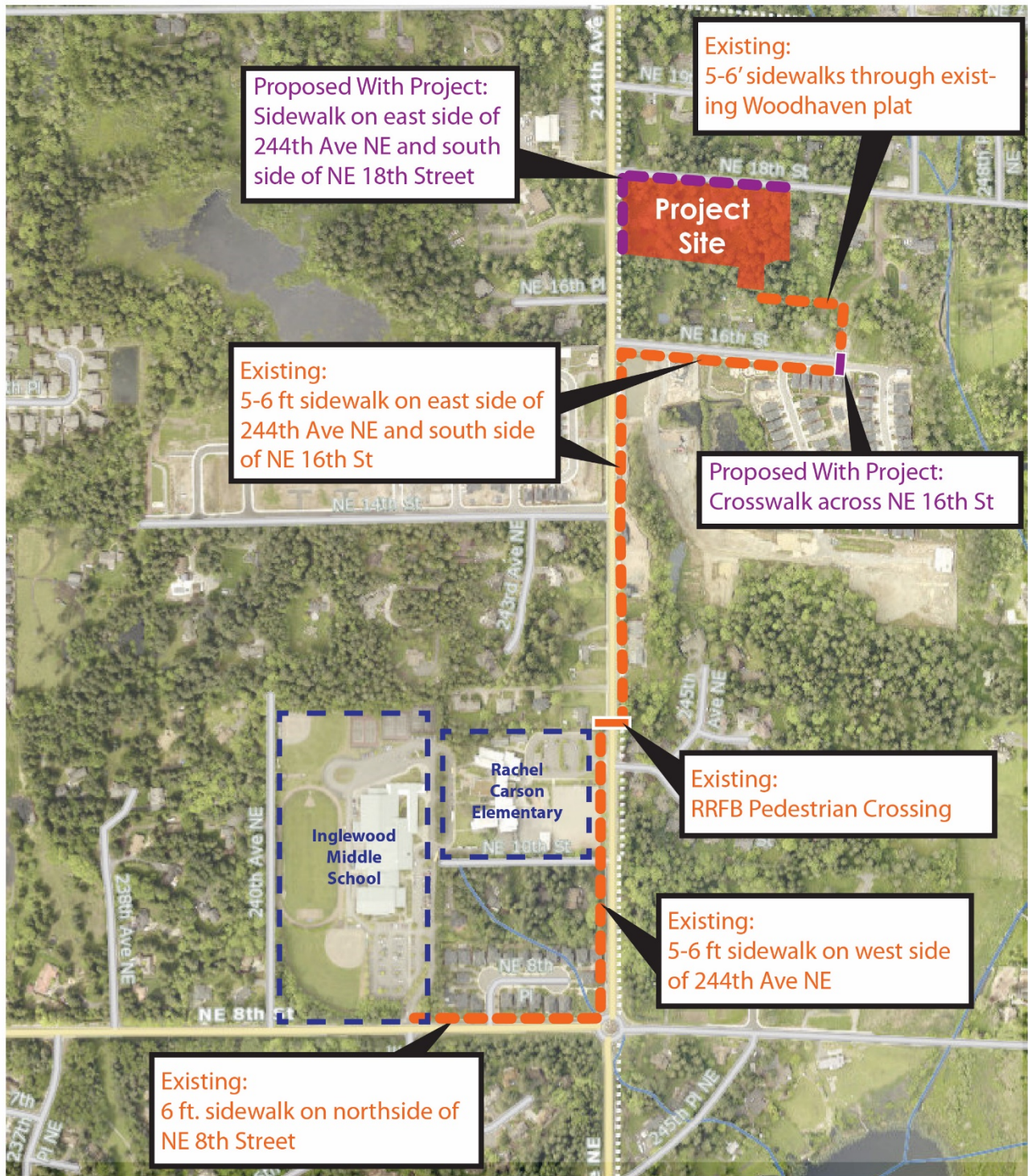


Figure 6: Safe Walk Route Map



Mitigation at 244th Ave NE/NE 18th Street Intersection

The following measures are proposed to mitigate impacts of the proposed NE 18th Street Assemblage residential development at the intersection.

1. Remove the existing fence and vegetation sight distance obstruction on 244th Ave NE just south of NE 18th Street in the public right-of-way to meet entering sight distance requirements prior to final plat approval.
2. Address stopping sight distance (SSD) deficiency at the proposed East Access Road intersection by modifying the road grade to meet minimum requirement.
3. Install a crosswalk across NE 16th Street at approximately 246th Ave NE (near the Woodhaven development).

If you have any questions regarding the information presented in this Level 1 Traffic Impact Analysis, please contact Curtis at (425) 250-5003 or chin@tenw.com.

cc: Jeff Peterson – Toll Brothers
Jeff Haynie, P.E. – TENW Principal
Jeff Schramm – TENW Planning Manager

Attachments

ATTACHMENT A

Trip Generation Calculations

NE 18th Street Assemblage (32 lots)
Trip Generation Summary

Land Use	Units ¹	ITE LUC ²	Directional Distribution		Trip Rate	Trips Generated		
			In	Out		In	Out	Total
Daily								
Proposed Use:								
Single-Family Homes	32 DU	210	50%	50%	EQN	182	182	364
Less Existing Use:								
Single-Family Homes	3 DU	210	50%	50%	9.44	-14	-14	-28
Net New Daily Trips =						168	168	336
AM Peak Hour								
Proposed Use:								
Single-Family Homes	32 DU	210	25%	75%	EQN	7	21	28
Less Existing Use:								
Single-Family Homes	3 DU	210	25%	75%	0.74	-1	-1	-2
Net New AM Peak Hour Trips =						6	20	26
PM Peak Hour								
Proposed Use:								
Single-Family Homes	32 DU	210	63%	37%	EQN	21	13	34
Less Existing Use:								
Single-Family Homes	3 DU	210	63%	37%	0.99	-2	-1	-3
Net New PM Peak Hour Trips =						19	12	31

Notes:

¹ DU = Dwelling Units.

² Institute of Transportation Engineers, *Trip Generation* Manual (10th edition) Land Use Code.

ATTACHMENT B

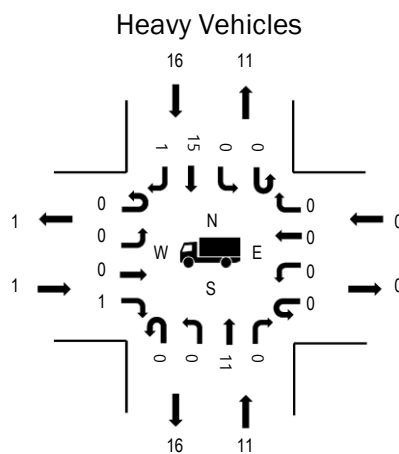
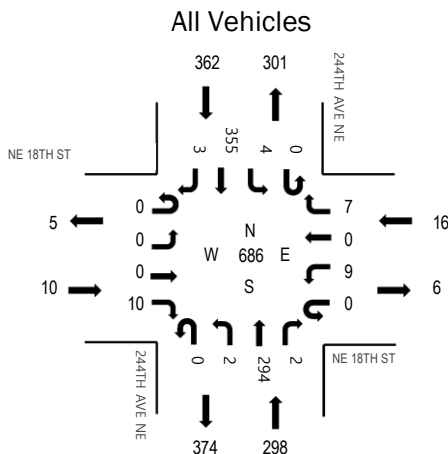
Existing Traffic Count Data



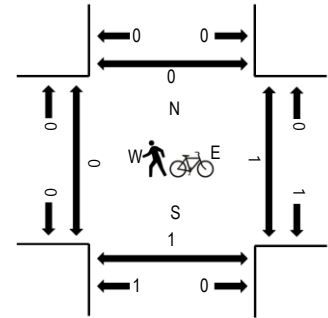
(303) 216-2439
www.alltrafficdata.net

Location: 1 244TH AVE NE & NE 18TH ST AM
Date and Start Time: Tuesday, October 10, 2017
Peak Hour: 07:00 AM - 08:00 AM

Peak Hour



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	10.0%	0.83
WB	0.0%	0.57
NB	3.7%	0.89
SB	4.4%	0.62
All	4.1%	0.72

Traffic Counts - All Vehicles

Interval Start Time	NE 18TH ST Eastbound				NE 18TH ST Westbound				244TH AVE NE Northbound				244TH AVE NE Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
7:00 AM	0	0	0	3	0	6	0	1	0	1	80	0	0	1	145	1	238	686
7:15 AM	0	0	0	3	0	0	0	2	0	0	53	0	0	0	89	0	147	604
7:30 AM	0	0	0	3	0	1	0	3	0	1	81	2	0	1	74	2	168	634
7:45 AM	0	0	0	1	0	2	0	1	0	0	80	0	0	2	47	0	133	632
8:00 AM	0	0	0	1	0	3	0	2	0	0	89	0	0	4	57	0	156	638
8:15 AM	0	0	0	0	0	2	0	1	0	1	84	4	0	0	84	1	177	
8:30 AM	0	0	0	4	0	2	0	1	0	2	91	2	0	1	63	0	166	
8:45 AM	0	0	0	1	0	0	0	2	0	3	63	0	0	2	68	0	139	
Count Total	0	0	0	16	0	16	0	13	0	8	621	8	0	11	627	4	1,324	
Peak Hour	0	0	0	10	0	9	0	7	0	2	294	2	0	4	355	3	686	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

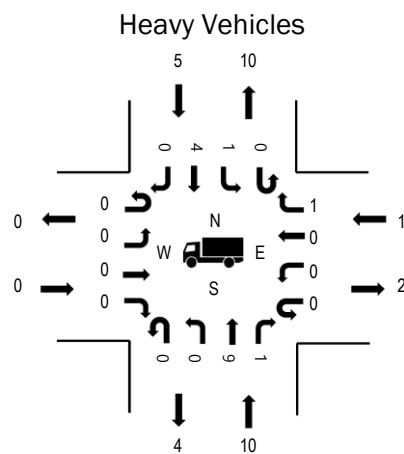
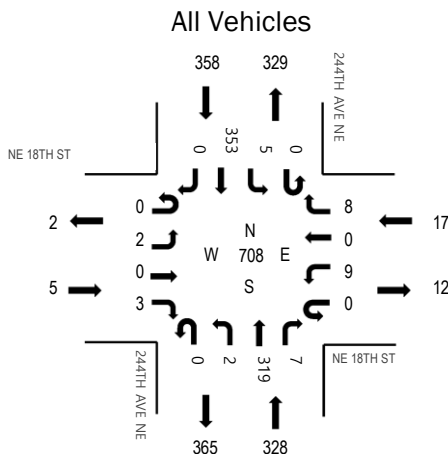
Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
7:00 AM	0	3	0	2	5	7:00 AM	0	1	1	0	2
7:15 AM	0	1	0	7	8	7:15 AM	0	0	0	0	0
7:30 AM	1	5	0	6	12	7:30 AM	0	0	0	0	0
7:45 AM	0	2	0	1	3	7:45 AM	0	0	0	0	0
8:00 AM	1	4	0	5	10	8:00 AM	0	0	0	0	0
8:15 AM	0	2	1	4	7	8:15 AM	0	0	0	0	0
8:30 AM	1	7	0	7	15	8:30 AM	0	0	0	0	0
8:45 AM	0	4	0	3	7	8:45 AM	0	0	0	0	0
Count Total	3	28	1	35	67	Count Total	0	1	1	0	2
Peak Hour	1	11	0	16	28	Peak Hour	0	1	1	0	2



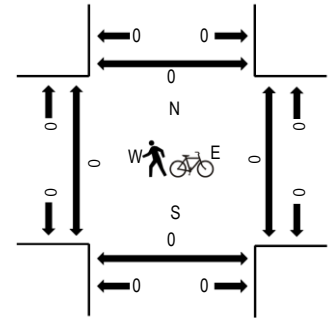
(303) 216-2439
www.alltrafficdata.net

Location: 1 244TH AVE NE & NE 18TH ST PM
Date and Start Time: Tuesday, October 10, 2017
Peak Hour: 05:00 PM - 06:00 PM

Peak Hour



Pedestrians/Bicycles in Crosswalk



	HV%	PHF
EB	0.0%	0.63
WB	5.9%	0.71
NB	3.0%	0.88
SB	1.4%	0.88
All	2.3%	0.93

Traffic Counts - All Vehicles

Interval Start Time	NE 18TH ST Eastbound				NE 18TH ST Westbound				244TH AVE NE Northbound				244TH AVE NE Southbound				Total	Rolling Hour
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
4:00 PM	0	1	0	0	0	1	0	0	0	0	77	2	0	4	65	0	150	579
4:15 PM	0	0	0	1	0	0	0	2	0	4	91	1	0	2	45	0	146	595
4:30 PM	0	1	0	2	0	0	0	1	0	1	64	2	0	3	66	0	140	640
4:45 PM	0	0	0	0	0	4	0	0	0	0	74	2	0	1	62	0	143	684
5:00 PM	0	0	0	2	0	4	0	2	0	2	77	2	0	1	76	0	166	708
5:15 PM	0	1	0	1	0	2	0	1	0	0	93	0	0	0	93	0	191	
5:30 PM	0	1	0	0	0	3	0	3	0	0	72	3	0	3	99	0	184	
5:45 PM	0	0	0	0	0	0	0	2	0	0	77	2	0	1	85	0	167	
Count Total	0	4	0	6	0	14	0	11	0	7	625	14	0	15	591	0	1,287	
Peak Hour	0	2	0	3	0	9	0	8	0	2	319	7	0	5	353	0	708	

Traffic Counts - Heavy Vehicles and Pedestrians/Bicycles in Crosswalk

Interval Start Time	Heavy Vehicles					Interval Start Time	Pedestrians/Bicycles on Crosswalk				
	EB	NB	WB	SB	Total		EB	NB	WB	SB	Total
4:00 PM	1	1	0	1	3	4:00 PM	0	0	0	0	0
4:15 PM	0	3	0	2	5	4:15 PM	0	0	0	0	0
4:30 PM	0	1	0	0	1	4:30 PM	0	0	0	0	0
4:45 PM	0	4	0	1	5	4:45 PM	0	0	0	0	0
5:00 PM	0	3	0	2	5	5:00 PM	0	0	0	0	0
5:15 PM	0	2	0	2	4	5:15 PM	0	0	0	0	0
5:30 PM	0	3	0	1	4	5:30 PM	0	0	0	0	0
5:45 PM	0	2	1	0	3	5:45 PM	0	0	0	0	0
Count Total	1	19	1	9	30	Count Total	0	0	0	0	0
Peak Hour	0	10	1	5	16	Peak Hour	0	0	0	0	0

ATTACHMENT C

Level of Service Methodology

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 at 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 C1 outlines the current HCM (6th Edition) LOS criteria for signalized and unsignalized intersections based on these methodologies.

Table C1
LOS Criteria for Signalized and Unsignalized Intersections¹

<u>SIGNALIZED INTERSECTIONS</u>			<u>UNSIGNALIZED INTERSECTIONS</u>		
Control Delay (sec/veh)	<u>LOS by Volume-to Capacity (V/C) Ratio²</u>		Control Delay (sec/veh)	<u>LOS by Volume-to Capacity (V/C) Ratio³</u>	
	≤ 1.0	> 1.0		≤ 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 (6th Edition), Transportation Research Board, 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.






ATTACHMENT D

LOS Calculations

Lanes, Volumes, Timings
1: 244th Ave NE & NE 18th St

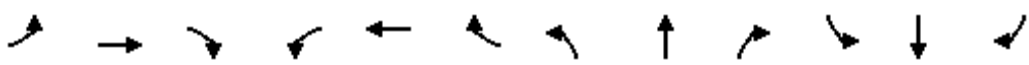




09/06/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	10	9	0	7	2	306	2	4	369	3
Future Volume (vph)	0	0	10	9	0	7	2	306	2	4	369	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		268			663			367			160	
Travel Time (s)		7.3			18.1			8.3			3.6	
Confl. Peds. (#/hr)			1	2		1	1		2	1		
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Heavy Vehicles (%)	10%	10%	10%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	10	9	0	7	2	306	2	4	369	3
Future Vol, veh/h	0	0	10	9	0	7	2	306	2	4	369	3
Conflicting Peds, #/hr	0	0	1	2	0	1	1	0	2	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	72	72	72	72	72	72	72	72	72	72	72
Heavy Vehicles, %	10	10	10	0	0	0	4	4	4	4	4	4
Mvmt Flow	0	0	14	13	0	10	3	425	3	6	513	4
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	967	964	518	971	965	430	518	0	0	430	0	0
Stage 1	528	528	-	435	435	-	-	-	-	-	-	-
Stage 2	439	436	-	536	530	-	-	-	-	-	-	-
Critical Hdwy	7.2	6.6	6.3	7.1	6.5	6.2	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.2	5.6	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.2	5.6	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.5	4	3.3	2.236	-	-	2.236	-	-
Pot Cap-1 Maneuver	226	247	542	234	257	629	1038	-	-	1119	-	-
Stage 1	520	515	-	604	584	-	-	-	-	-	-	-
Stage 2	581	566	-	532	530	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	220	244	540	225	253	627	1037	-	-	1117	-	-
Mov Cap-2 Maneuver	220	244	-	225	253	-	-	-	-	-	-	-
Stage 1	518	510	-	601	581	-	-	-	-	-	-	-
Stage 2	570	563	-	513	525	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.8		17.4		0.1		0.1					
HCM LOS	B		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1037	-	-	540	313	1117	-	-				
HCM Lane V/C Ratio	0.003	-	-	0.026	0.071	0.005	-	-				
HCM Control Delay (s)	8.5	-	-	11.8	17.4	8.2	0	-				
HCM Lane LOS	A	-	-	B	C	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.2	0	-	-				

Lanes, Volumes, Timings
1: 244th Ave NE & NE 18th St






09/06/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	3	9	0	8	2	332	7	5	367	0
Future Volume (vph)	2	0	3	9	0	8	2	332	7	5	367	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		268			663			367			160	
Travel Time (s)		7.3			18.1			8.3			3.6	
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 (%)	0%	0%	0%	6%	6%	6%	3%	3%	3%	1%	1%	1%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary


















Area Type: Other

Control Type: Unsignalized

Intersection												
Int Delay, s/veh	0.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	3	9	0	8	2	332	7	5	367	0
Future Vol, veh/h	2	0	3	9	0	8	2	332	7	5	367	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	6	6	6	3	3	3	1	1	1
Mvmt Flow	2	0	3	10	0	9	2	357	8	5	395	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	775	774	395	772	770	361	395	0	0	365	0	0
Stage 1	405	405	-	365	365	-	-	-	-	-	-	-
Stage 2	370	369	-	407	405	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.16	6.56	6.26	4.13	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.16	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.16	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.554	4.054	3.354	2.227	-	-	2.209	-	-
Pot Cap-1 Maneuver	318	332	659	312	326	675	1158	-	-	1199	-	-
Stage 1	626	602	-	646	616	-	-	-	-	-	-	-
Stage 2	654	624	-	613	592	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	312	330	659	309	324	675	1158	-	-	1199	-	-
Mov Cap-2 Maneuver	312	330	-	309	324	-	-	-	-	-	-	-
Stage 1	625	599	-	645	615	-	-	-	-	-	-	-
Stage 2	645	623	-	607	589	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	13		14.1		0		0.1					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1158	-	-	456	415	1199	-	-				
HCM Lane V/C Ratio	0.002	-	-	0.012	0.044	0.004	-	-				
HCM Control Delay (s)	8.1	-	-	13	14.1	8	0	-				
HCM Lane LOS	A	-	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0	0.1	0	-	-				

Lanes, Volumes, Timings
1: 244th Ave NE & NE 18th St

09/06/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	12	23	0	20	2	386	6	9	437	4
Future Volume (vph)	0	0	12	23	0	20	2	386	6	9	437	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		268			663			367			160	
Travel Time (s)		7.3			18.1			8.3			3.6	
Confl. Peds. (#/hr)			1	2		1	1		2	1		
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Heavy Vehicles (%)	10%	10%	10%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

Intersection												
Int Delay, s/veh	1.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕			↕	
Traffic Vol, veh/h	0	0	12	23	0	20	2	386	6	9	437	4
Future Vol, veh/h	0	0	12	23	0	20	2	386	6	9	437	4
Conflicting Peds, #/hr	0	0	1	2	0	1	1	0	2	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	72	72	72	72	72	72	72	72	72	72	72
Heavy Vehicles, %	10	10	10	0	0	0	4	4	4	4	4	4
Mvmt Flow	0	0	17	32	0	28	3	536	8	13	607	6







Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1198	1189	613	1195	1188	543	614	0	0	546	0	0
Stage 1	637	637	-	548	548	-	-	-	-	-	-	-
Stage 2	561	552	-	647	640	-	-	-	-	-	-	-
Critical Hdwy	7.2	6.6	6.3	7.1	6.5	6.2	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.2	5.6	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.2	5.6	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.5	4	3.3	2.236	-	-	2.236	-	-
Pot Cap-1 Maneuver	157	181	478	165	190	544	956	-	-	1013	-	-
Stage 1	452	459	-	524	520	-	-	-	-	-	-	-
Stage 2	498	502	-	463	473	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	146	176	477	156	185	542	955	-	-	1011	-	-
Mov Cap-2 Maneuver	146	176	-	156	185	-	-	-	-	-	-	-
Stage 1	450	449	-	521	517	-	-	-	-	-	-	-
Stage 2	471	499	-	437	463	-	-	-	-	-	-	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s	12.8		25.7		0		0.2	
HCM LOS	B		D					

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	955	-	-	477	233	1011	-
HCM Lane V/C Ratio	0.003	-	-	0.035	0.256	0.012	-
HCM Control Delay (s)	8.8	-	-	12.8	25.7	8.6	0
HCM Lane LOS	A	-	-	B	D	A	A
HCM 95th %tile Q(veh)	0	-	-	0.1	1	0	-

Lanes, Volumes, Timings
1: 244th Ave NE & NE 18th St






09/06/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	4	19	0	17	2	409	22	19	464	0
Future Volume (vph)	2	0	4	19	0	17	2	409	22	19	464	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		268			663			367			160	
Travel Time (s)		7.3			18.1			8.3			3.6	
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 (%)	0%	0%	0%	6%	6%	6%	3%	3%	3%	1%	1%	1%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary


















Area Type: Other






Control Type: Unsignalized

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	4	19	0	17	2	409	22	19	464	0
Future Vol, veh/h	2	0	4	19	0	17	2	409	22	19	464	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	6	6	6	3	3	3	1	1	1
Mvmt Flow	2	0	4	20	0	18	2	440	24	20	499	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1004	1007	499	997	995	452	499	0	0	464	0	0
Stage 1	539	539	-	456	456	-	-	-	-	-	-	-
Stage 2	465	468	-	541	539	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.16	6.56	6.26	4.13	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.16	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.16	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.554	4.054	3.354	2.227	-	-	2.209	-	-
Pot Cap-1 Maneuver	222	243	576	219	241	599	1060	-	-	1103	-	-
Stage 1	530	525	-	577	561	-	-	-	-	-	-	-
Stage 2	581	565	-	518	515	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	211	236	576	213	234	599	1060	-	-	1103	-	-
Mov Cap-2 Maneuver	211	236	-	213	234	-	-	-	-	-	-	-
Stage 1	529	512	-	576	560	-	-	-	-	-	-	-
Stage 2	562	564	-	501	502	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	15		18.5		0		0.3					
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1060	-	-	365	306	1103	-	-				
HCM Lane V/C Ratio	0.002	-	-	0.018	0.127	0.019	-	-				
HCM Control Delay (s)	8.4	-	-	15	18.5	8.3	0	-				
HCM Lane LOS	A	-	-	C	C	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.4	0.1	-	-				

Lanes, Volumes, Timings
1: 244th Ave NE & NE 18th St


















09/06/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	12	33	0	30	2	386	9	12	437	4
Future Volume (vph)	0	0	12	33	0	30	2	386	9	12	437	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		268			663			367			160	
Travel Time (s)		7.3			18.1			8.3			3.6	
Confl. Peds. (#/hr)			1	2		1	1		2	1		
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Heavy Vehicles (%)	10%	10%	10%	0%	0%	0%	4%	4%	4%	4%	4%	4%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	
Intersection Summary												
Area Type:	Other											
Control Type:	Unsignalized											

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	12	33	0	30	2	386	9	12	437	4
Future Vol, veh/h	0	0	12	33	0	30	2	386	9	12	437	4
Conflicting Peds, #/hr	0	0	1	2	0	1	1	0	2	1	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	72	72	72	72	72	72	72	72	72	72	72	72
Heavy Vehicles, %	10	10	10	0	0	0	4	4	4	4	4	4
Mvmt Flow	0	0	17	46	0	42	3	536	13	17	607	6
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1216	1202	613	1206	1199	546	614	0	0	551	0	0
Stage 1	645	645	-	551	551	-	-	-	-	-	-	-
Stage 2	571	557	-	655	648	-	-	-	-	-	-	-
Critical Hdwy	7.2	6.6	6.3	7.1	6.5	6.2	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.2	5.6	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.2	5.6	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.5	4	3.3	2.236	-	-	2.236	-	-
Pot Cap-1 Maneuver	152	178	478	162	187	541	956	-	-	1009	-	-
Stage 1	448	455	-	522	519	-	-	-	-	-	-	-
Stage 2	492	499	-	458	469	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	137	172	477	152	181	539	955	-	-	1007	-	-
Mov Cap-2 Maneuver	137	172	-	152	181	-	-	-	-	-	-	-
Stage 1	446	443	-	519	516	-	-	-	-	-	-	-
Stage 2	452	497	-	430	456	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	12.8		29.8		0		0.2					
HCM LOS	B		D									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	955	-	-	477	231	1007	-	-				
HCM Lane V/C Ratio	0.003	-	-	0.035	0.379	0.017	-	-				
HCM Control Delay (s)	8.8	-	-	12.8	29.8	8.6	0	-				
HCM Lane LOS	A	-	-	B	D	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	1.7	0.1	-	-				

Lanes, Volumes, Timings
1: 244th Ave NE & NE 18th St






09/06/2018

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	4	25	0	23	2	409	31	29	464	0
Future Volume (vph)	2	0	4	25	0	23	2	409	31	29	464	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	50		0	0		0
Storage Lanes	0		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		268			663			367			160	
Travel Time (s)		7.3			18.1			8.3			3.6	
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 (%)	0%	0%	0%	6%	6%	6%	3%	3%	3%	1%	1%	1%
Shared Lane Traffic (%)												
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	0	4	25	0	23	2	409	31	29	464	0
Future Vol, veh/h	2	0	4	25	0	23	2	409	31	29	464	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	0	0	0	6	6	6	3	3	3	1	1	1
Mvmt Flow	2	0	4	27	0	25	2	440	33	31	499	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1034	1038	499	1024	1022	457	499	0	0	473	0	0
Stage 1	561	561	-	461	461	-	-	-	-	-	-	-
Stage 2	473	477	-	563	561	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.16	6.56	6.26	4.13	-	-	4.11	-	-
Critical Hdwy Stg 1	6.1	5.5	-	6.16	5.56	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	6.16	5.56	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.554	4.054	3.354	2.227	-	-	2.209	-	-
Pot Cap-1 Maneuver	212	233	576	210	232	595	1060	-	-	1094	-	-
Stage 1	516	513	-	573	559	-	-	-	-	-	-	-
Stage 2	576	559	-	504	504	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	197	223	576	202	222	595	1060	-	-	1094	-	-
Mov Cap-2 Maneuver	197	223	-	202	222	-	-	-	-	-	-	-
Stage 1	515	493	-	572	558	-	-	-	-	-	-	-
Stage 2	551	558	-	481	484	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	15.4		19.7		0		0.5					
HCM LOS	C		C									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1060	-	-	351	296	1094	-	-				
HCM Lane V/C Ratio	0.002	-	-	0.018	0.174	0.029	-	-				
HCM Control Delay (s)	8.4	-	-	15.4	19.7	8.4	0	-				
HCM Lane LOS	A	-	-	C	C	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.1	0.6	0.1	-	-				