



**lancaster  
moble**

# Wood Duck Springs Comprehensive Plan / Zone Map Change

## Transportation Impact Study

### Vancouver, Washington

Date:

November 12, 2023

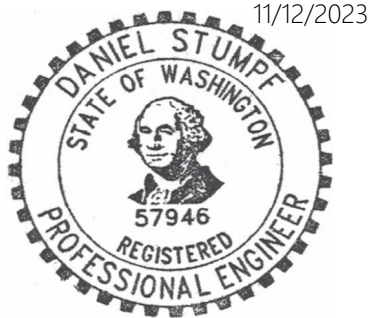
Prepared for:

Nick Zodrow

Songbird Holding LLC

Prepared by:

Daniel Stumpf, PE



## Table of Contents

Executive Summary	4
Project Description	5
Introduction	5
Location Description	5
Vicinity Streets	6
Study Intersections	7
Site Trips	9
Trip Generation	9
Existing R-9 Zoning	9
Proposed R-22 and CC Zoning	9
Analysis Results	10
Trip Distribution	10
Traffic Volumes	14
2023 Existing Conditions	14
2026 Background Conditions	14
Volume Growth	14
In-Process Data	14
2026 Background Conditions with Zone Change	15
2031 Future Conditions with Zone Change	15
Safety Analysis	22
Crash History Review	22
NE 63 <sup>rd</sup> Street at NE Andresen Road	23
NE 63 <sup>rd</sup> Street at NE 72 <sup>nd</sup> Avenue	23
Analysis Summary	23
Sight Distance Evaluation	24
Methodology	24
Field Measurements	24
Analysis Findings	24
Warrants Analysis	25
Left-Turn Lane Warrants	25
Preliminary Traffic Signal Warrants	25
Operational Analysis	26
Intersection Capacity Analysis	26
Performance Standards	26
Delay & Capacity Analysis	26
Conclusions	29



# Appendices

## Appendix A – Trip Generation and Distribution

- Trip Generation
- RTC Data

## Appendix B – Traffic Volumes

- Traffic Counts
- In-Process Data

## Appendix C – Safety Analysis

- Crash History Data
- Left-Turn Lane Warrants
- Traffic Signal Warrant Analysis

## Appendix D – Operation Analysis

- Level of Service Descriptions
- Capacity Reports



## List of Figures

Figure 1: Aerial Photo of Site Vicinity (Image from Google Earth)	6
Figure 2: Vicinity Map	8
Figure 3: Existing R-9 Trip Distribution & Assignment	12
Figure 4: Proposed R-22 & CC Trip Distribution & Assignment	13
Figure 5: Year 2023 Existing Conditions	16
Figure 6: Year 2026 Background Conditions	17
Figure 7: Year 2026 Background Conditions with Existing Zone	18
Figure 8: Year 2026 Background Conditions with Proposed Zones	19
Figure 9: Year 2031 Future Conditions with Existing Zone	20
Figure 10: Year 2031 Future Conditions with Proposed Zones	21

## List of Tables

Table 1: Vicinity Roadway Descriptions	6
Table 2: Study Intersection Description	7
Table 3: Proposed Zone Change Trip Generation Summary	10
Table 4: Crash Type Summary	22
Table 5: Crash Severity and Rate Summary	23
Table 6: Intersection Capacity Analysis Summary	27



## Executive Summary

1. The proposed Wood Duck Springs Comprehensive Plan Amendment/Zone Change project will include the rezone of six properties located at/near 8208 NE 63<sup>rd</sup> Street in Vancouver, Washington. The proposal will rezone the properties from Urban Low Density (R-9) to Urban High Density (R-22) and Community Commercial (CC), where approximately one acre will be allocated to the CC zone. Future access to the site will likely be provided via a future north leg at the intersection of NE 63<sup>rd</sup> Street at NE 81<sup>st</sup> Avenue.
2. The trip generation calculations show that under the existing R-9 zone, the subject site could reasonably generate up to 79 AM peak hour trips, 105 PM peak hour trips, and 1,050 average weekday trips. Under the proposed R-22 and CC zones, the site could reasonably generate up to 123 AM peak hour trips, 172 PM peak hour trips, and 2,184 average weekday trips. Accordingly, the net change in the trip generation potential of the site after the proposed rezone is projected to increase by 44 AM peak hour trips, 67 PM peak hour trips, and 1,134 average weekday trips.
3. No significant trends or crash patterns were identified at the study intersections that are indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.
4. Adequate intersection sight distances are available at the site access approach at the intersection of NE 63<sup>rd</sup> Street at NE 81<sup>st</sup> Avenue to allow for safe and efficient operation of the intersection. No mitigation is necessary or recommended at the intersection with respect to intersection sight distance.
5. Left turn lane warrants are projected to be met at the eastbound approach at the intersection of NE 63<sup>rd</sup> Street at NE 81<sup>st</sup> Avenue under year 2026 conditions with the proposed zone change implemented. To accommodate this left-turn lane the existing median on the west intersection leg can be re-stripped accordingly. Left-turn lane warrants are not projected to be met at any of the other study intersections. No other new left-turn lanes are necessary or recommended at these study intersections.
6. Traffic signal warrants are not projected to be met at the unsignalized study intersections under year 2031 conditions with the zone change implemented. Therefore, no new traffic signals are necessary or recommended as part of the proposed comprehensive plan/zone map change application.
7. All study intersections are currently operating acceptably per City of Vancouver standards and are projected to continue operating acceptably through year 2031, approximately five years beyond an assumed buildout year of the site following approval of the proposed zone change. Accordingly, no operational mitigation is necessary or recommended at the study intersections.



# Project Description

## Introduction

The proposed Wood Duck Springs Comprehensive Plan Amendment/Zone Change project will include the rezone of six properties located at/near 8208 NE 63<sup>rd</sup> Street in Vancouver, Washington. The proposal will rezone the properties from Urban Low Density (R-9) to Urban High Density (R-22) and Community Commercial (CC), where approximately one acre will be allocated to the CC zone. Future access to the site will likely be provided via a future north leg at the intersection of NE 63<sup>rd</sup> Street at NE 81<sup>st</sup> Avenue.

Based on correspondence with City of Vancouver staff, the report conducts safety and capacity/level of service analyses at the following intersections:

1. NE 63<sup>rd</sup> Street at NE Andresen Road
2. NE 63<sup>rd</sup> Street at NE 72<sup>nd</sup> Avenue
3. NE 63<sup>rd</sup> Street at NE 81<sup>st</sup> Avenue (Site Access)
4. NE 58<sup>th</sup> Street at NE 81<sup>st</sup> Avenue
5. NE 58<sup>th</sup> Street at NE 82<sup>nd</sup> Avenue

The purpose of this study is to determine whether the transportation system within the vicinity of the site is capable of safely and efficiently supporting existing uses and potential on-site development following approval of the zone change, and to determine any mitigation that may be necessary to do so. Detailed information on traffic counts, trip generation calculations, safety analyses, and level of service calculations is included in the appendix to this report.

## Location Description

The project site is located north of NE 63<sup>rd</sup> Street, east of NE 78<sup>th</sup> Avenue and west of NE 84<sup>th</sup> Place in Vancouver, Washington. The subject site consists of six properties (assessor parcels 105241000, 105242000, 105190005, 105190010, 105190000, and 986042813) which encompass an approximate total of 13.8 acres. The site is located within a predominately residential area of the City, with a mix of residential uses and undeveloped land surrounding the site in all directions. One notable development near the project site is Vancouver Mall, located approximately a half mile to the south of the site.

Figure 1 presents an aerial image of the nearby vicinity with the project site outlined in yellow.



Figure 1: Aerial Photo of Site Vicinity (Image from Google Earth)

**Vicinity Streets**

The study intersections are composed of six roadways. Table 1 provides a description of these vicinity roadways.

**Table 1: Vicinity Roadway Descriptions**

Street Name	Jurisdiction	Functional Classification	Speed (MPH)	On-Street Parking	Curbs & Sidewalks	Bicycle Lanes
NE 63rd Street	Vancouver/ Clark County	Collector/Minor Arterial	35/40	Not Permitted	Partial Both Sides	Both Sides
NE 58th Street	Vancouver/ Clark County	Collector Arterial	25/30	Partially Permitted	Partial Both Sides	None
NE Andresen Road	Vancouver	Principal Arterial	40	Not Permitted	Both Sides	Partial Both Sides
NE 72nd Avenue	Vancouver	Collector Arterial	30	Partially Permitted	Partial Both Sides	Partial Both Sides
NE 81st Avenue	Vancouver	Collector Arterial	25	Permitted	Both Sides	None
NE 82nd Avenue	Vancouver	Collector/Minor Arterial	25	Partially Permitted	Both Sides	Partial Both Sides

Table Notes: Functional classification based on Vancouver Arterial Street System and Classification map.



### Study Intersections

At the request of the City of Vancouver, an analysis of five nearby intersections is required as part of the zone change analysis. A summarized description of these study intersections is provided in Table 2.

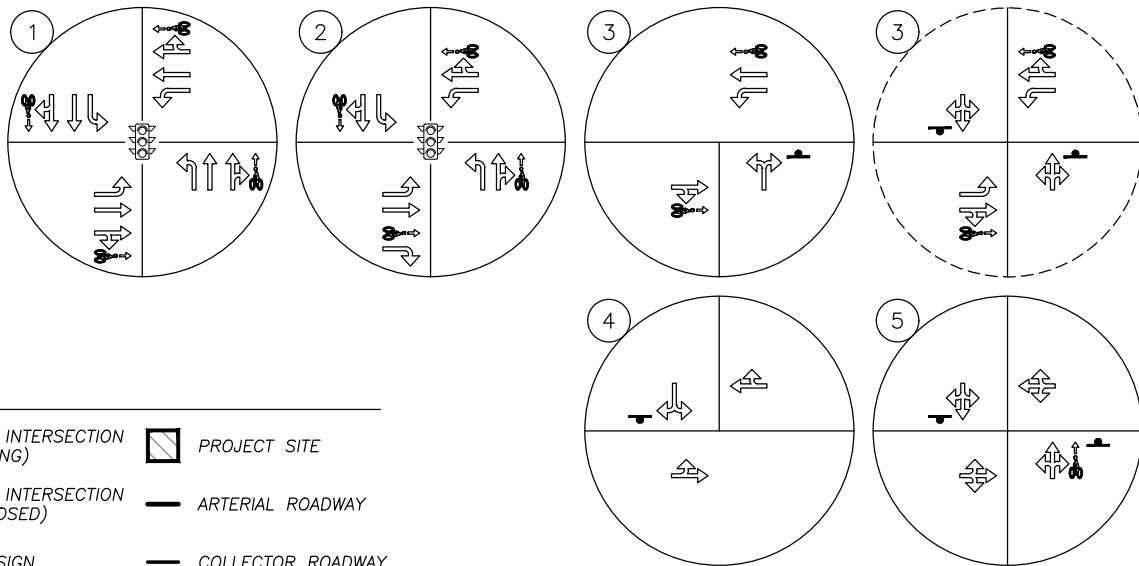
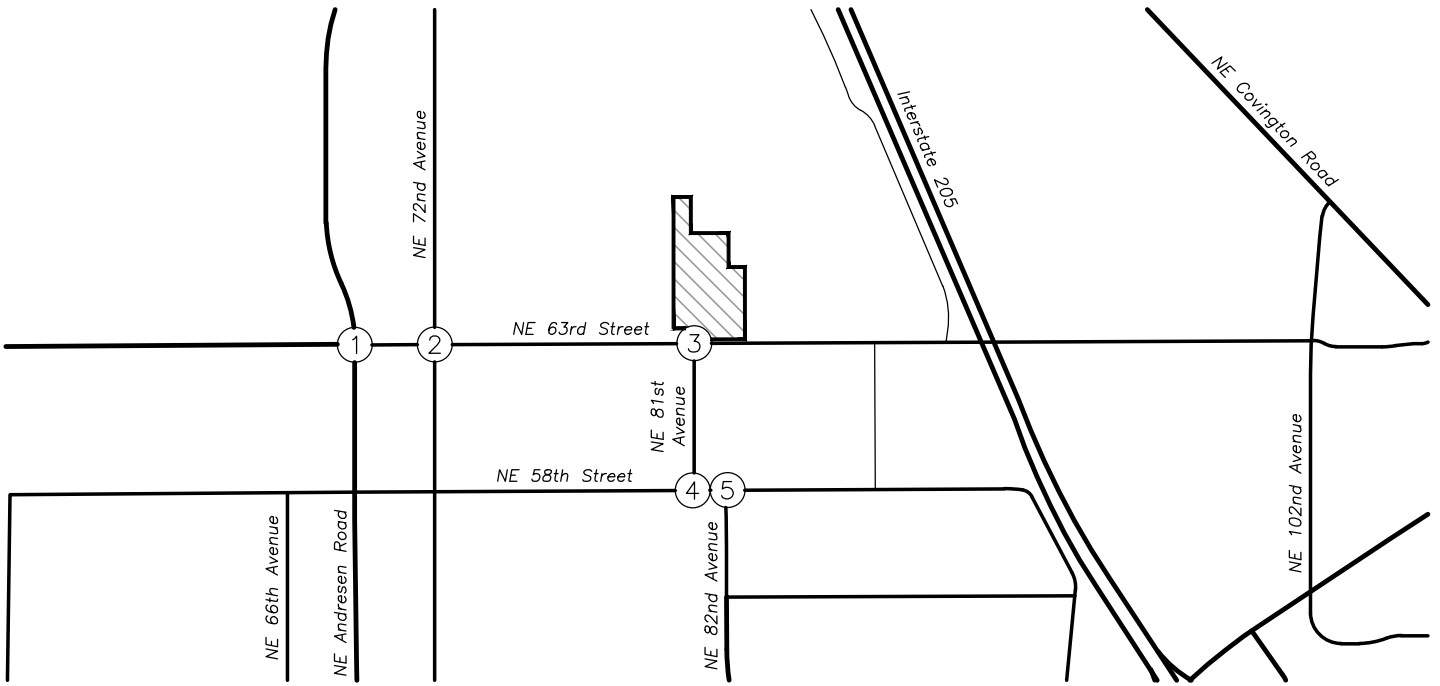
**Table 2: Study Intersection Description**

Number	Intersection	Geometry	Traffic Control	Phasing/Stopped Approaches
1	NE 63rd Street at NE Andresen Road	Four-Legged	Traffic Signal	Protected NB/SB/EB/WB Left-turns, Overlap EB Right turn
2	NE 63rd Street at NE 72nd Avenue	Four-Legged	Traffic Signal	Permitted NB/SB Left-turns, Permitted/Protected EB/WB Left-turns
3	NE 63rd Street at NE 81st Avenue	Three-Legged	Stop-Controlled	Stop-Controlled NB Approach
4	NE 58th Street at NE 81st Avenue	Three-Legged	Stop-Controlled	Stop-Controlled SB Approach
5	NE 58th Street at NE 82nd Avenue	Four-Legged	Stop-Controlled	Stop-Controlled NB/SB Approaches

A vicinity map showing the project site, vicinity streets, and study intersection configuration are shown in Figure 2.







**LEGEND**

- STUDY INTERSECTION (EXISTING)
- STUDY INTERSECTION (PROPOSED)
- ⊣ STOP SIGN
- 🚦 TRAFFIC SIGNAL
- 🚲 BIKE LANE
- ▨ PROJECT SITE
- ARTERIAL ROADWAY
- COLLECTOR ROADWAY
- LOCAL ROADWAY



no scale

# Site Trips

## Trip Generation

The subject site is currently zoned as R-9 and is proposed for a change in zoning to R-22 and CC, where approximately one acre will be allocated to the CC zone. To determine the potential impacts of the proposed zone change, reasonable “worst-case” development scenarios for the existing and proposed zones were determined utilizing data for the most traffic-intensive uses permitted within each zone.

### Existing R-9 Zoning

To determine a reasonable “worst-case” development scenario under the existing R-9 zone, Vancouver Municipal Code (VMC) section 20.410 *Commercial and Mixed-Use Districts* was referenced and compared to a variety of land uses provided within the *Trip Generation Manual*<sup>1</sup>. Based on an assessment of permitted uses under the R-9 zone, data from land use code 210, *Single-Family Detached Housing*, was used to estimate the existing trip generation potential of the site based on number of dwelling units. Note the City of Vancouver utilizes alternative trip generation rates for land use code 210 which slightly vary from the 11<sup>th</sup> Edition of the *Trip Generation Manual*.

To determine a reasonable maximum dwelling unit count that could be developed within the site, the maximum unit per net acre density rate was referenced from VMC 20.410.040, where an R-9 zone has a maximum 8.7 units per net acre of developable space. To determine a net acre area of developable space on the site, it is assumed that a reasonable, if not conservative, 20% reduction in site buildable area will be necessary to accommodate streets/right-of-way improvements, public space, etc. The project site encompasses approximately 13.8 acres. Based on correspondence with the applicant’s team approximately 12.0 net developable acres was considered for analysis, resulting in a reasonable “worst-case” development scenario of up to 105 single-family houses.

### Proposed R-22 and CC Zoning

To determine a reasonable “worst-case” development scenario under the proposed R-22 and CC zones, VMC sections 20.420 *Higher Density Residential Districts* and 20.430 *Commercial and Mixed Use Districts* were referenced. Based on an assessment of permitted uses under the R-22 and CC zones and evaluating what could reasonably be developed on-site, data from the following land use codes were used to estimate the proposed trip generation potential of the site:

- 220, *Multifamily Housing (Low-Rise)*, based on number of dwelling units.
- 492, *Health/Fitness Club*, based on the square footage of the gross building floor area.

To determine a dwelling unit count within the proposed R-22 zone, the maximum unit per acre density rate from City code was referenced from VMC 20.420.040, where an R-22 zone allows for a maximum 22 units per acre of developable space. For the CC zone and referring to VMC 20.430.040, no specific minimum floor-to-area (FAR) ratio or building coverage standards are provided. The R-22 zone will encompass approximately 12.86 acres while the remaining site area will be applied to the CC zone. Based on these assumptions the

---

<sup>1</sup> Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 11<sup>th</sup> Edition, 2021.

reasonable “worst-case” development scenario may include the development of up to 283 multifamily dwellings and an approximate 8,000 square foot gym/fitness center.

**Analysis Results**

The trip generation calculations show that under the existing R-9 zone, the subject site could reasonably generate up to 79 AM peak hour trips, 105 PM peak hour trips, and 1,050 average weekday trips. Under the proposed R-22 and CC zones, the site could reasonably generate up to 123 AM peak hour trips, 172 PM peak hour trips, and 2,184 average weekday trips. Accordingly, the net change in the trip generation potential of the site after the proposed rezone is projected to increase by 44 AM peak hour trips, 67 PM peak hour trips, and 1,134 average weekday trips.

The trip generation estimates are summarized in Table 3. Detailed trip generation calculations are included in the technical appendix.

**Table 3: Proposed Zone Change Trip Generation Summary**

ITE Code	Size		AM Peak Hour			PM Peak Hour			Weekday Total
			Enter	Exit	Total	Enter	Exit	Total	
<i>Existing R-9 Zone</i>									
Single-Family Detached Housing	210	105 units	20	59	79	66	39	105	1,050
<i>Proposed R-22 and CC Zones</i>									
Multifamily Housing (Low-Rise)	220	283 units	27	86	113	91	53	144	1,908
Heath/Fitness Club	492	8,000 SF	5	5	10	16	12	28	276
Total Trips			32	91	123	107	65	172	2,184
<i>Net Change In Site Trip Generation Potential</i>									
<b>Net Increase</b>			<b>12</b>	<b>32</b>	<b>44</b>	<b>41</b>	<b>26</b>	<b>67</b>	<b>1,134</b>

**Trip Distribution**

The trip distribution for the project site was derived using the Southwest Washington Regional Transportation Council (RTC) transportation system model. The project site is located in Transportation Analysis Zone (TAZ) #1861, for which a select zone analysis was run to determine the distribution of site trips entering and exiting the zone.

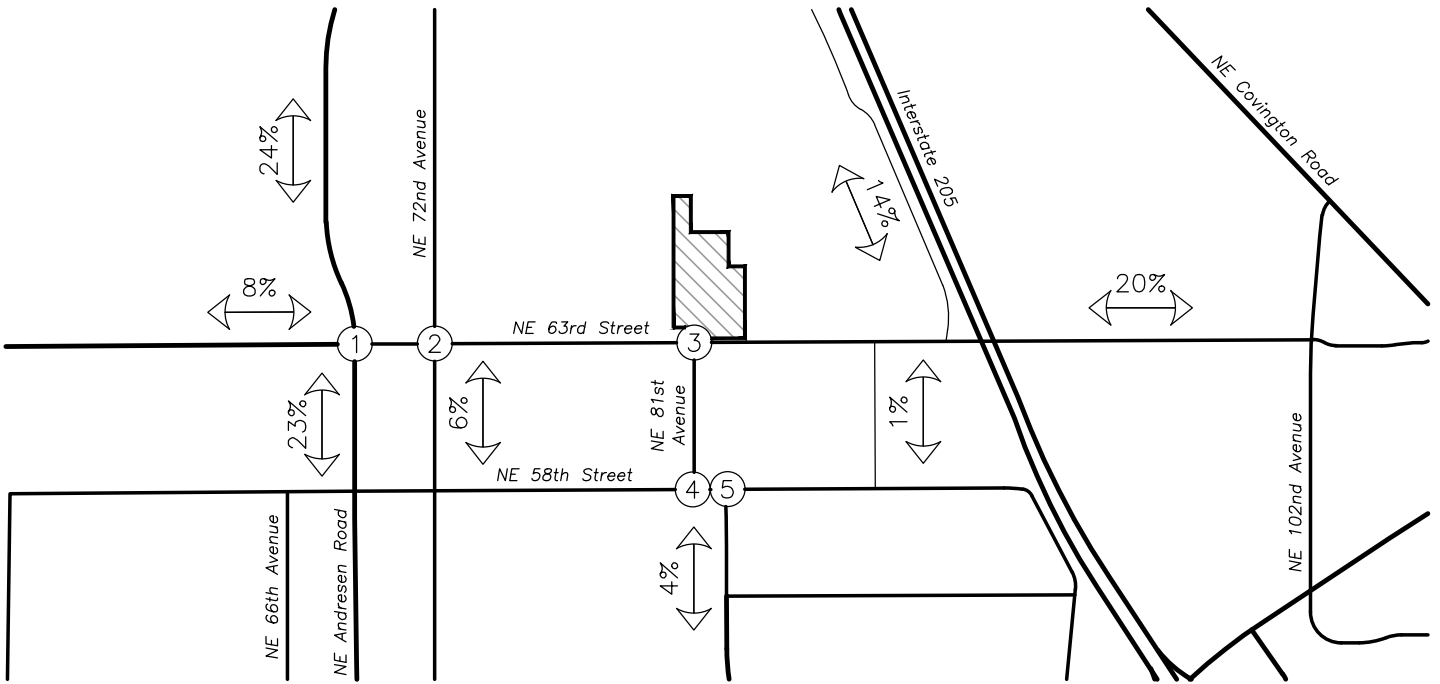


Using information from the RTC model, the following trip distribution is projected within the immediate site vicinity:

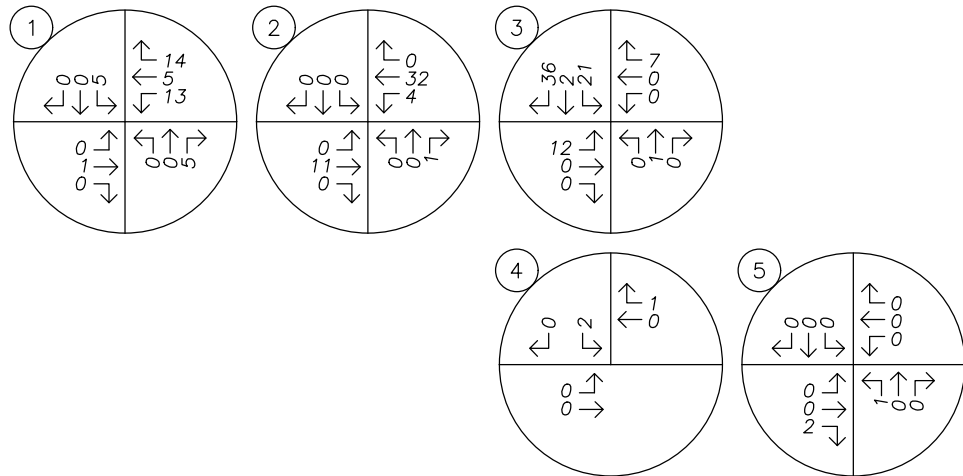
- Approximately 24% of site trips will travel to/from the north along NE Andresen Road, north of NE 63<sup>rd</sup> Street.
- Approximately 23% of site trips will travel to/from the south along NE Andresen Road, south of NE 63<sup>rd</sup> Street.
- Approximately 20% of site trips will travel to/from the east along NE 63<sup>rd</sup> Street, east of NE Meadows Drive.
- Approximately 14% of site trips will travel to/from the north along NE Meadows Drive, north of NE 63<sup>rd</sup> Street.
- Approximately 8% of site trips will travel to/from the west along NE 63<sup>rd</sup> Street, west of NE Andresen Road.
- Approximately 6% of site trips will travel to/from the south along NE 72<sup>nd</sup> Avenue, south of NE 63<sup>rd</sup> Street.
- Approximately 4% of site trips will travel to/from the south along NE 81<sup>st</sup> Avenue, south of NE 63<sup>rd</sup> Street.
- Approximately 1% of site trips will travel to/from the south along NE 87<sup>th</sup> Avenue, south of NE 63<sup>rd</sup> Street.

The trip distribution and assignment for the site trips generated during the AM and PM peak hours are shown in Figure 3 and Figure 4 for the existing and proposed zone scenarios, respectively.

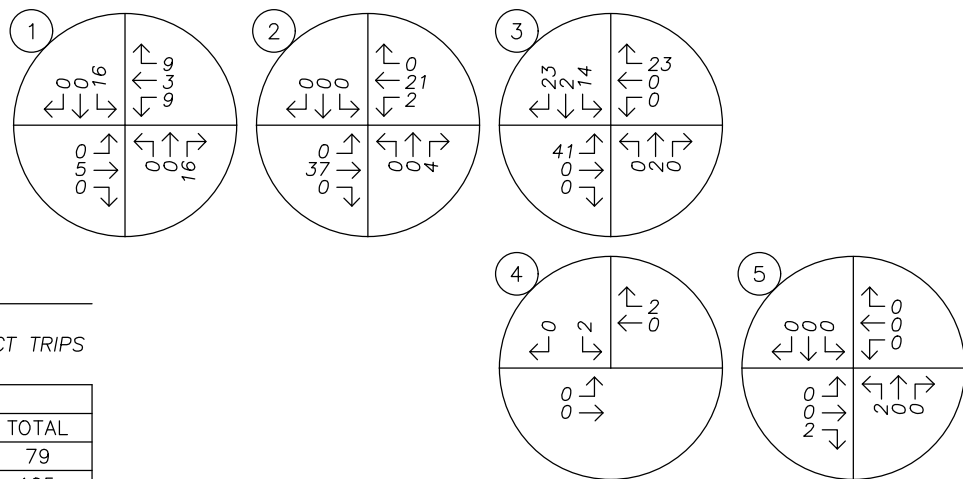




AM PEAK HOUR



PM PEAK HOUR

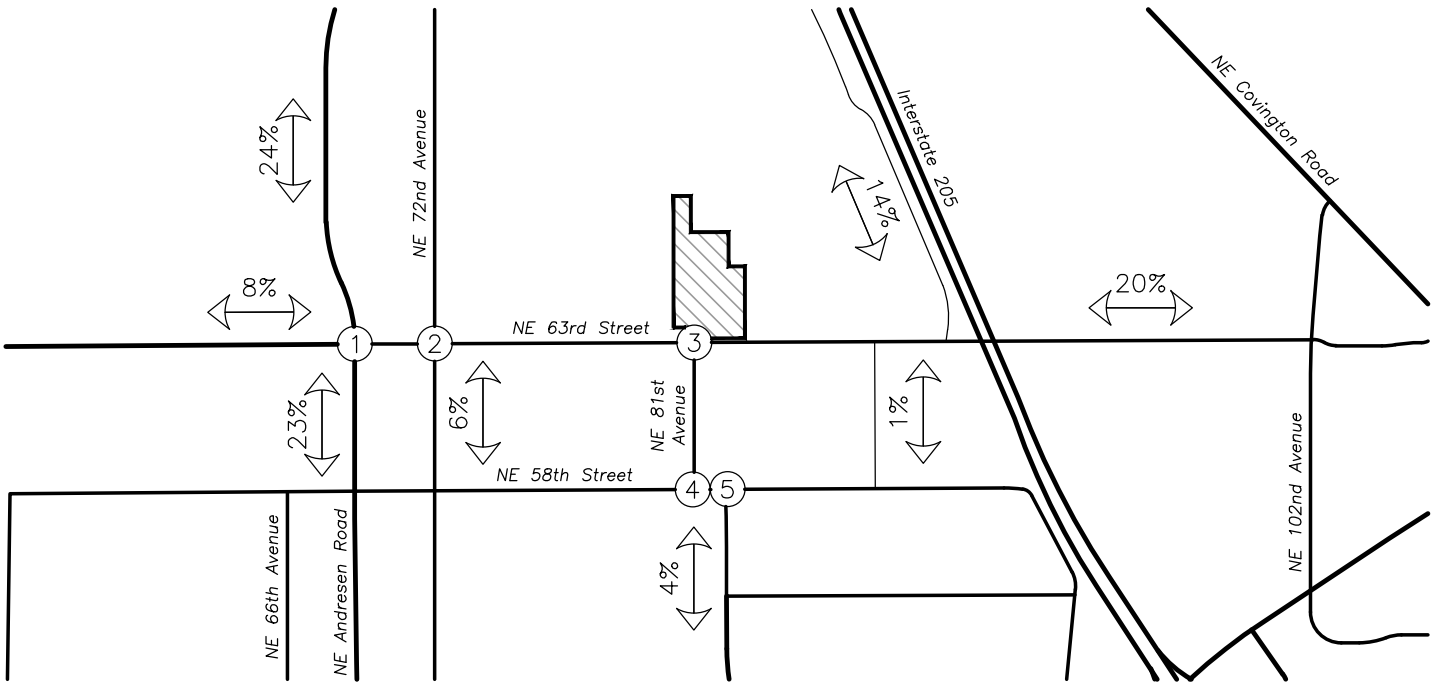


LEGEND

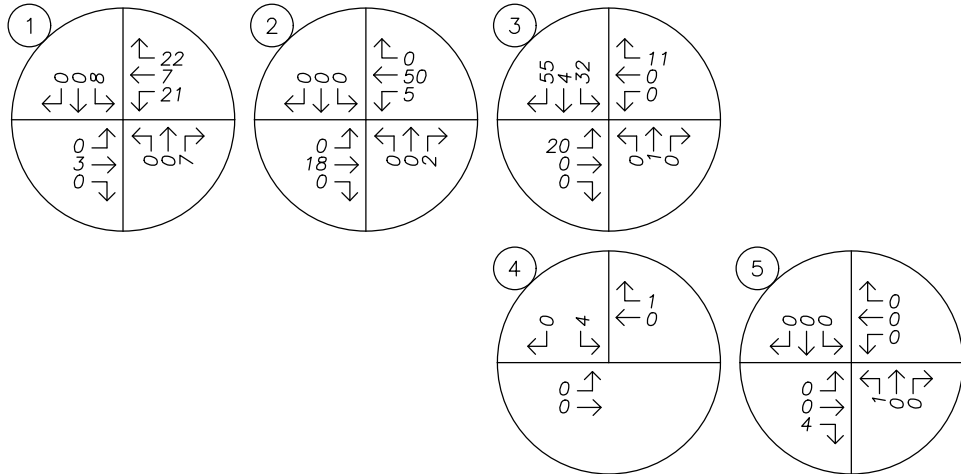
XX% PERCENT OF PROJECT TRIPS

NET TRIP GENERATION			
	IN	OUT	TOTAL
AM	20	59	79
PM	66	39	105

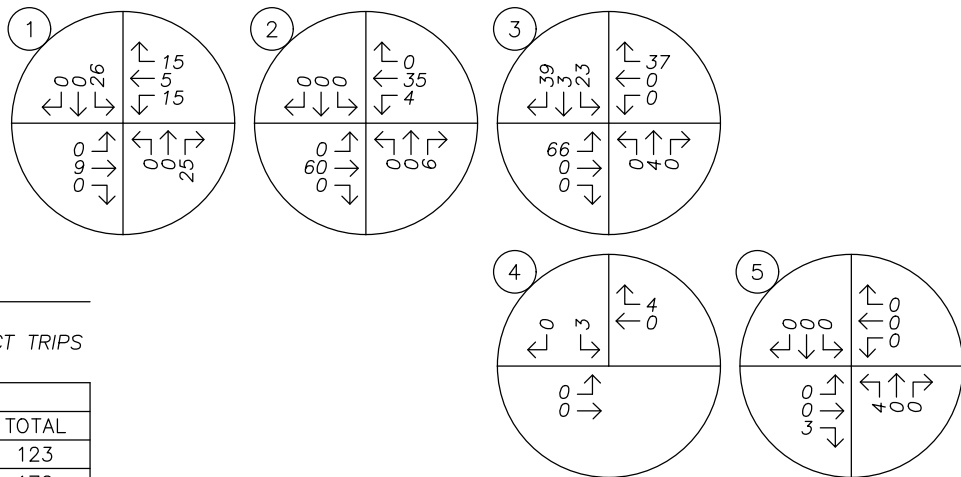




AM PEAK HOUR



PM PEAK HOUR



LEGEND

XX% PERCENT OF PROJECT TRIPS

NET TRIP GENERATION			
	IN	OUT	TOTAL
AM	32	91	123
PM	107	65	172



no scale

## Traffic Volumes

### 2023 Existing Conditions

Traffic counts were conducted at the study intersections on Thursday, September 21, 2023, from 7:00 AM to 9:00 AM and from 4:00 PM to 6:00 PM. Data was used from each intersection's respective AM and PM peak hours.

Figure 4 shows the year 2023 existing traffic volumes at the study intersections during the AM and PM peak hours.

### 2026 Background Conditions

#### Volume Growth

To provide an analysis of the potential impact of the proposed zone change on the nearby transportation facilities, an estimate of future traffic volumes is required. In order to approximate the future year 2026 traffic volumes at the study intersections, the estimated year of when the project site may redevelop as a higher intensive trip generating use, a compounded growth rate of 1.5% per year was applied to the 2023 existing traffic volumes in accordance with the City of Vancouver's Traffic Study Guidelines, dated September 2021. The growth rate was applied to the existing counts over a three-year period, assuming a 2026 site buildout year.

#### In-Process Data

In addition to the traffic volume growth described above, there are several in-process developments that are currently approved/proposed for construction within the site vicinity that are expected to impact nearby study intersections. These in-process developments include the following:

1. Park Meadow Subdivision
2. 66<sup>th</sup> Avenue Cottages
3. NE 62<sup>nd</sup> Street Apartments
4. NE 63<sup>rd</sup> Street Storage Facility
5. NE 63<sup>rd</sup> Street Infill Subdivision
6. Velendo Industrial Park

The in-process developments are not currently/fully contributing trips to the transportation system but may potentially be by the assumed 2026 buildout year of the site. Additional trips corresponding to each in-process development were added to the existing year traffic volumes in addition to the three years of traffic growth at each of the applicable study intersections. To maintain a conservative analysis of operation at the study intersections, all in-process developments were assumed to be constructed by year 2026. Figure A in the technical appendix shows the in-process development trips at the study intersections during the AM and PM peak hours.

Figure 5 shows the projected year 2026 background traffic volumes at the study intersections during the AM and PM peak hours.

## 2026 Background Conditions with Zone Change

The net change in peak hour trips calculated to be potentially generated as a result of the proposed zone change, as described earlier within the *Site Trips* section, were added to the projected year 2026 background traffic volumes to obtain the expected year 2026 site buildout volumes.

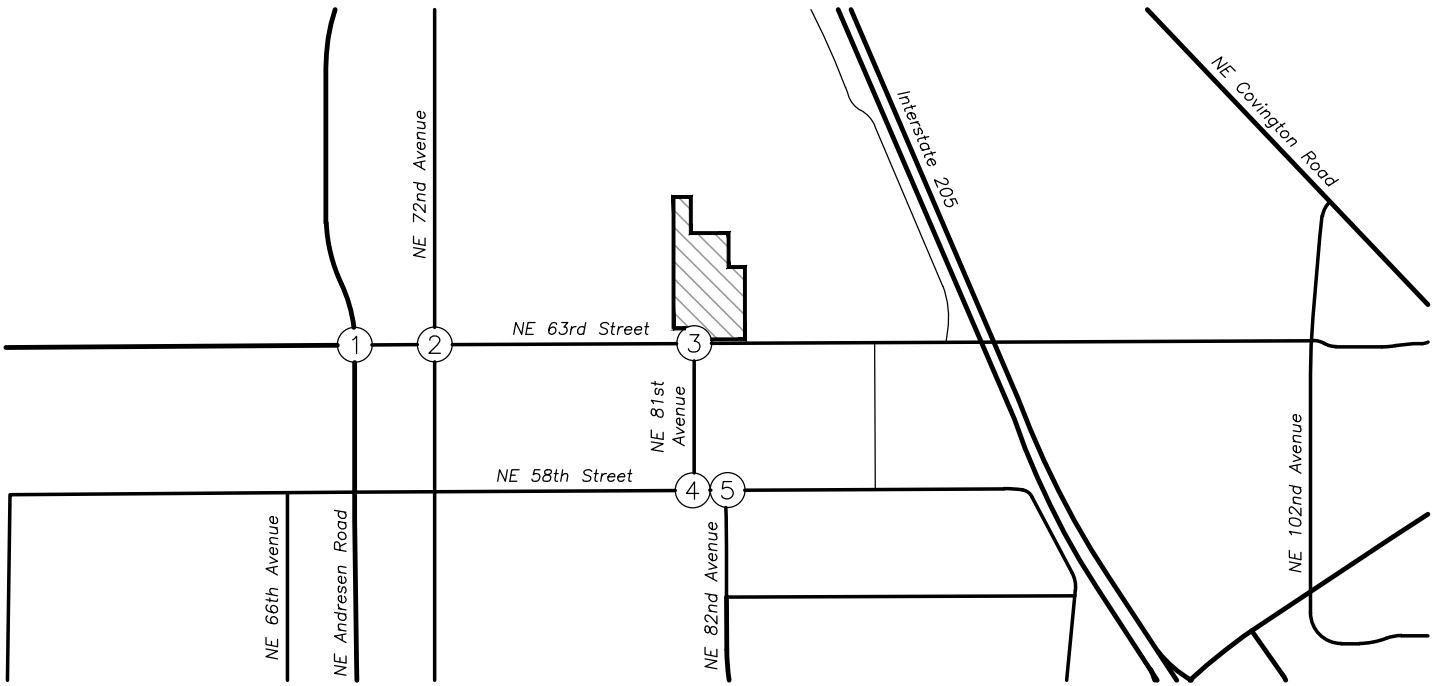
Figure 7 and Figure 8 show the year 2026 background traffic volumes at the study intersections under the existing and proposed zones, respectively, during the AM and PM peak hours.

## 2031 Future Conditions with Zone Change

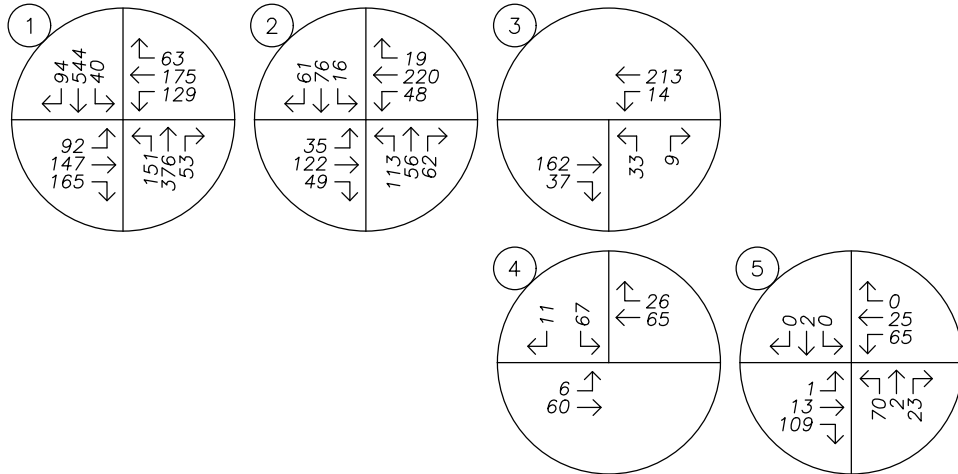
Per the City of Vancouver's Traffic Study Guidelines, an additional future year analysis scenario was prepared which reviews traffic conditions five years beyond the assumed 2026 buildout year of the site. The traffic volumes were estimated in a manner consistent with the methodologies discussed in the aforementioned sections, with the exception that growth rates were applied to the existing year traffic volumes over an eight-year period to estimate 2031 traffic conditions.

Figure 9 and Figure 10 show the year 2031 future traffic volumes at the study intersections under the existing and proposed zones, respectively, during the AM and PM peak hours.

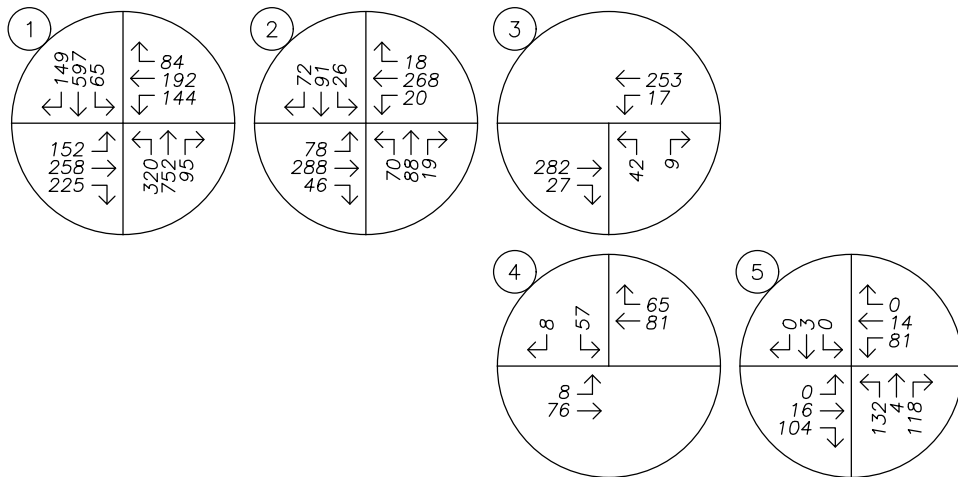




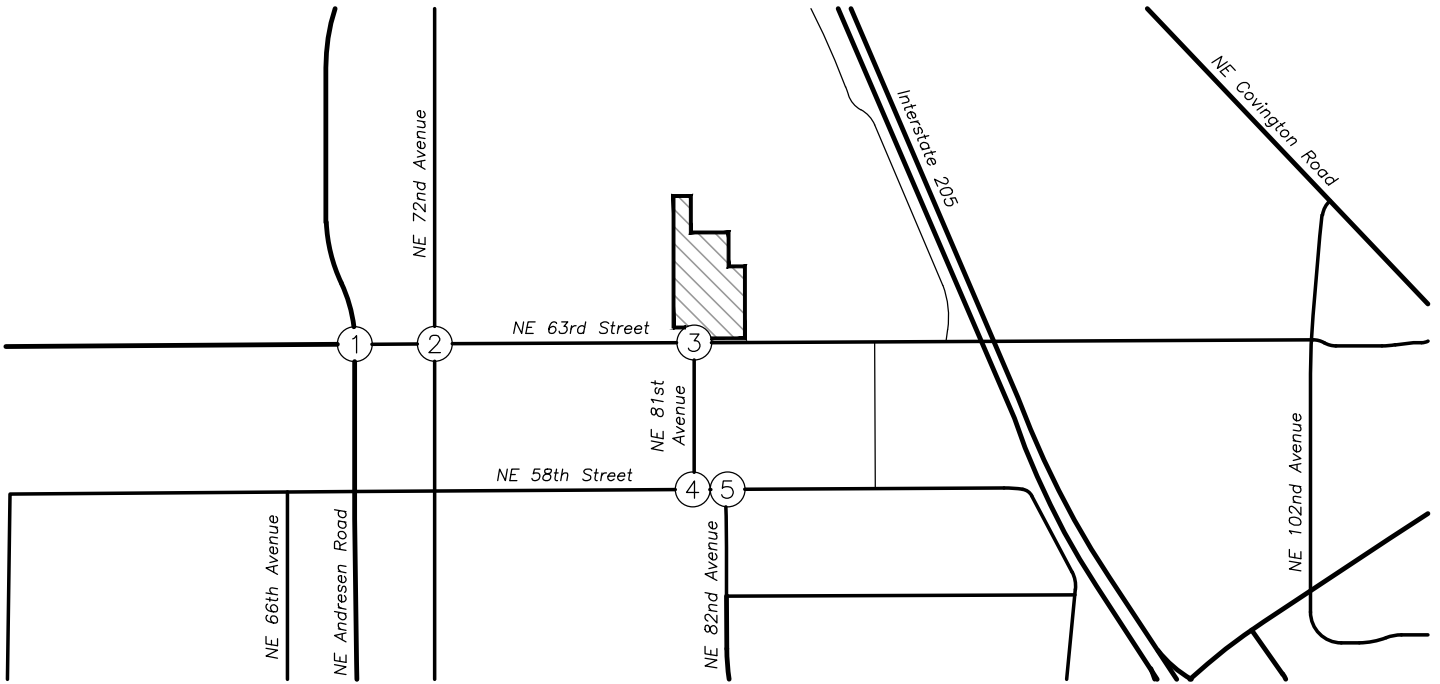
AM PEAK HOUR



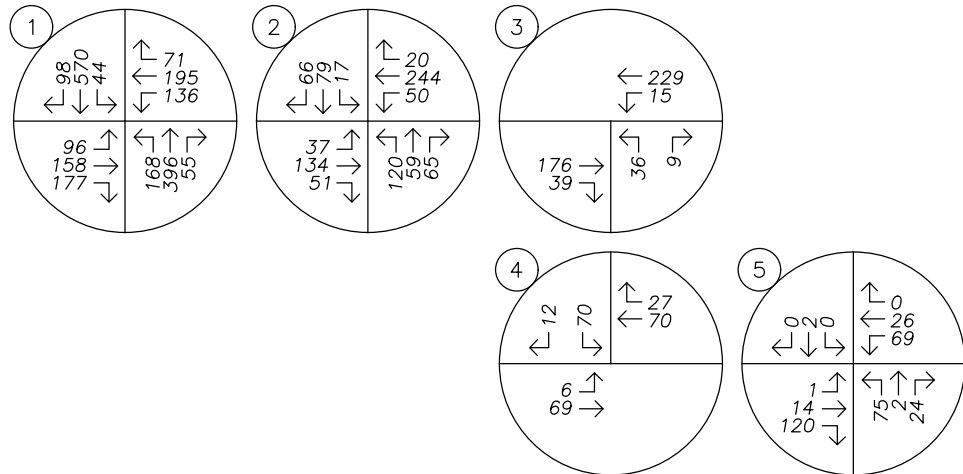
PM PEAK HOUR



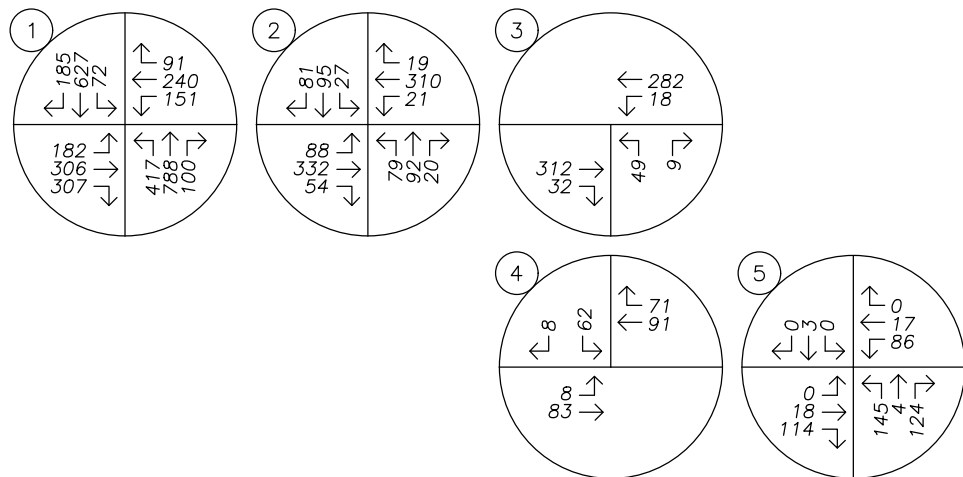
no scale



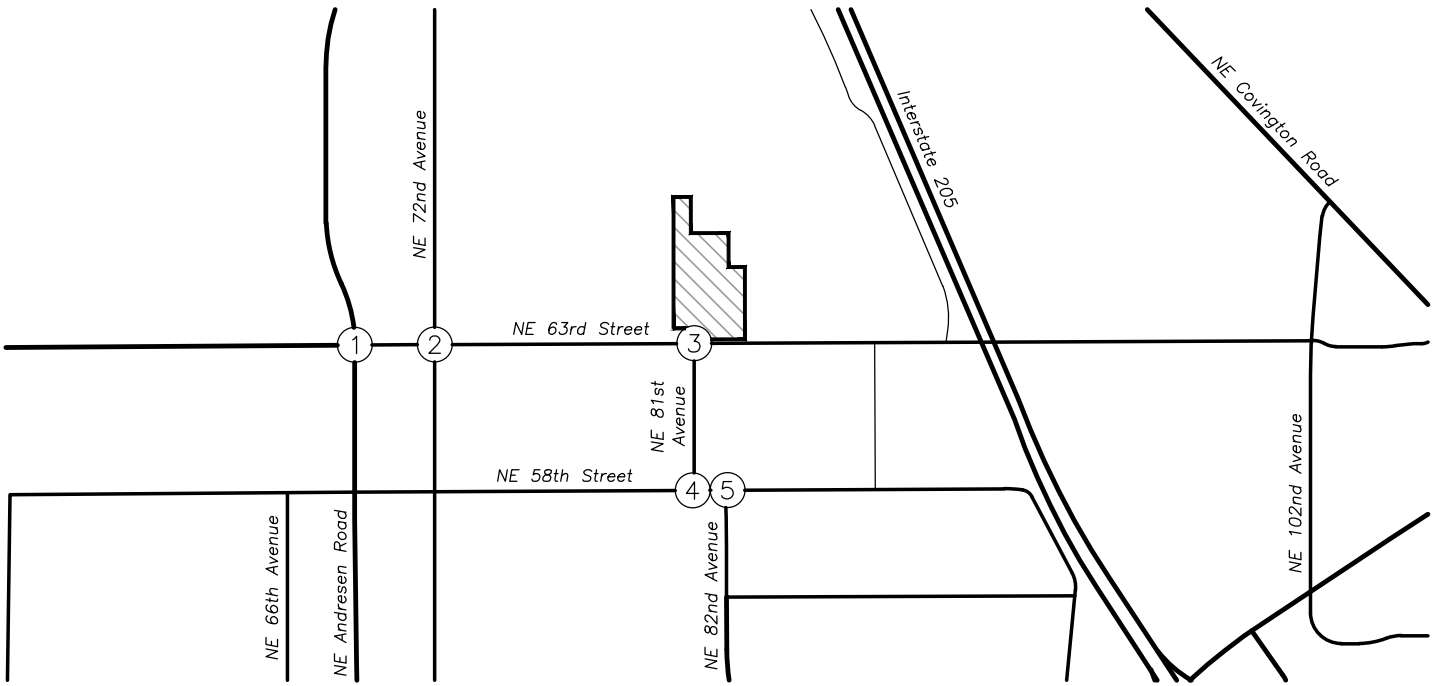
AM PEAK HOUR



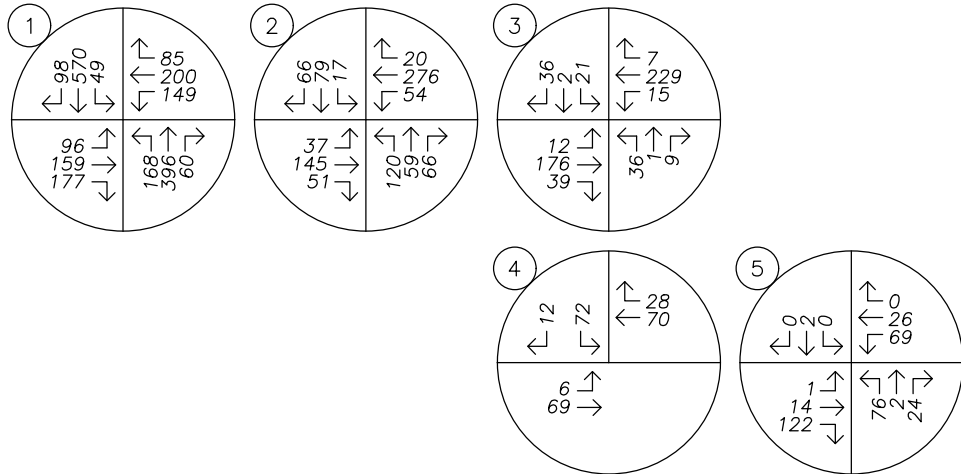
PM PEAK HOUR



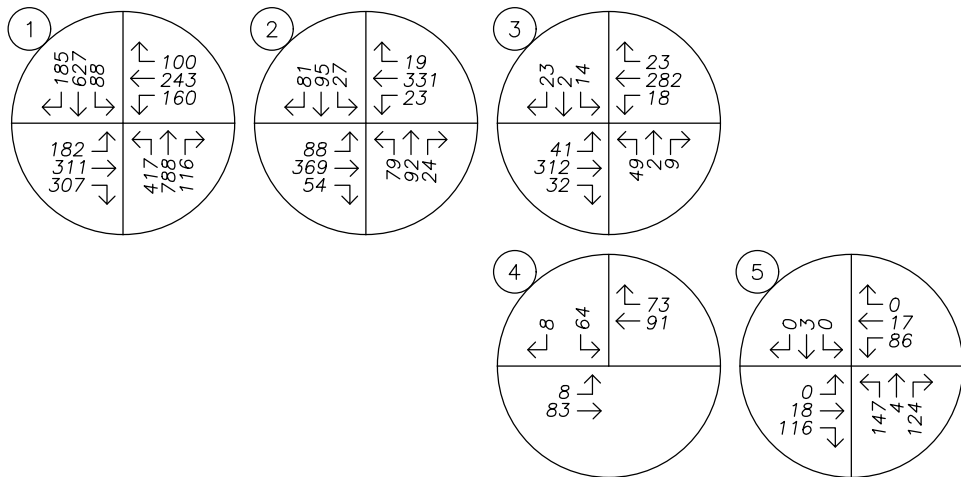
no scale



AM PEAK HOUR



PM PEAK HOUR



no scale

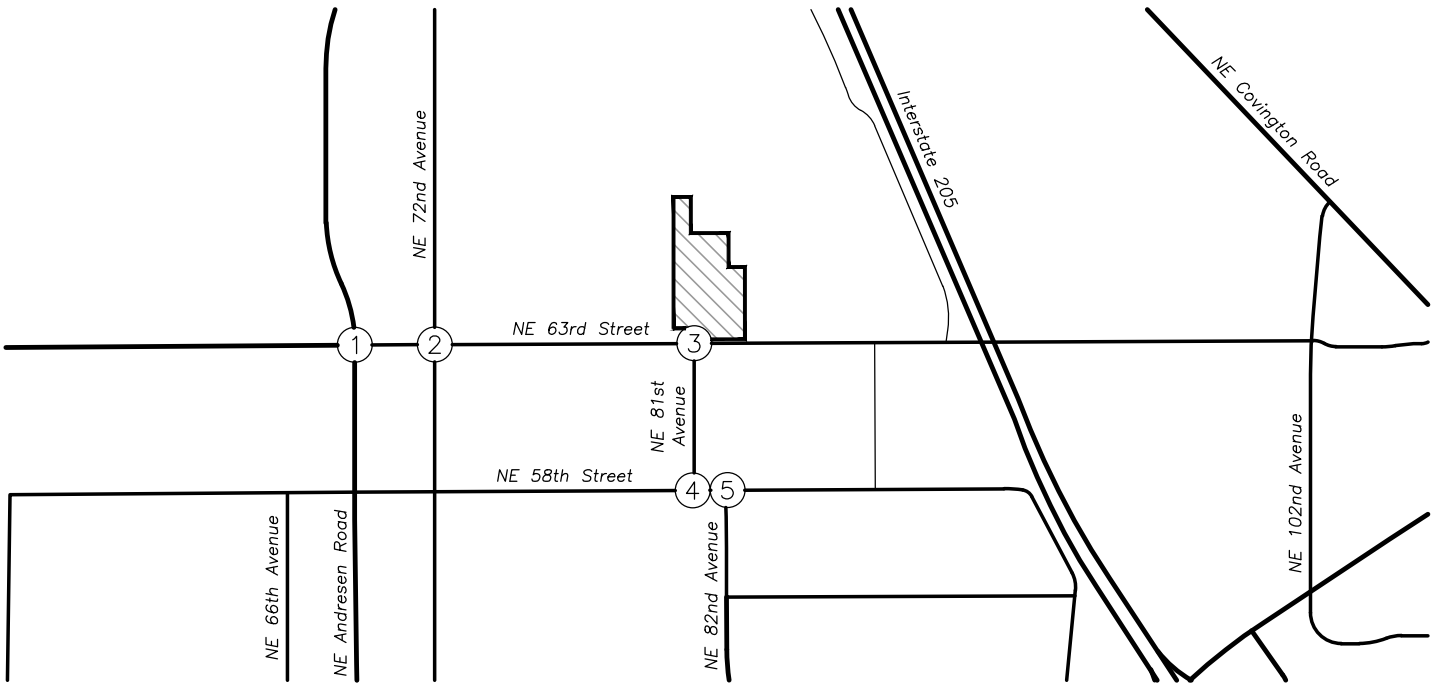
**TRAFFIC VOLUMES**

Year 2026 Background Conditions with Existing Zone  
AM & PM Peak Hours

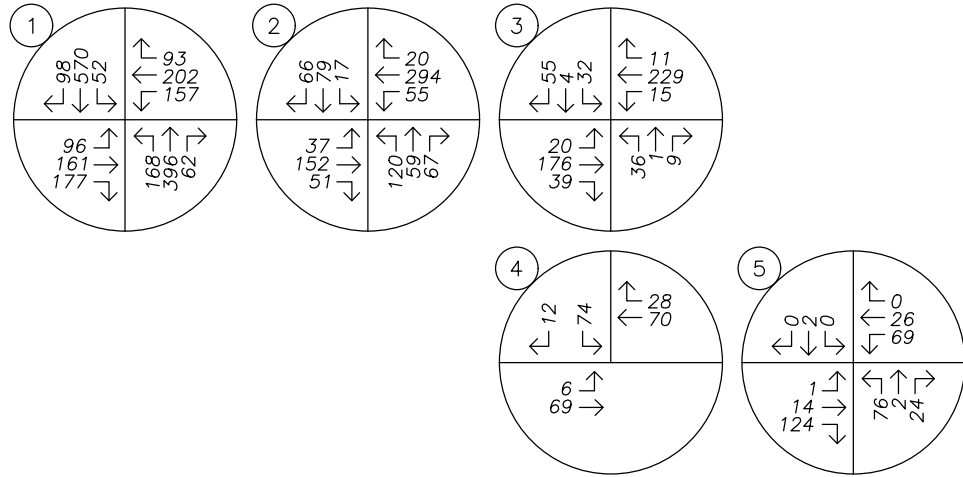
Figure 7

Wood Duck Springs CPA/ZC

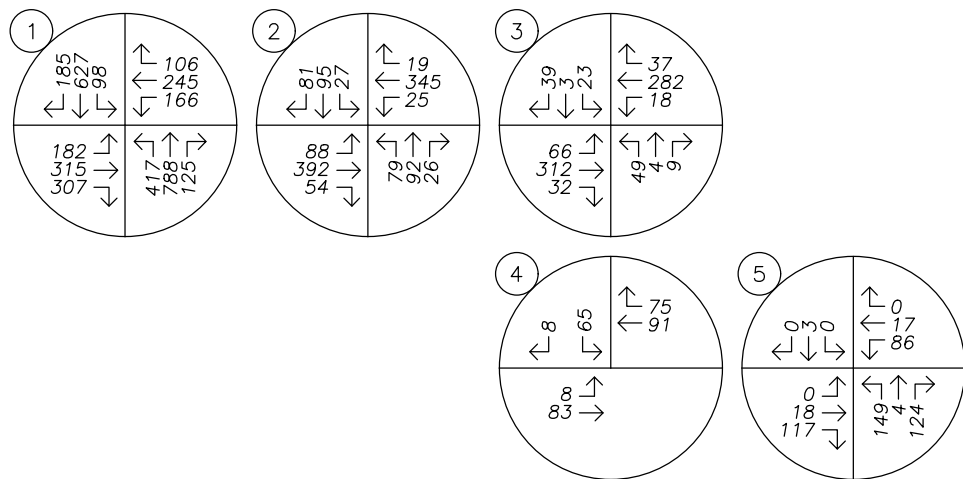
11/12/2023



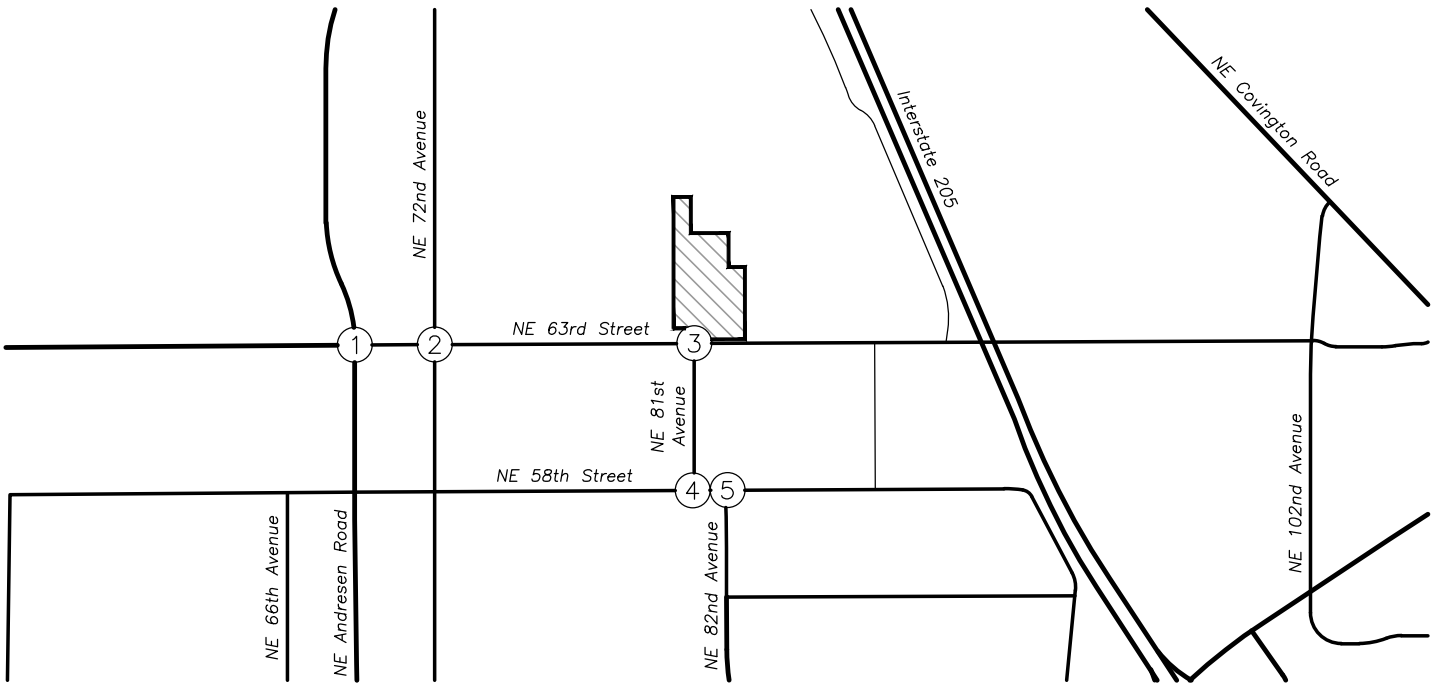
AM PEAK HOUR



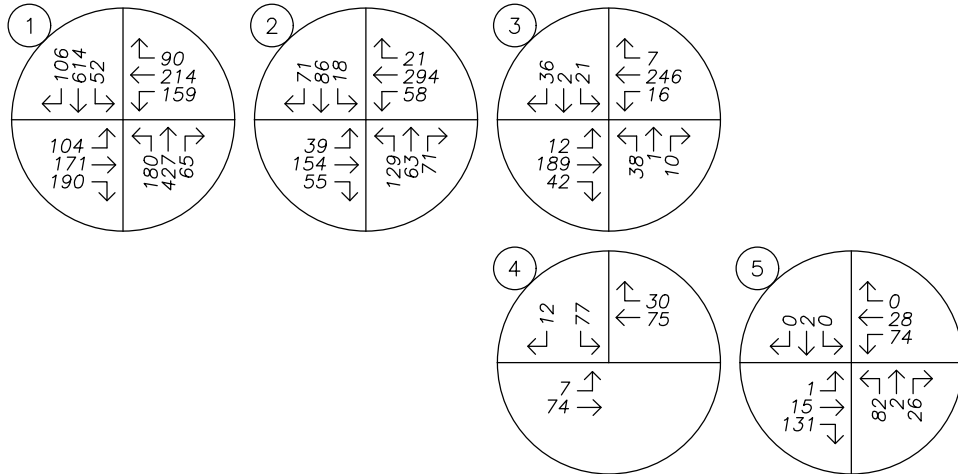
PM PEAK HOUR



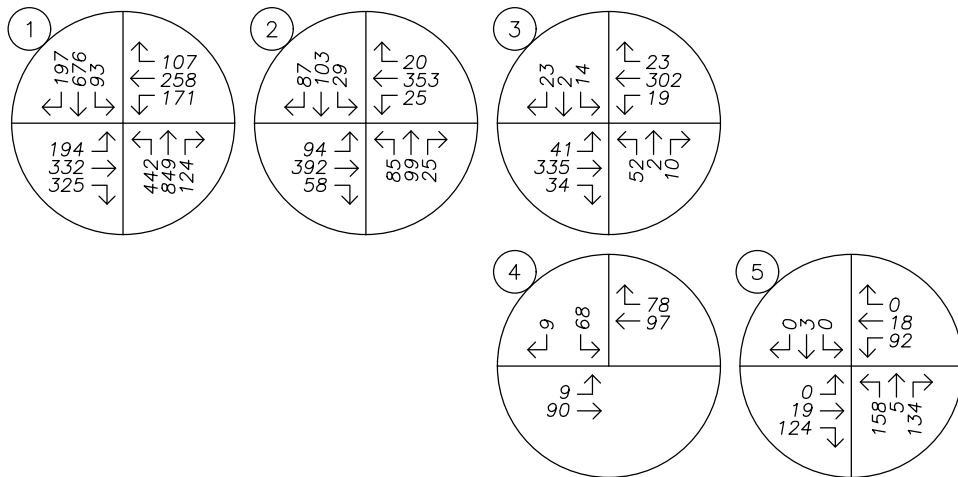
no scale



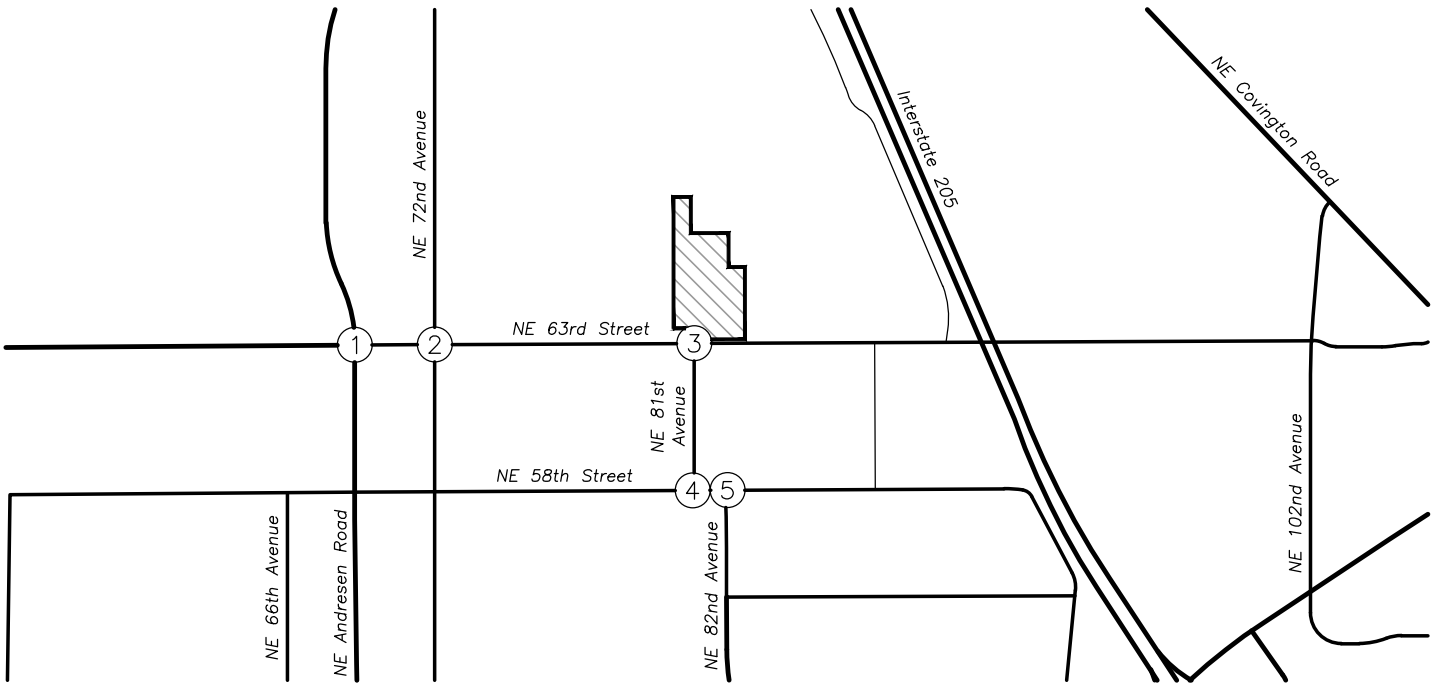
AM PEAK HOUR



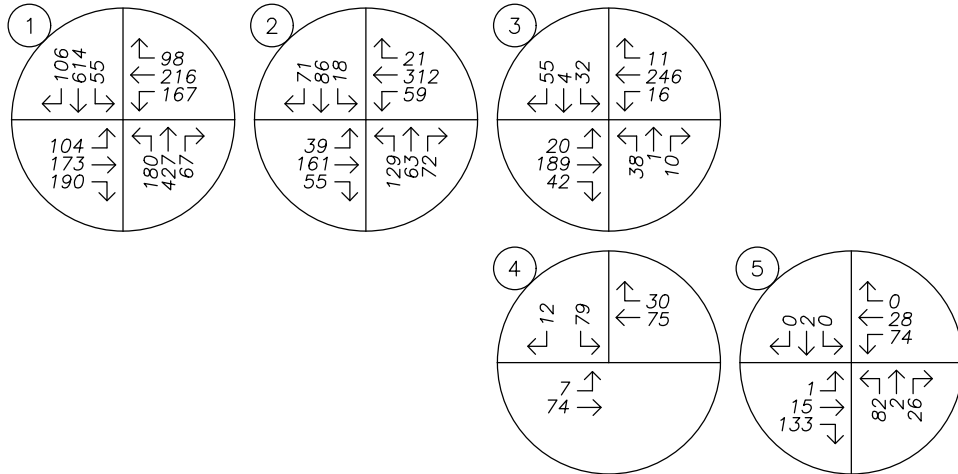
PM PEAK HOUR



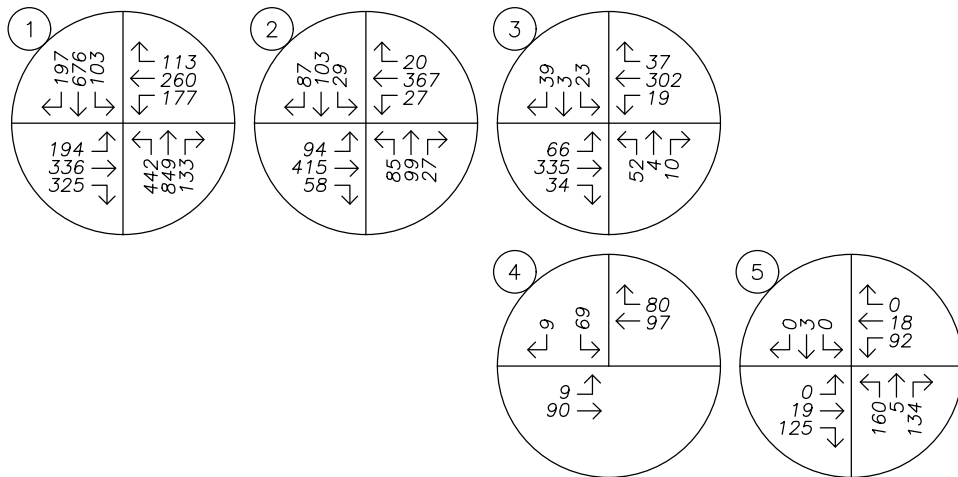
no scale



AM PEAK HOUR



PM PEAK HOUR



no scale

# Safety Analysis

## Crash History Review

Using data obtained from the Washington Department of Transportation (WSDOT) Crash Data and Reporting Branch, a review of the most recent available five years of crash history (January 2018 to December 2022) at the study intersections was performed. The crash data was evaluated based on the number of crashes, the type of collisions, the severity of the collisions, and the resulting crash rate for the intersection.

Crash rates provide the ability to compare safety risks at different intersections by accounting for both the number of crashes that have occurred during the study period and the number of vehicles that typically travel through the intersection. Crash rates were calculated using the common assumption that traffic counted during the PM peak hour represents approximately 10% of the annual average daily traffic (AADT) at the intersection. Crash rates in excess of 1.00 crashes per million entering vehicles (CMEV) may be indicative of design deficiencies and therefore require a need for further investigation and possible mitigation.

With regard to crash severity, WSDOT classifies crashes in the following categories:

- *No Apparent Injury (NA);*
- *Possible Injury (P);*
- *Suspected Minor Injury (SM);*
- *Suspected Serious Injury (SS); and*
- *Fatality or Fatal Injury.*

Table 4 provides a summary of crash types while Table 5 summarizes crash severities and rates for the study intersections. Crash data is included in the technical appendix to this report.

**Table 4: Crash Type Summary**

Number	Intersection	Crash Type							Total
		Rear End	Turn	Angle	Fixed Object	Side swipe	Ped/ Bike	Other	
1	NE 63rd Street at NE Andresen Road	11	1	5	0	0	1	0	18
2	NE 63rd Street at NE 72nd Avenue	3	6	3	1	1	1	0	15
3	NE 63rd Street at NE 81st Avenue	0	0	0	0	0	0	0	0
4	NE 58th Street at NE 81st Avenue	0	0	0	1	0	0	1	2
5	NE 58th Street at NE 82nd Avenue	0	0	0	0	0	0	0	0



Table 5: Crash Severity and Rate Summary

Number	Intersection	Crash Severity					Total Crashes	AADT	Crash Rate
		NA	P	SM	SS	Fatal			
1	NE 63rd Street at NE Andresen Road	13	2	2	1	0	18	30,330	0.33
2	NE 63rd Street at NE 72nd Avenue	10	2	3	0	0	15	10,840	0.76
3	NE 63rd Street at NE 81st Avenue	0	0	0	0	0	0	6,300	0.00
4	NE 58th Street at NE 81st Avenue	2	0	0	0	0	2	2,950	0.37
5	NE 58th Street at NE 82nd Avenue	0	0	0	0	0	0	4,720	0.00

Table Notes: **BOLDED** text indicates a crash rate in excess of 1.00 CMEV.

Per Tables 4 and 5, three of the reported crashes at the study intersections involved a pedestrian/bicyclist or were classified as *Suspected Serious Injury*. The following provides a summary description of these crashes in more detail.

#### NE 63<sup>rd</sup> Street at NE Andresen Road

Two of the reported crashes at the intersection involved a pedestrian or were classified as *Suspected Serious Injury*.

The pedestrian-related crash occurred when the driver of a southbound truck struck a pedestrian who was crossing at the intersection. The crash was coded as indicating the pedestrian failed to yield right-of-way to the traveling vehicle. The crash was classified as *Suspected Minor Injury* where one person involved in the crash sustained injury.

The crash that was classified as *Suspected Serious Injury* occurred when the driver of a southbound passenger car rear-ended another southbound passenger car. The driver who instigated the collision was exceeding a reasonable safe travel speed, noting that roadway conditions were likely slick due to snow/slush. Two people involved in the collision sustained injuries.

#### NE 63<sup>rd</sup> Street at NE 72<sup>nd</sup> Avenue

One of the reported crashes at the intersection involved a pedestrian. The crash occurred when the driver of a westbound left-turning passenger car was inattentive and failed to yield right-of-way to a pedestrian who was crossing at the intersection. The crash was classified as *Suspected Minor Injury* where one person involved in the crash sustained injury.

#### Analysis Summary

Based on a review of available crash data, no significant trends or crash patterns were identified at the study intersections that are indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.





# Sight Distance Evaluation

## Methodology

Sight distances were evaluated at the future planned north leg at the intersection of NE 63<sup>rd</sup> Street at NE 81<sup>st</sup> Avenue. The minimum required intersection sight distance was determined in accordance with the City of Vancouver's Municipal Code Section 11.80.140. These standards state that intersection sight distance measurements must comply with standards established in *A Policy on Geometric Design of Highways and Streets*<sup>2</sup>. According to AASHTO, the driver's eye is assumed to be approximately 15 feet (14.5 feet specifically) from the near edge of the nearest travel lane (or traveled way) of the intersecting street and at a height of 3.5 feet above the minor-street approach pavement. The vehicle driver's eye-height along the major-street approach is assumed to be 3.5 feet above the cross-street pavement.

Per the AASHTO manual, intersection sight distance is an operation measure intended to provide sufficient line of sight along the major-street so that a driver could turn from the minor-street approach without impeding traffic flow. Conversely, stopping sight distance is considered the minimum requirement to ensure safe operation of an intersection. This is the distance that allows an oncoming driver to see a hazard on the roadway, react, and come to a complete stop, if necessary, to avoid a collision.

## Field Measurements

Based on a posted speed of 35 mph along NE 63<sup>rd</sup> Street, the minimum recommended intersection sight distances to allow for safe and efficient operation of the intersection is 415 feet to the west for southbound left-turning vehicles (when considering the need to cross one additional travel lane) and 335 feet to the east for southbound right-turning vehicles. In both directions, sight distances were measured to be in excess of 450 feet.

## Analysis Findings

Based on the analysis, adequate intersection sight distances are available at the site access approach at the intersection of NE 63<sup>rd</sup> Street at NE 81<sup>st</sup> Avenue to allow for safe and efficient operation of the intersection. No mitigation is necessary or recommended at the intersection with respect to intersection sight distance.

---

<sup>2</sup> American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets*, 7th Edition, 2018.

## Warrants Analysis

Left-turn lane and preliminary traffic signal warrants were examined for the study intersections where such treatments would be applicable.

### **Left-Turn Lane Warrants**

A left-turn refuge lane is primarily a safety consideration for the major-street of unsignalized, minor-street stop-controlled intersections, removing left-turning vehicles from the through traffic stream. Two methods for evaluating left-turn lane warrants were utilized:

- Left-turn lane warrants developed by the Transportation Research Board (TRB) from the *National Cooperative Highway Research Project's (NCHRP) Report 457*.
- Section 1310.02(13)(a) *One-Way Left-Turn Lanes* and Exhibit 1310-9 *Left-Turn Storage Guidelines: Two-Lane, Unsignalized* from the WSDOT Design Manual.

Turn lane warrants were evaluated based on the number of advancing vehicles, the number of turning vehicles, the travel speed, and the number of through lanes.

Per the NCHRP and WSDOT methodologies, left turn lane warrants are projected to be met at the eastbound approach at the intersection of NE 63<sup>rd</sup> Street at NE 81<sup>st</sup> Avenue under year 2026 conditions with the proposed zone change implemented. To accommodate this left-turn lane the existing median on the west intersection leg can be re-striped accordingly. Left-turn lane warrants are not projected to be met at any of the other study intersections. No other new left-turn lanes are necessary or recommended at these study intersections.

### **Preliminary Traffic Signal Warrants**

Preliminary traffic signal warrants were examined for the unsignalized study intersections to determine whether the installation of a new traffic signal will be warranted at the intersections under future year 2031 conditions. Based on the preliminary analysis following a review of Warrant 1 in the *Manual on Uniform Traffic Control Devices*, or MUTCD, traffic signal warrants are not projected to be met at the unsignalized study intersections under year 2031 conditions with the zone change implemented. Therefore, no new traffic signals are necessary or recommended as part of the proposed comprehensive plan amendment/zone map change application.



# Operational Analysis

## Intersection Capacity Analysis

A capacity and delay analysis were conducted for the study intersections per the signalized and unsignalized intersection analysis methodologies in the *Highway Capacity Manual* (HCM)<sup>3</sup>. Intersections are generally evaluated based on the average control delay experienced by vehicles and are assigned a grade according to their operation. The level of service (LOS) of an intersection can range from LOS A, which indicates very little or no delay experienced by vehicles, to LOS F, which indicates a high degree of congestion and delay. The volume-to-capacity (v/c) ratio is a measure that compares the traffic volumes (demand) against the available capacity of an intersection.

### Performance Standards

According to City of Vancouver Municipal Code section 11.80.130 *Traffic Impact Analysis*, the City's performance standards include the following:

- B. A proposed development that adds at least five net new peak hour trips to an intersection approach operating at an LOS E or lower within the required traffic impact analysis area may be denied based upon any of the following:*
- 1. For signalized intersections, when off-site intersection conditions are at a LOS F, or*
  - 2. For signalized intersections, when the LOS E and the volume to capacity ratio is greater than 0.95, or*
  - 3. For unsignalized intersections, when the volume to capacity ratio for any lane on any approach is greater than 0.95, or*
  - 4. When significant traffic hazards would be caused or materially aggravated by the proposed development, or*
  - 5. Notwithstanding "a" through "d" of this subsection, traffic impacts to intersections on corridors built to ultimate capacity will be evaluated against the LOS standards identified in an adopted Corridor Management Plan.*

### Delay & Capacity Analysis

The study intersections were analyzed utilizing methodologies and parameters detailed in the *WSDOT Synchro & SimTraffic Protocol*<sup>4</sup> document. Of specific note, the following peak hour factors (PHF) were incorporated in the analysis models:

- For existing year conditions, a PHF of no less than 0.80 was applied to each study intersection.
- For future year conditions, for study intersections where count data recorded a PHF of 0.90 or greater, the PHF was increased to 1.0. Where count data recorded a PHF of 0.89 or less the PHF was increased to 0.92.

---

<sup>3</sup> Transportation Research Board, *Highway Capacity Manual 6<sup>th</sup> Edition*, 2016.

<sup>4</sup> [WSDOT Synchro & SimTraffic Protocol \(wa.gov\)](https://www.wa.gov)



- To avoid showing a future year scenario with lower delays or v/c ratios than under existing conditions, when necessary the PHF for intersections under the existing year scenario was increased to 0.92.

The LOS, delay, and v/c results of the capacity analysis are shown in Table 6 for the AM and PM peak hours. Note the TrafficWare Synchro software utilized for analysis does not report the overall v/c ratio of signalized intersections in the HCM 6<sup>th</sup> Edition capacity reports. Therefore, the signalized intersection v/c ratios were calculated utilizing HCM 2000 methodologies. Detailed calculations as well as tables showing the relationship between delay and LOS are included in the appendix to this report.

**Table 6: Intersection Capacity Analysis Summary**

Analysis Scenario	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
<b>1. NE 63rd Street at NE Andresen Road</b>						
2023 Existing Conditions	C	32	0.56	D	42	0.75
2026 Background Conditions	C	34	0.60	D	45	0.84
2026 Background Conditions (Existing Zone)	C	34	0.61	D	45	0.84
2026 Background Conditions (Proposed Zone)	C	34	0.61	D	46	0.85
2031 Future Conditions (Existing Zone)	D	35	0.66	D	51	0.91
2031 Future Conditions (Proposed Zone)	D	37	0.66	D	52	0.91
<b>2. NE 63rd Street at NE 72nd Avenue</b>						
2023 Existing Conditions	B	13	0.32	B	11	0.32
2026 Background Conditions	B	13	0.35	B	11	0.34
2026 Background Conditions (Existing Zone)	B	12	0.38	B	11	0.35
2026 Background Conditions (Proposed Zone)	B	12	0.39	B	11	0.37
2031 Future Conditions (Existing Zone)	B	13	0.41	B	11	0.38
2031 Future Conditions (Proposed Zone)	B	13	0.43	B	11	0.40
<b>3. NE 63rd Street at NE 81st Avenue</b>						
2023 Existing Conditions	B	12	0.08	B	13	0.10
2026 Background Conditions	B	12	0.09	B	14	0.13
2026 Background Conditions (Existing Zone)	B	14	0.11	C	18	0.18
2026 Background Conditions (Proposed Zone)	B	15	0.17	C	21	0.21
2031 Future Conditions (Existing Zone)	B	15	0.12	C	20	0.21
2031 Future Conditions (Proposed Zone)	C	15	0.18	C	23	0.25

Table Notes: **BOLDED** text indicates intersection operation above jurisdictional standards.



Table 6: Intersection Capacity Analysis Summary (Continued)

Analysis Scenario	AM Peak Hour			PM Peak Hour		
	LOS	Delay (s)	v/c	LOS	Delay (s)	v/c
<b>4. NE 58th Street at NE 81st Avenue</b>						
2023 Existing Conditions	B	10	0.10	B	10	0.09
2026 Background Conditions	B	10	0.11	B	10	0.10
2026 Background Conditions (Existing Zone)	B	10	0.11	B	10	0.11
2026 Background Conditions (Proposed Zone)	B	10	0.12	B	10	0.11
2031 Future Conditions (Existing Zone)	B	10	0.12	B	11	0.11
2031 Future Conditions (Proposed Zone)	B	10	0.12	B	11	0.12
<b>5. NE 58th Street at NE 82nd Avenue</b>						
2023 Existing Conditions	B	12	0.14	B	12	0.36
2026 Background Conditions	B	12	0.16	B	13	0.40
2026 Background Conditions (Existing Zone)	B	12	0.16	B	13	0.40
2026 Background Conditions (Proposed Zone)	B	13	0.16	B	13	0.41
2031 Future Conditions (Existing Zone)	B	13	0.17	B	14	0.45
2031 Future Conditions (Proposed Zone)	B	13	0.18	B	14	0.45

Table Notes: **BOLDED** text indicates intersection operation above jurisdictional standards.

Based on the results of the operational analysis, all study intersections are currently operating acceptably per City of Vancouver standards and are projected to continue operating acceptably through year 2031, approximately five years beyond an assumed buildout year of the site following approval of the proposed zone change. Accordingly, no operational mitigation is necessary or recommended at the study intersections.



## Conclusions

No significant trends or crash patterns were identified at the study intersections that are indicative of safety concerns. Accordingly, no safety mitigation is recommended per the crash data analysis.

Adequate intersection sight distances are available at the site access approach at the intersection of NE 63<sup>rd</sup> Street at NE 81<sup>st</sup> Avenue to allow for safe and efficient operation of the intersection. No mitigation is necessary or recommended at the intersection with respect to intersection sight distance.

Left turn lane warrants are projected to be met at the eastbound approach at the intersection of NE 63<sup>rd</sup> Street at NE 81<sup>st</sup> Avenue under year 2026 conditions with the proposed zone change implemented. To accommodate this left-turn lane the existing median on the west intersection leg can be re-stripped accordingly. Left-turn lane warrants are not projected to be met at any of the other study intersections. No other new left-turn lanes are necessary or recommended at these study intersections.

Traffic signal warrants are not projected to be met at the unsignalized study intersections under year 2031 conditions with the zone change implemented. Therefore, no new traffic signals are necessary or recommended as part of the proposed comprehensive plan/zone map change application.

All study intersections are currently operating acceptably per City of Vancouver standards and are projected to continue operating acceptably through year 2031, approximately five years beyond an assumed buildout year of the site following approval of the proposed zone change. Accordingly, no operational mitigation is necessary or recommended at the study intersections.

## Appendix A – Trip Generation and Distribution

Trip Generation

RTC Data





### TRIP GENERATION CALCULATIONS

Source: Trip Generation Manual, 11th Edition

Existing Low Density R-9 Zone

Land Use: Single-Family Detached Housing

Land Use Code: 210

Land Use Subcategory: All Sites

Setting/Location: General Urban/Suburban

Variable: Dwelling Units

Trip Type: Vehicle

Formula Type: Rate

Variable Quantity: **105**

#### AM PEAK HOUR

Trip Rate: 0.75

	Enter	Exit	Total
Directional Split	25%	75%	
Trip Ends	20	59	79

#### PM PEAK HOUR

Trip Rate: 1.00

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	66	39	105

#### WEEKDAY

Trip Rate: 10.00

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	525	525	1,050

#### SATURDAY

Trip Rate: 9.48

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	498	498	996

Source: Trip Generation Manual, 11th Edition & City of Vancouver Policy





### TRIP GENERATION CALCULATIONS

Source: Trip Generation Manual, 11th Edition

Proposed High Density R-22 Zone

Land Use: Multifamily Housing (Low-Rise)

Land Use Code: 220

Land Use Subcategory: Not Close to Rail Transit

Setting/Location: General Urban/Suburban

Variable: Dwelling Units

Trip Type: Vehicle

Formula Type: Rate

Variable Quantity: **283**

#### AM PEAK HOUR

Trip Rate: 0.4

	Enter	Exit	Total
Directional Split	24%	76%	
Trip Ends	27	86	113

#### PM PEAK HOUR

Trip Rate: 0.51

	Enter	Exit	Total
Directional Split	63%	37%	
Trip Ends	91	53	144

#### WEEKDAY

Trip Rate: 6.74

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	954	954	1,908

#### SATURDAY

Trip Rate: 4.55

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	644	644	1,288

Caution: Small Sample Size

Source: Trip Generation Manual, 11th Edition



TRIP GENERATION CALCULATIONS  
Source: Trip Generation Manual, 11th Edition  
Proposed Commercial and Mixed Use CC Zone

*Land Use:* Health/Fitness Club  
*Land Use Code:* 492  
*Land Use Subcategory:* All Sites  
*Setting/Location:* General Urban/Suburban  
*Variable:* 1000 SF GFA  
*Trip Type:* Vehicle  
*Variable Quantity:* **8**

**AM PEAK HOUR**

*Trip Rate:* 1.31

	Enter	Exit	Total
Directional Split	51%	49%	
Trip Ends	<b>5</b>	<b>5</b>	<b>10</b>

**PM PEAK HOUR**

*Trip Rate:* 3.45

	Enter	Exit	Total
Directional Split	57%	43%	
Trip Ends	<b>16</b>	<b>12</b>	<b>28</b>

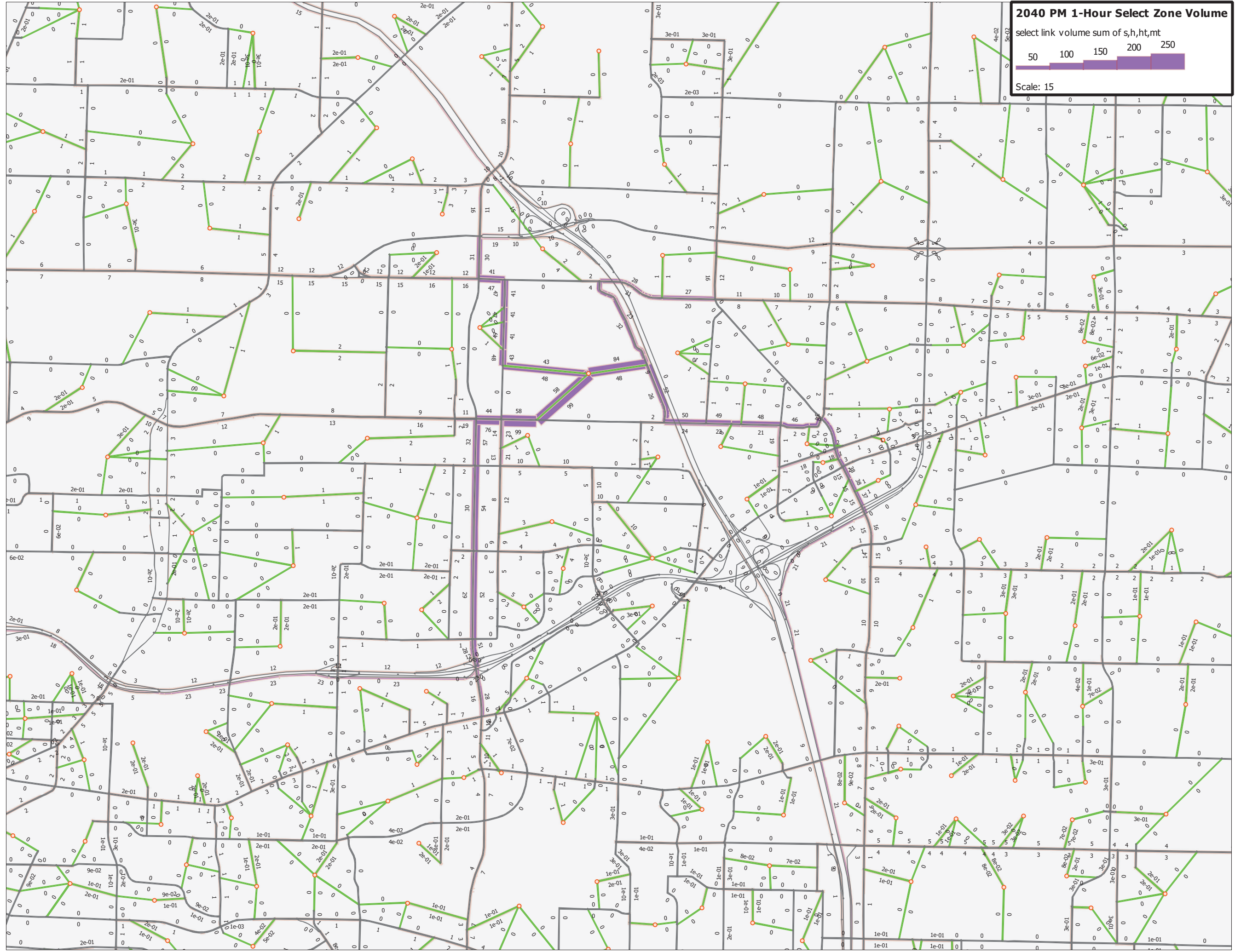
**WEEKDAY**

*Trip Rate:* 34.5

	Enter	Exit	Total
Directional Split	50%	50%	
Trip Ends	<b>138</b>	<b>138</b>	<b>276</b>

*Assumed to be 10 times the PM Peak Hour*

**2040 PM 1-Hour Select Zone Volume**  
 select link volume sum of s,h,ht,mt  
 50 100 150 200 250  
 Scale: 15



## Appendix B – Traffic Volumes

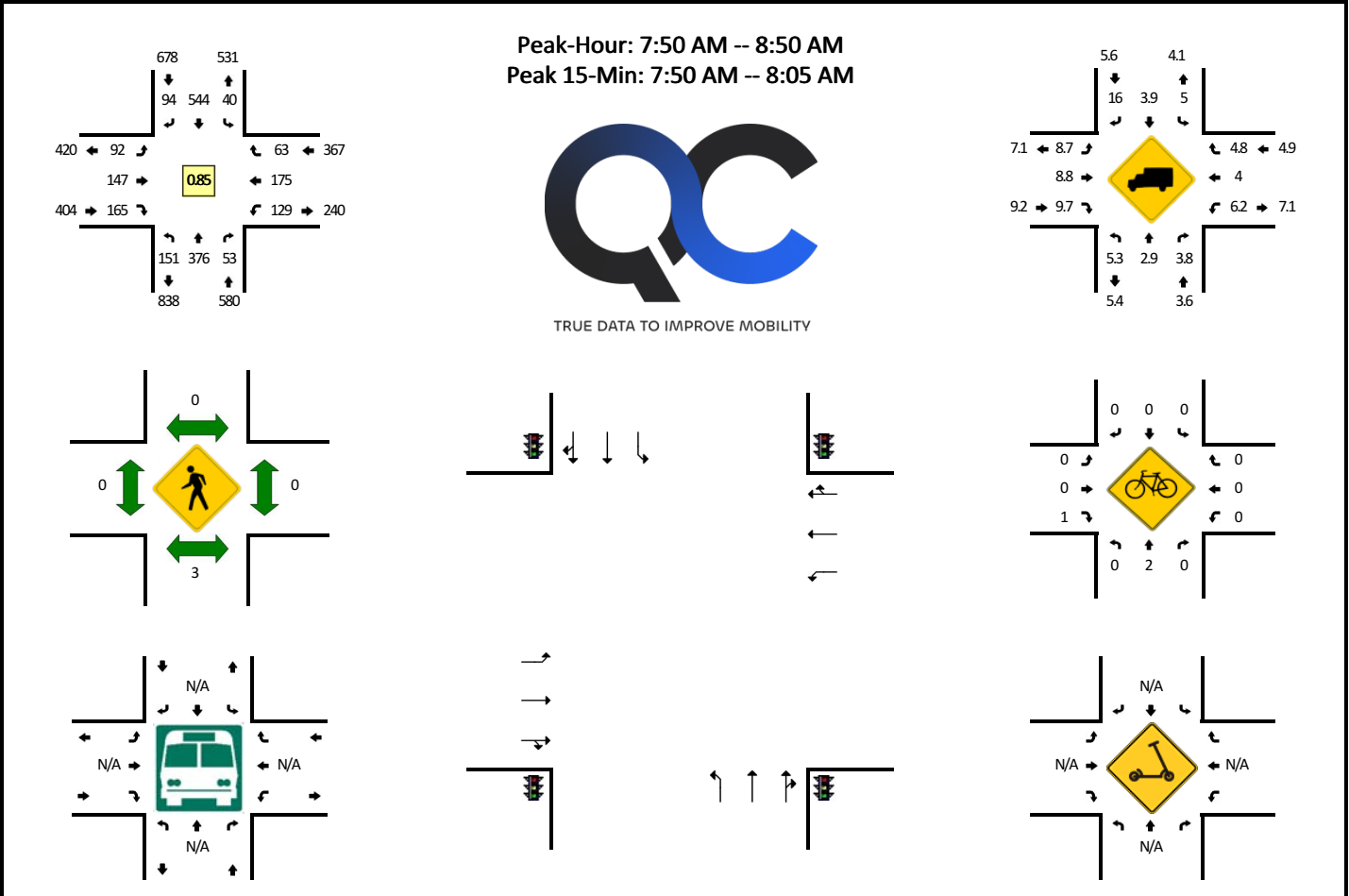
Traffic Counts

In-Process Data



**LOCATION:** NE Andresen Rd -- NE 63rd St  
**CITY/STATE:** Minnehaha, WA

**QC JOB #:** 16335701  
**DATE:** Thu, Sep 21 2023

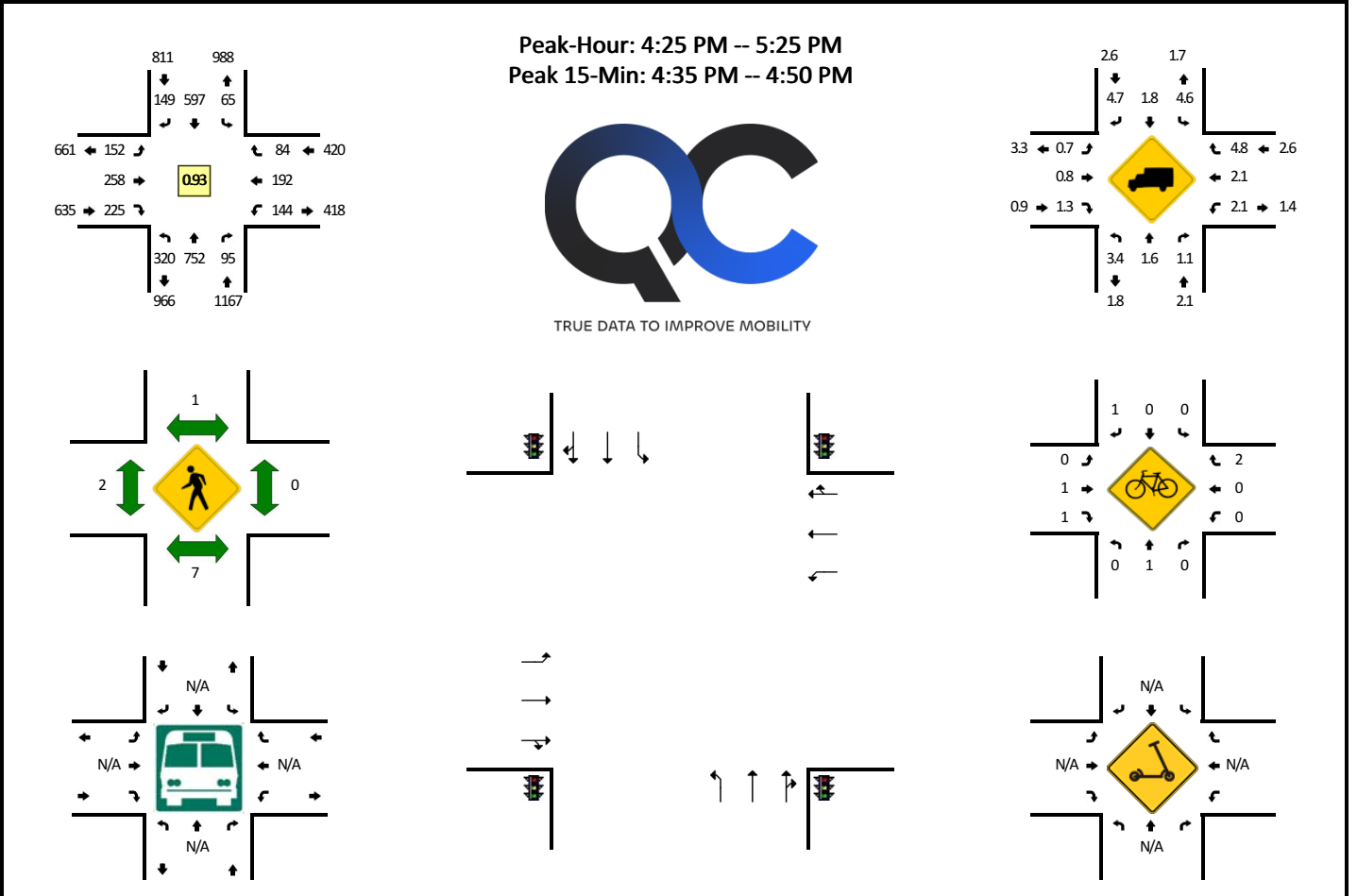


5-Min Count Period Beginning At	NE Andresen Rd (Northbound)				NE Andresen Rd (Southbound)				NE 63rd St (Eastbound)				NE 63rd St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	8	22	4	0	4	23	1	0	2	8	7	0	6	17	4	0	106	
7:05 AM	3	16	1	0	2	26	5	0	5	12	12	0	10	12	2	0	106	
7:10 AM	15	19	5	0	0	28	2	0	7	7	14	0	2	10	8	0	117	
7:15 AM	5	27	2	0	1	32	6	0	6	7	8	0	11	13	3	0	121	
7:20 AM	13	24	5	0	3	25	6	0	4	8	10	0	9	10	5	0	122	
7:25 AM	12	15	3	0	1	30	4	0	5	10	11	0	8	16	7	0	122	
7:30 AM	6	22	1	0	2	34	2	0	6	8	9	0	13	9	4	0	116	
7:35 AM	6	36	1	0	3	37	9	0	6	9	12	0	12	9	9	0	149	
7:40 AM	11	23	5	0	3	43	3	0	10	10	13	0	11	23	2	0	157	
7:45 AM	9	40	2	0	6	45	9	0	4	3	9	0	7	19	5	0	158	
7:50 AM	16	41	3	0	4	57	17	0	11	14	24	0	10	24	10	0	231	
7:55 AM	13	28	5	0	5	49	6	0	7	16	12	0	14	15	7	0	177	1682
8:00 AM	14	36	8	0	3	57	4	0	6	14	8	0	17	17	8	0	192	1768
8:05 AM	8	31	2	0	1	49	9	0	9	11	14	0	16	12	6	0	168	1830
8:10 AM	20	36	6	0	3	31	5	0	10	12	9	0	9	20	3	0	164	1877
8:15 AM	9	31	5	0	4	44	8	0	10	12	14	0	13	17	3	0	170	1926
8:20 AM	4	21	4	0	1	39	7	0	8	13	7	0	2	19	6	0	131	1935
8:25 AM	21	28	3	0	4	29	13	0	4	12	13	0	6	10	1	0	144	1957
8:30 AM	12	25	4	0	5	39	5	0	2	11	8	0	7	7	5	0	130	1971
8:35 AM	3	29	5	0	4	37	4	0	10	9	16	0	13	11	6	0	147	1969
8:40 AM	17	37	5	0	3	51	8	0	5	10	20	0	12	14	3	0	185	1997
8:45 AM	14	33	3	0	3	62	8	0	10	13	20	0	10	9	5	0	190	2029
8:50 AM	10	34	5	0	0	35	3	0	10	10	19	0	7	10	4	0	147	1945
8:55 AM	11	23	3	0	2	34	17	0	6	14	4	0	7	17	6	0	144	1912
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	172	420	64	0	48	652	108	0	96	176	176	0	164	224	100	0	2400	
Heavy Trucks	0	8	0		8	24	12		0	4	16		16	8	12		108	
Buses																		
Pedestrians		8				0				0				0			8	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scooters																		

*Comments:*

**LOCATION:** NE Andresen Rd -- NE 63rd St  
**CITY/STATE:** Minnehaha, WA

**QC JOB #:** 16335702  
**DATE:** Thu, Sep 21 2023



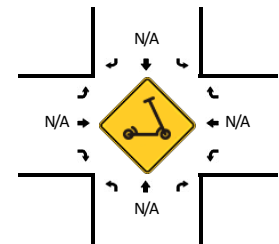
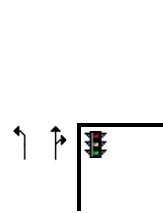
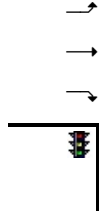
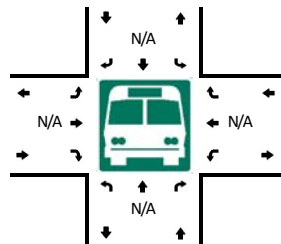
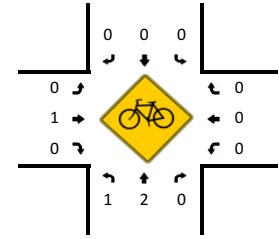
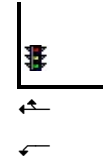
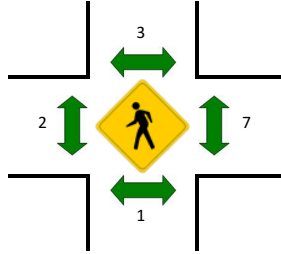
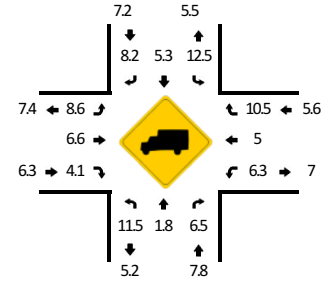
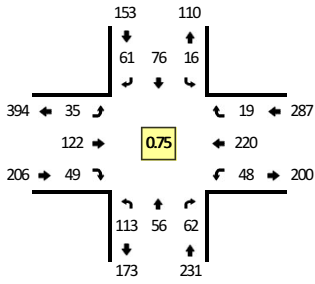
5-Min Count Period Beginning At	NE Andresen Rd (Northbound)				NE Andresen Rd (Southbound)				NE 63rd St (Eastbound)				NE 63rd St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	16	67	7	0	4	50	7	0	15	19	30	0	8	10	6	0	239	
4:05 PM	30	61	8	0	7	43	7	0	19	33	24	0	5	17	6	0	260	
4:10 PM	30	69	6	0	2	37	8	0	9	18	21	0	11	19	6	0	236	
4:15 PM	20	66	7	0	4	52	20	0	15	20	20	0	10	14	2	0	250	
4:20 PM	18	53	8	0	2	41	13	0	8	27	11	0	14	26	3	0	224	
4:25 PM	23	50	6	0	6	32	13	0	16	23	25	0	9	14	4	0	221	
4:30 PM	36	67	9	0	9	57	10	0	4	20	22	0	11	13	2	0	260	
4:35 PM	24	65	6	0	4	46	17	0	12	18	16	0	19	23	10	0	260	
4:40 PM	30	73	7	0	6	44	16	0	18	24	19	0	17	12	8	0	274	
4:45 PM	42	73	13	0	7	52	14	0	6	18	24	0	9	16	5	0	279	
4:50 PM	18	58	8	0	4	56	14	0	10	26	21	0	9	22	2	0	248	
4:55 PM	24	54	7	0	8	44	15	0	18	26	19	0	14	12	7	0	248	2999
5:00 PM	40	69	5	0	4	40	11	0	21	20	15	0	13	20	13	0	271	3031
5:05 PM	19	75	7	0	5	65	6	0	12	21	12	0	13	14	12	0	261	3032
5:10 PM	20	58	8	0	4	42	6	0	17	23	14	0	13	19	8	0	232	3028
5:15 PM	24	45	10	0	3	60	11	0	10	21	22	0	10	14	7	0	237	3015
5:20 PM	20	65	9	0	5	59	16	0	8	18	16	0	7	13	6	0	242	3033
5:25 PM	15	45	4	0	1	39	5	0	8	17	14	0	15	20	6	0	189	3001
5:30 PM	24	70	3	0	5	41	11	0	11	22	18	0	10	12	4	0	231	2972
5:35 PM	26	46	10	0	4	56	12	0	14	15	23	0	6	13	5	0	230	2942
5:40 PM	17	49	7	0	3	43	11	0	14	24	21	0	18	28	8	0	243	2911
5:45 PM	27	41	15	0	9	39	10	0	12	23	14	0	7	31	2	0	230	2862
5:50 PM	21	61	6	0	4	43	6	0	11	27	21	0	3	6	4	0	213	2827
5:55 PM	26	67	7	0	3	63	18	0	8	13	14	0	7	11	3	0	240	2819
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	384	844	104	0	68	568	188	0	144	240	236	0	180	204	92	0	3252	
Heavy Trucks	8	16	0		4	12	4		0	4	4		4	4	0		60	
Buses																		
Pedestrians		4				4				4				0			12	
Bicycles	0	0	0		0	0	0		0	0	4		0	0	0		4	
Scoters																		

Comments:

**LOCATION:** NE 72nd Ave -- NE 63rd St  
**CITY/STATE:** Vancouver, WA

**QC JOB #:** 16335703  
**DATE:** Thu, Sep 21 2023

**Peak-Hour: 7:25 AM -- 8:25 AM**  
**Peak 15-Min: 7:50 AM -- 8:05 AM**

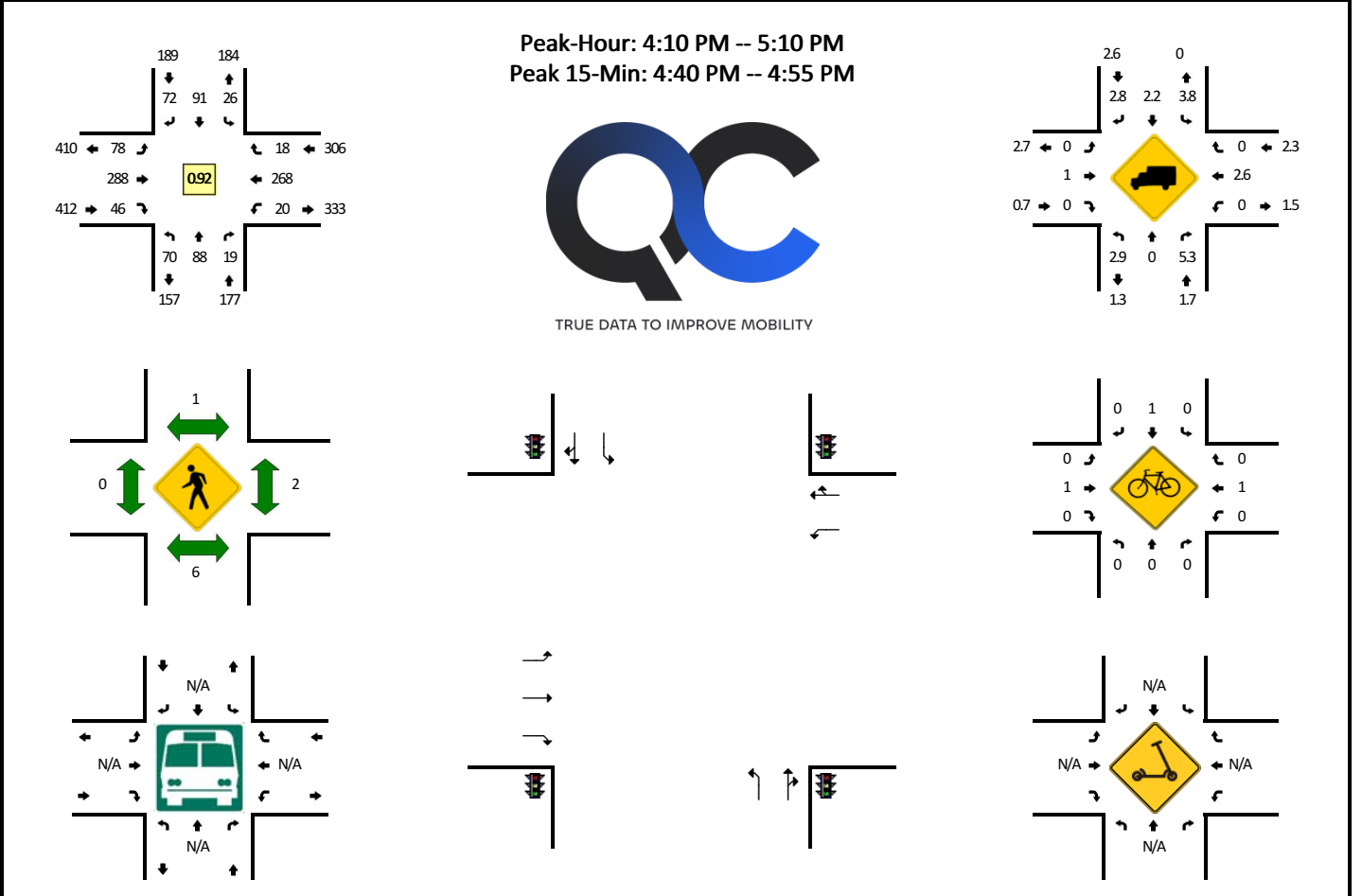


5-Min Count Period Beginning At	NE 72nd Ave (Northbound)				NE 72nd Ave (Southbound)				NE 63rd St (Eastbound)				NE 63rd St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	2	4	0	0	0	2	4	0	3	10	1	0	2	8	0	0	36	
7:05 AM	1	1	1	0	0	3	8	0	1	4	4	0	0	16	0	0	39	
7:10 AM	3	6	0	0	1	4	4	0	1	10	4	0	1	15	0	0	49	
7:15 AM	2	2	1	0	0	3	5	0	0	5	5	0	0	18	3	0	44	
7:20 AM	2	2	0	0	0	8	9	0	3	9	5	0	1	11	1	0	51	
7:25 AM	3	1	4	0	2	6	9	0	2	8	3	0	1	20	2	0	61	
7:30 AM	3	3	0	0	1	4	4	0	1	7	2	0	6	17	3	0	51	
7:35 AM	5	3	0	0	1	8	7	0	0	5	7	0	3	16	0	0	55	
7:40 AM	8	4	2	0	1	5	6	0	3	10	5	0	3	16	2	0	65	
7:45 AM	10	7	7	0	1	8	7	0	1	6	5	0	4	21	0	0	77	
7:50 AM	14	7	12	0	2	5	6	0	3	11	7	0	8	27	2	0	104	
7:55 AM	16	6	8	0	2	13	3	0	3	12	4	0	8	15	1	0	91	723
8:00 AM	19	9	9	0	0	6	2	0	5	15	5	0	5	18	6	0	99	786
8:05 AM	18	8	13	0	2	4	2	0	3	10	5	0	4	19	1	0	89	836
8:10 AM	7	3	3	0	2	9	4	0	3	16	3	0	2	19	1	0	72	859
8:15 AM	6	2	2	0	1	5	8	0	4	13	1	0	1	12	1	0	56	871
8:20 AM	4	3	2	0	1	3	3	0	7	9	2	0	3	20	0	0	57	877
8:25 AM	1	6	0	0	1	1	7	0	3	13	3	0	1	11	0	0	47	863
8:30 AM	2	2	2	0	3	5	5	0	1	17	2	0	2	11	2	0	54	866
8:35 AM	2	3	0	0	0	1	6	0	3	9	1	0	1	20	0	0	46	857
8:40 AM	1	2	1	0	1	4	6	0	3	17	2	0	2	21	0	0	60	852
8:45 AM	5	3	1	0	5	7	6	0	3	14	2	0	1	14	2	0	63	838
8:50 AM	2	6	3	0	0	4	2	0	2	10	1	0	1	14	1	0	46	780
8:55 AM	7	3	1	0	1	3	3	0	5	10	2	0	2	19	2	0	58	747
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	196	88	116	0	16	96	44	0	44	152	64	0	84	240	36	0	1176	
Heavy Trucks	28	4	4		4	8	4		4	8	0		0	12	8		84	
Buses																		
Pedestrians	4	0				0				0				0			0	
Bicycles						0				0				0			0	
Scooters						0				0				0			4	

Comments:

**LOCATION:** NE 72nd Ave -- NE 63rd St  
**CITY/STATE:** Vancouver, WA

**QC JOB #:** 16335704  
**DATE:** Thu, Sep 21 2023



5-Min Count Period Beginning At	NE 72nd Ave (Northbound)				NE 72nd Ave (Southbound)				NE 63rd St (Eastbound)				NE 63rd St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	5	8	3	0	3	6	2	0	8	18	1	0	3	15	4	0	76	
4:05 PM	3	6	2	0	1	12	1	0	8	30	2	0	0	20	4	0	89	
4:10 PM	5	7	1	0	4	7	6	0	4	29	2	0	2	26	0	0	93	
4:15 PM	5	9	2	0	3	5	4	0	3	22	1	0	0	21	1	0	76	
4:20 PM	3	6	3	0	2	9	11	0	5	21	5	0	2	20	2	0	89	
4:25 PM	5	6	1	0	2	6	6	0	13	25	3	0	2	20	1	0	90	
4:30 PM	4	4	3	0	1	12	8	0	6	25	6	0	1	23	1	0	94	
4:35 PM	7	7	1	0	2	2	8	0	5	19	2	0	4	28	3	0	88	
4:40 PM	7	8	3	0	4	3	6	0	8	21	5	0	1	22	4	0	92	
4:45 PM	9	7	0	0	2	12	2	0	8	25	5	0	2	28	3	0	103	
4:50 PM	6	11	2	0	0	10	8	0	8	25	2	0	2	26	0	0	100	
4:55 PM	6	4	1	0	1	8	3	0	4	24	6	0	1	15	0	0	73	1063
5:00 PM	6	8	2	0	4	8	4	0	7	26	5	0	2	21	1	0	94	1081
5:05 PM	7	11	0	0	1	9	6	0	7	26	4	0	1	18	2	0	92	1084
5:10 PM	4	7	2	0	4	5	6	0	4	21	5	0	2	23	0	0	83	1074
5:15 PM	6	7	3	0	2	3	3	0	5	30	7	0	0	19	1	0	86	1084
5:20 PM	3	3	2	0	2	11	4	0	8	17	4	0	5	20	1	0	80	1075
5:25 PM	4	6	4	0	2	6	5	0	5	14	2	0	3	24	0	0	75	1060
5:30 PM	2	7	1	0	1	6	6	0	4	21	6	0	0	20	3	0	77	1043
5:35 PM	3	6	1	0	3	8	6	0	6	16	7	0	1	26	5	0	88	1043
5:40 PM	5	5	1	0	1	5	5	0	6	20	3	0	2	25	0	0	78	1029
5:45 PM	7	7	4	0	1	3	8	0	5	34	12	0	2	25	1	0	109	1035
5:50 PM	5	4	2	0	6	4	4	0	9	22	4	0	6	9	3	0	78	1013
5:55 PM	2	8	3	0	0	7	1	0	6	19	1	0	3	20	0	0	70	1010
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	88	104	20	0	24	100	64	0	96	284	48	0	20	304	28	0	1180	
Heavy Trucks	0	0	0		0	4	4		0	0	0		0	12	0		20	
Buses																		
Pedestrians		16				0				0				4			20	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scooters																		

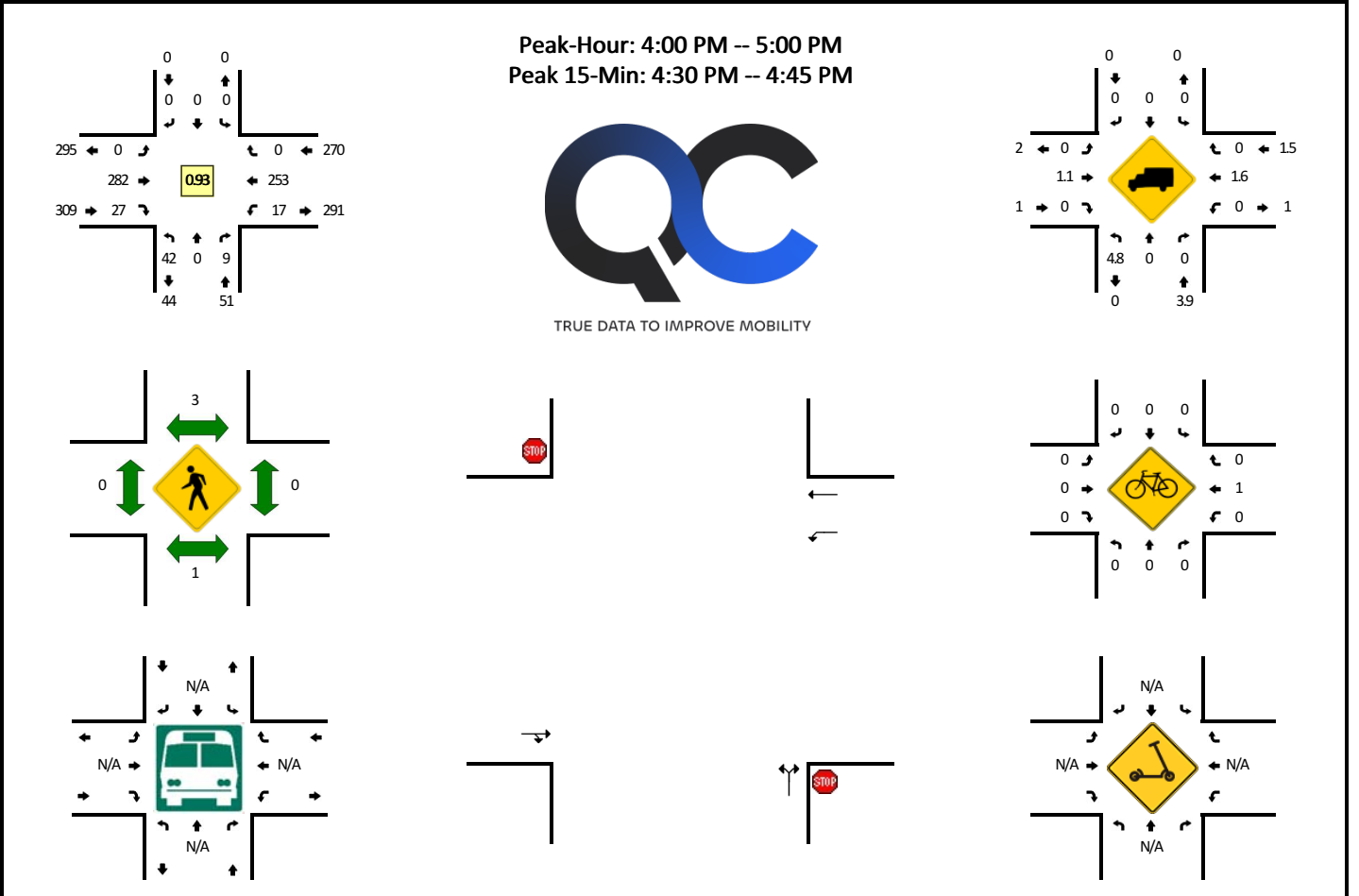
Comments:





**LOCATION:** NE 81st Ave -- NE 63rd St  
**CITY/STATE:** Vancouver, WA

**QC JOB #:** 16335706  
**DATE:** Thu, Sep 21 2023

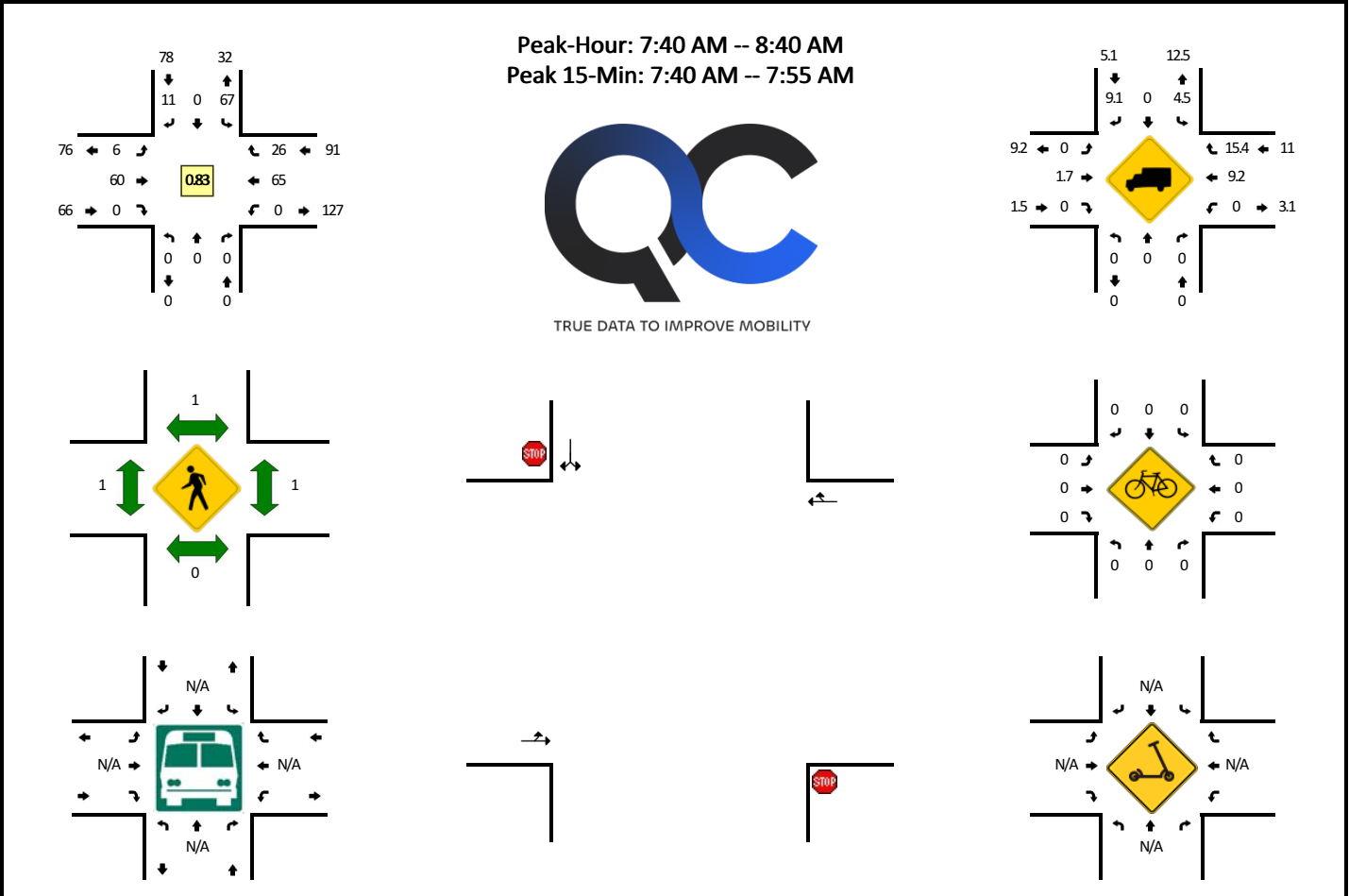


5-Min Count Period Beginning At	NE 81st Ave (Northbound)				NE 81st Ave (Southbound)				NE 63rd St (Eastbound)				NE 63rd St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	4	0	0	0	0	0	0	0	0	33	1	0	1	21	0	0	60	
4:05 PM	4	0	1	0	0	0	0	0	0	31	2	0	2	17	0	0	57	
4:10 PM	3	0	0	0	0	0	0	0	0	22	3	0	2	21	0	0	51	
4:15 PM	0	0	1	0	0	0	0	0	0	26	4	0	1	24	0	0	56	
4:20 PM	3	0	1	0	0	0	0	0	0	19	1	0	2	21	0	0	47	
4:25 PM	4	0	1	0	0	0	0	0	0	18	3	0	2	18	0	0	46	
4:30 PM	3	0	0	0	0	0	0	0	0	26	4	0	1	22	0	0	56	
4:35 PM	5	0	0	0	0	0	0	0	0	19	1	0	2	30	0	0	57	
4:40 PM	5	0	4	0	0	0	0	0	0	22	3	0	1	21	0	0	56	
4:45 PM	5	0	0	0	0	0	0	0	0	20	1	0	1	25	0	0	52	
4:50 PM	3	0	1	0	0	0	0	0	0	25	3	0	0	20	0	0	52	
4:55 PM	3	0	0	0	0	0	0	0	0	21	1	0	2	13	0	0	40	630
5:00 PM	3	0	1	0	0	0	0	0	0	22	5	0	3	17	0	0	51	621
5:05 PM	5	0	0	0	0	0	0	0	0	23	6	0	1	14	0	0	49	613
5:10 PM	3	0	1	0	0	0	0	0	0	19	6	0	1	26	0	0	56	618
5:15 PM	2	0	2	0	0	0	0	0	0	24	3	0	0	19	0	0	50	612
5:20 PM	1	0	0	0	0	0	0	0	0	20	1	0	2	25	0	0	49	614
5:25 PM	2	0	0	0	0	0	0	0	0	17	2	0	0	22	0	0	43	611
5:30 PM	4	0	0	0	0	0	0	0	0	17	3	0	2	20	0	0	46	601
5:35 PM	3	0	0	0	0	0	0	0	0	18	4	0	3	25	0	0	53	597
5:40 PM	0	0	1	0	0	0	0	0	0	18	2	0	4	22	0	0	47	588
5:45 PM	2	0	1	0	0	0	0	0	0	27	4	0	1	22	0	0	57	593
5:50 PM	2	0	2	0	0	0	0	0	0	22	2	0	0	14	0	0	42	583
5:55 PM	0	0	0	0	0	0	0	0	0	27	1	0	2	19	0	0	49	592
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	52	0	16	0	0	0	0	0	0	268	32	0	16	292	0	0	676	
Heavy Trucks	0	0	0		0	0	0		0	8	0		0	12	0		20	
Buses																		
Pedestrians		0				0				0				0			0	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scooters																	0	

Comments:

**LOCATION:** NE 81st Ave -- NE 58th St  
**CITY/STATE:** Vancouver, WA

**QC JOB #:** 16335709  
**DATE:** Thu, Sep 21 2023

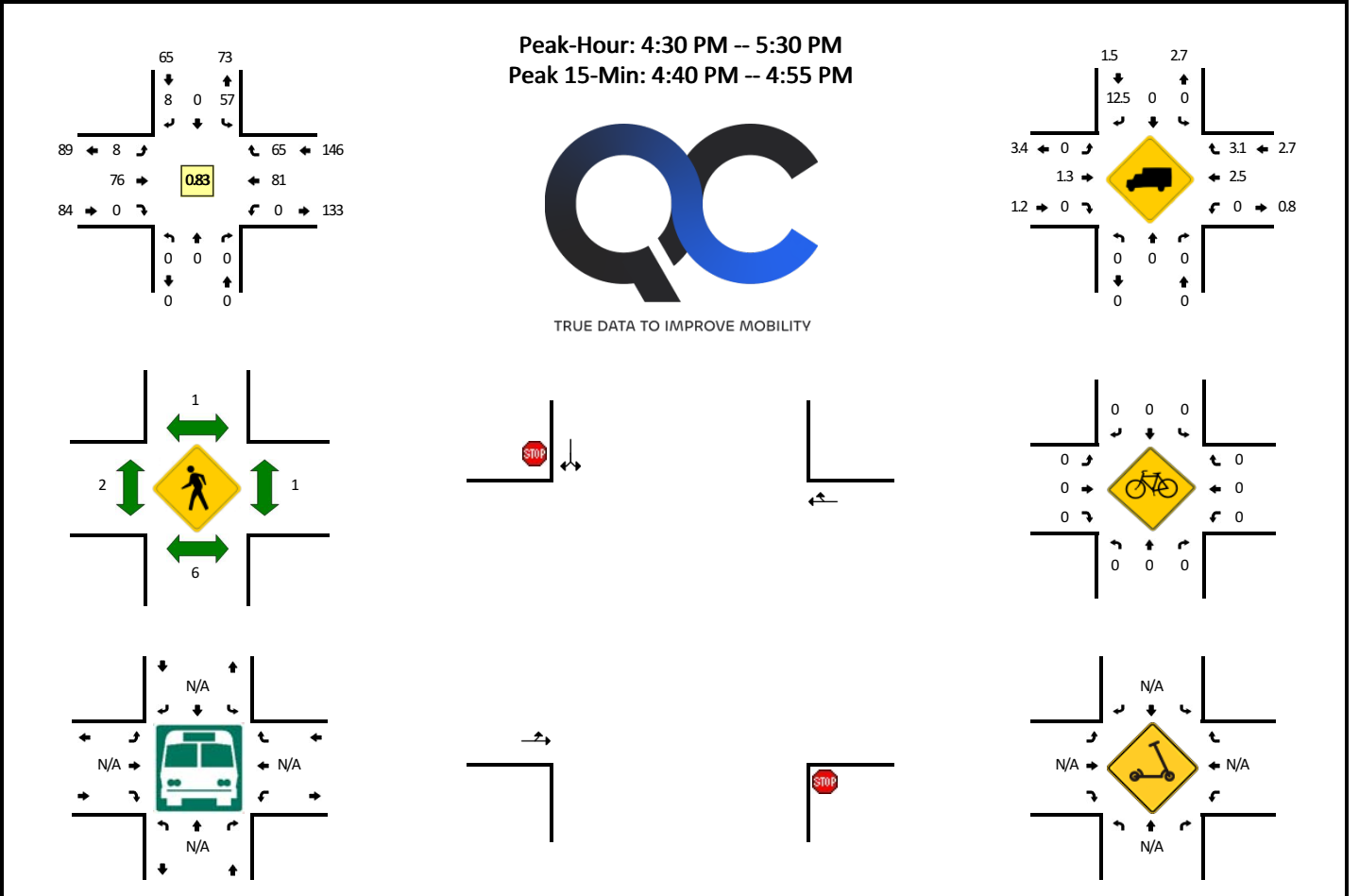


5-Min Count Period Beginning At	NE 81st Ave (Northbound)				NE 81st Ave (Southbound)				NE 58th St (Eastbound)				NE 58th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	1	0	0	0	0	3	0	0	0	3	1	0	8	
7:05 AM	0	0	0	0	7	0	0	0	0	4	0	0	0	1	2	0	14	
7:10 AM	0	0	0	0	7	0	0	0	0	2	0	0	0	3	2	0	14	
7:15 AM	0	0	0	0	1	0	0	0	0	5	0	0	0	2	2	0	10	
7:20 AM	0	0	0	0	3	0	1	0	0	2	0	0	0	6	3	0	15	
7:25 AM	0	0	0	0	1	0	0	0	0	2	0	0	0	4	1	0	8	
7:30 AM	0	0	0	0	2	0	0	0	0	4	0	0	0	5	3	0	14	
7:35 AM	0	0	0	0	4	0	1	0	0	2	0	0	0	5	3	0	15	
7:40 AM	0	0	0	0	4	0	2	0	2	7	0	0	0	11	2	0	28	
7:45 AM	0	0	0	0	6	0	2	0	0	5	0	0	0	5	1	0	19	
7:50 AM	0	0	0	0	5	0	2	0	2	6	0	0	0	7	2	0	24	
7:55 AM	0	0	0	0	10	0	1	0	1	5	0	0	0	8	1	0	26	195
8:00 AM	0	0	0	0	6	0	1	0	0	4	0	0	0	5	2	0	18	205
8:05 AM	0	0	0	0	5	0	0	0	0	0	0	0	0	6	2	0	13	204
8:10 AM	0	0	0	0	5	0	0	0	0	4	0	0	0	4	4	0	17	207
8:15 AM	0	0	0	0	1	0	0	0	0	3	0	0	0	2	1	0	7	204
8:20 AM	0	0	0	0	5	0	0	0	0	14	0	0	0	3	5	0	27	216
8:25 AM	0	0	0	0	4	0	3	0	1	1	0	0	0	5	3	0	17	225
8:30 AM	0	0	0	0	7	0	0	0	0	6	0	0	0	7	2	0	22	233
8:35 AM	0	0	0	0	9	0	0	0	0	5	0	0	0	2	1	0	17	235
8:40 AM	0	0	0	0	5	0	0	0	0	4	0	0	0	7	4	0	20	227
8:45 AM	0	0	0	0	4	0	1	0	2	1	0	0	0	4	2	0	14	222
8:50 AM	0	0	0	0	1	0	0	0	1	7	0	0	0	4	3	0	16	214
8:55 AM	0	0	0	0	2	0	2	0	0	3	0	0	0	3	1	0	11	199
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	60	0	24	0	16	72	0	0	0	92	20	0	284	
Heavy Trucks	0	0	0	0	4	0	0	0	0	0	0	0	0	0	4	0	8	
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Scoters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

**LOCATION:** NE 81st Ave -- NE 58th St  
**CITY/STATE:** Vancouver, WA

**QC JOB #:** 16335710  
**DATE:** Thu, Sep 21 2023

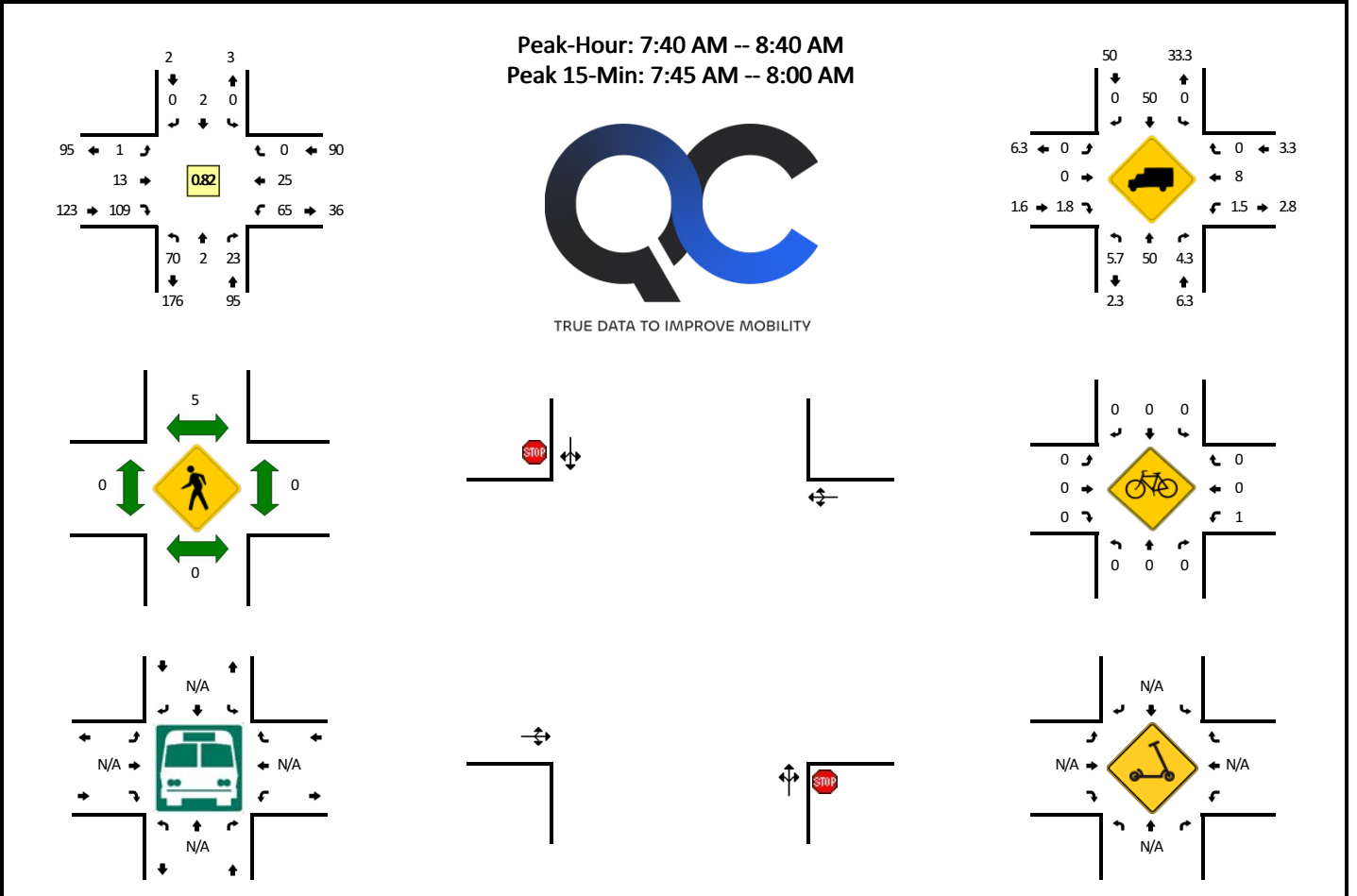


5-Min Count Period Beginning At	NE 81st Ave (Northbound)				NE 81st Ave (Southbound)				NE 58th St (Eastbound)				NE 58th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	1	0	1	0	0	1	0	0	0	7	4	0	14	
4:05 PM	0	0	0	0	6	0	0	0	1	3	0	0	0	8	3	0	21	
4:10 PM	0	0	0	0	6	0	0	0	0	12	0	0	0	8	2	0	28	
4:15 PM	0	0	0	0	4	0	0	0	0	4	0	0	0	5	3	0	16	
4:20 PM	0	0	0	0	1	0	1	0	0	8	0	0	0	7	4	0	21	
4:25 PM	0	0	0	0	3	0	1	0	0	1	0	0	0	6	3	0	14	
4:30 PM	0	0	0	0	5	0	0	0	0	8	0	0	0	7	7	0	27	
4:35 PM	0	0	0	0	2	0	0	0	1	7	0	0	0	5	5	0	20	
4:40 PM	0	0	0	0	4	0	1	0	0	14	0	0	0	9	8	0	36	
4:45 PM	0	0	0	0	5	0	1	0	2	10	0	0	0	5	4	0	27	
4:50 PM	0	0	0	0	5	0	2	0	0	2	0	0	0	12	5	0	26	
4:55 PM	0	0	0	0	3	0	1	0	0	1	0	0	0	13	5	0	23	273
5:00 PM	0	0	0	0	5	0	1	0	0	5	0	0	0	3	5	0	19	278
5:05 PM	0	0	0	0	6	0	1	0	0	1	0	0	0	9	7	0	24	281
5:10 PM	0	0	0	0	7	0	1	0	2	5	0	0	0	9	3	0	27	280
5:15 PM	0	0	0	0	7	0	0	0	3	6	0	0	0	2	3	0	21	285
5:20 PM	0	0	0	0	5	0	0	0	0	8	0	0	0	2	5	0	20	284
5:25 PM	0	0	0	0	3	0	0	0	0	9	0	0	0	5	8	0	25	295
5:30 PM	0	0	0	0	3	0	0	0	0	5	0	0	0	7	5	0	20	288
5:35 PM	0	0	0	0	5	0	1	0	0	2	0	0	0	9	5	0	22	290
5:40 PM	0	0	0	0	8	0	1	0	2	12	0	0	0	8	1	0	32	286
5:45 PM	0	0	0	0	5	0	1	0	2	8	0	0	0	13	5	0	34	293
5:50 PM	0	0	0	0	4	0	0	0	1	4	0	0	0	2	5	0	16	283
5:55 PM	0	0	0	0	1	0	0	0	1	6	0	0	0	9	1	0	18	278
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	0	0	0	0	56	0	16	0	8	104	0	0	0	104	68	0	356	
Heavy Trucks	0	0	0	0	0	0	4	0	0	0	0	0	0	4	4	0	12	
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pedestrians	0	4	0	0	0	0	0	0	0	4	0	0	0	4	0	0	12	
Bicycles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Scoters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Comments:

**LOCATION:** NE 82nd Ct/NE 82nd Ave -- NE 58th St  
**CITY/STATE:** Vancouver, WA

**QC JOB #:** 16335707  
**DATE:** Thu, Sep 21 2023

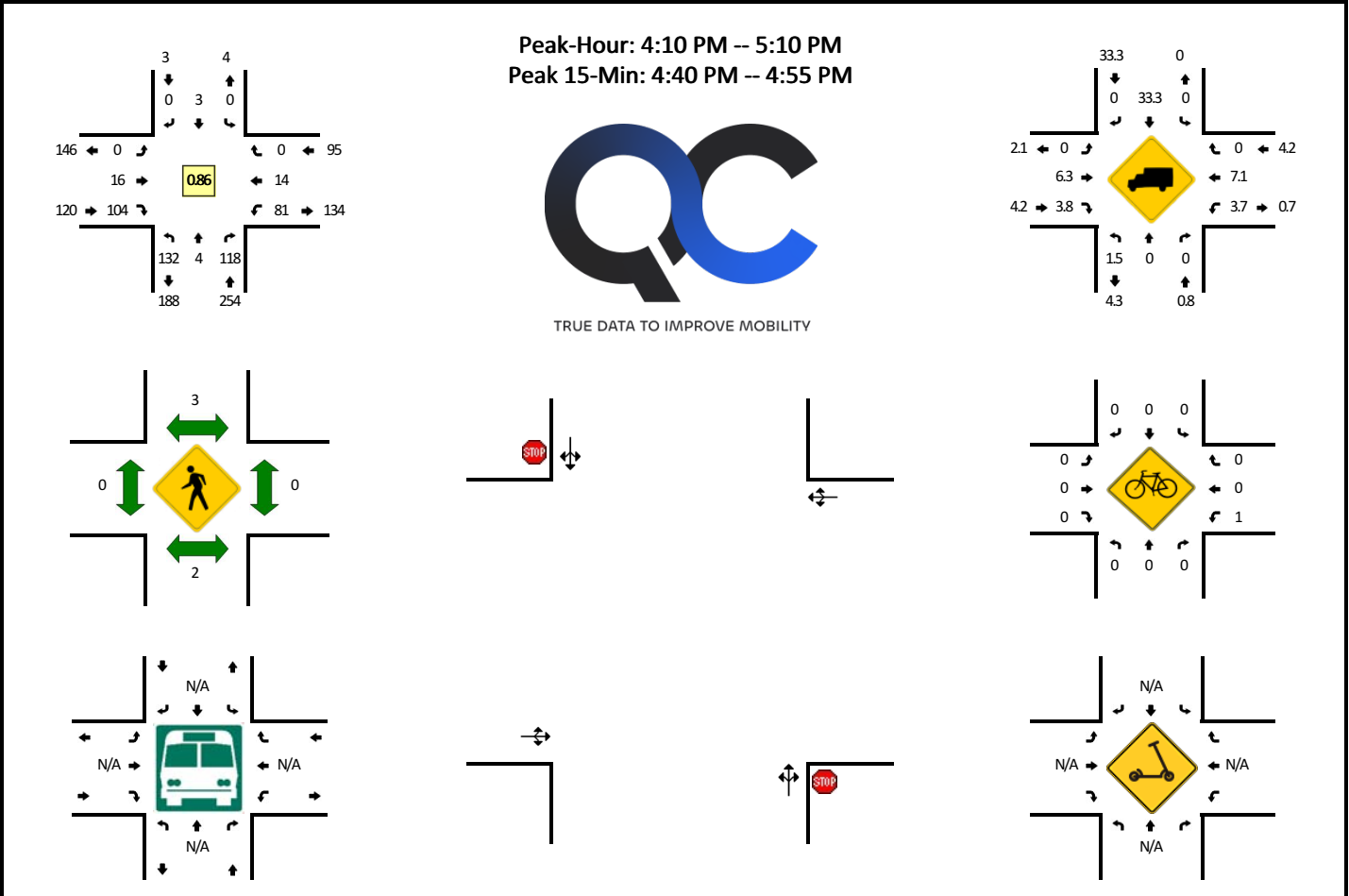


5-Min Count Period Beginning At	NE 82nd Ct/NE 82nd Ave (Northbound)				NE 82nd Ct/NE 82nd Ave (Southbound)				NE 58th St (Eastbound)				NE 58th St (Westbound)				Total	Hourly Totals	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
7:00 AM	3	0	2	0	0	0	0	0	0	0	0	4	0	4	1	0	0	14	
7:05 AM	2	0	2	0	0	0	0	0	0	0	0	11	0	3	1	0	0	19	
7:10 AM	2	1	1	0	0	0	0	0	0	0	1	8	0	4	1	0	0	18	
7:15 AM	3	0	3	0	0	0	0	0	0	0	0	5	0	7	1	0	0	19	
7:20 AM	8	0	1	0	0	0	0	0	0	0	1	5	0	7	1	0	0	23	
7:25 AM	2	0	1	0	0	0	0	0	0	0	0	3	0	7	3	0	0	16	
7:30 AM	7	0	0	0	0	0	0	0	0	0	0	6	0	7	1	0	0	21	
7:35 AM	6	0	1	0	0	0	1	0	0	0	0	6	0	9	1	0	0	24	
7:40 AM	10	0	2	0	0	1	0	0	0	0	0	11	0	9	3	0	0	36	
7:45 AM	2	0	1	0	0	0	0	0	0	0	0	11	0	10	4	0	0	28	
7:50 AM	6	0	3	0	0	0	0	0	0	0	3	6	0	8	3	0	0	29	
7:55 AM	8	0	7	0	0	0	0	0	0	0	3	14	0	5	1	0	0	38	285
8:00 AM	5	0	0	0	0	0	0	0	0	0	0	9	0	2	3	0	0	19	290
8:05 AM	7	0	1	0	0	0	0	0	0	0	0	2	0	4	3	0	0	17	288
8:10 AM	7	0	2	0	0	0	0	0	0	0	1	9	0	3	0	0	0	22	292
8:15 AM	3	0	1	0	0	0	0	0	0	0	0	4	0	8	1	0	0	17	290
8:20 AM	7	1	1	0	0	0	0	0	0	0	3	16	0	5	2	0	0	35	302
8:25 AM	4	0	1	0	0	0	0	0	0	0	0	4	0	4	2	0	0	15	301
8:30 AM	9	1	1	0	0	0	0	0	0	1	1	11	0	1	2	0	0	27	307
8:35 AM	2	0	3	0	0	1	0	0	0	0	2	12	0	6	1	0	0	27	310
8:40 AM	8	1	2	0	0	1	0	0	0	0	2	5	0	5	2	0	0	26	300
8:45 AM	4	0	3	0	0	0	0	0	0	0	2	6	0	6	0	0	0	21	293
8:50 AM	6	0	2	0	0	0	0	0	0	0	1	5	0	6	1	0	0	21	285
8:55 AM	5	0	1	0	0	0	0	0	0	0	0	6	0	5	0	0	0	17	264
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total		
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U			
All Vehicles	64	0	44	0	0	0	0	0	0	24	124	0	92	32	0	0	380		
Heavy Trucks	0	0	4		0	0	0		0	0	0		0	0	0		4		
Buses																			
Pedestrians	0	0			0				0				0				0		
Bicycles	0	0			0	0			0	0			4	0			4		
Scoters																			

Comments:

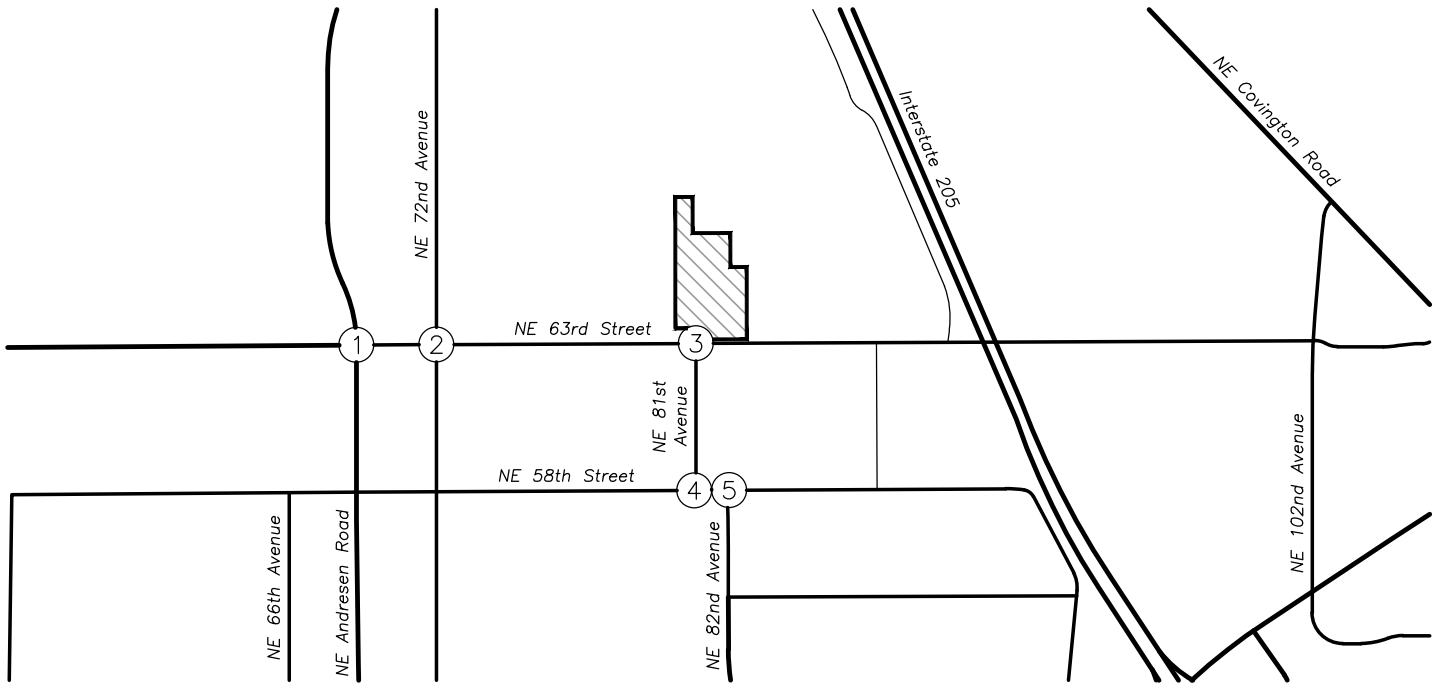
**LOCATION:** NE 82nd Ct/NE 82nd Ave -- NE 58th St  
**CITY/STATE:** Vancouver, WA

**QC JOB #:** 16335708  
**DATE:** Thu, Sep 21 2023

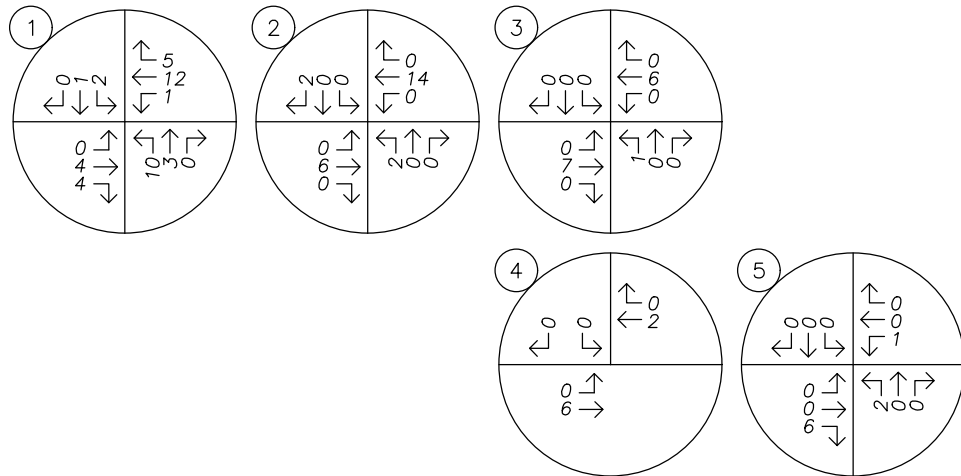


5-Min Count Period Beginning At	NE 82nd Ct/NE 82nd Ave (Northbound)				NE 82nd Ct/NE 82nd Ave (Southbound)				NE 58th St (Eastbound)				NE 58th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	10	1	5	0	0	0	0	0	0	2	0	0	5	1	0	0	24	
4:05 PM	11	0	9	0	0	0	0	0	0	2	6	0	6	1	1	0	36	
4:10 PM	10	0	10	0	0	0	0	0	0	2	15	0	6	1	0	0	44	
4:15 PM	7	1	12	0	0	1	0	0	0	0	8	0	5	0	0	0	34	
4:20 PM	10	0	10	0	0	0	0	0	0	1	6	0	8	0	0	0	35	
4:25 PM	8	2	4	0	0	0	0	0	0	1	5	0	6	2	0	0	28	
4:30 PM	11	0	14	0	0	1	0	0	0	2	10	0	9	2	0	0	49	
4:35 PM	11	0	11	0	0	0	0	0	0	1	8	0	5	0	0	0	36	
4:40 PM	15	0	11	0	0	0	0	0	0	2	16	0	4	1	0	0	49	
4:45 PM	8	0	8	0	0	1	0	0	0	4	11	0	9	3	0	0	44	
4:50 PM	15	1	10	0	0	0	0	0	0	1	6	0	10	1	0	0	44	
4:55 PM	16	0	11	0	0	0	0	0	0	1	3	0	5	0	0	0	36	459
5:00 PM	9	0	9	0	0	0	0	0	0	1	9	0	2	1	0	0	31	466
5:05 PM	12	0	8	0	0	0	0	0	0	0	7	0	12	3	0	0	42	472
5:10 PM	10	0	12	0	0	0	0	0	0	2	9	0	4	2	0	0	39	467
5:15 PM	5	0	5	0	0	0	0	0	0	0	13	0	7	0	0	0	30	463
5:20 PM	9	0	7	0	0	1	0	0	0	5	9	0	2	0	0	0	33	461
5:25 PM	11	0	12	0	0	0	0	0	0	2	9	0	1	0	0	0	35	468
5:30 PM	9	2	7	0	0	0	1	0	1	2	6	0	4	2	0	0	34	453
5:35 PM	10	0	6	0	0	0	0	0	0	0	7	0	5	4	0	0	32	449
5:40 PM	9	1	9	0	1	0	0	0	0	4	12	0	3	0	0	0	39	439
5:45 PM	15	1	10	0	0	0	0	0	0	1	14	0	5	2	0	0	48	443
5:50 PM	7	0	10	0	0	0	0	0	0	2	7	0	8	0	0	0	34	433
5:55 PM	8	0	6	0	0	0	0	0	0	3	4	0	9	2	0	0	32	429
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total	
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
All Vehicles	152	4	116	0	0	4	0	0	0	28	132	0	92	20	0	0	548	
Heavy Trucks	4	0	0		0	0	0		0	0	0		0	4	0		8	
Buses																		
Pedestrians		4				0				0				0			4	
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0	
Scoters																		

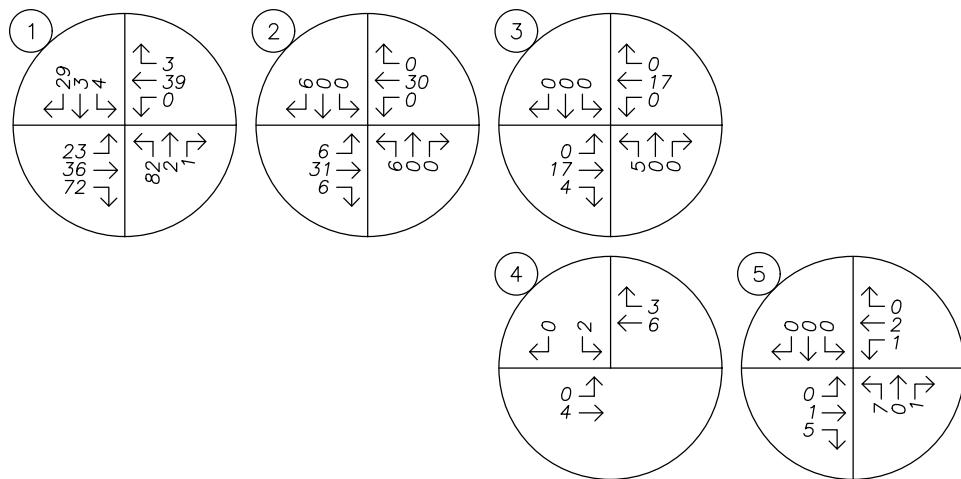
*Comments:*



AM PEAK HOUR



PM PEAK HOUR



no scale

## Appendix C – Safety Analysis

Crash History Data

Left-Turn Lane Warrants

Traffic Signal Warrant Analysis





OFFICER REPORTED CRASHES THAT OCCURRED at OR in the vicinity of MULTIPLE INTERSECTIONS IN THE CITY OF VANCOUVER

01/01/2018 - 12/31/2022 See 2nd tab below for road info

**INTERSECTIONS**

63rd St @ Andresen Rd

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, 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	A / B	SR ONLY HISTORY/SUSPENSE	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FATH	# P E D S	# B I K E S	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION	VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	
City Street	Clark	Vancouver	NE 63RD ST	6800	NE ANDRESEN RD							No	EB25848	04/11/2021	07:29	No Apparent Injury	0	0	2	0	0	Passenger Car	Passenger Car	At Intersection and Related	Clear	Dry	Daylight	Entering at angle	Going Straight Ahead	Going Straight Ahead	East
City Street	Clark	Vancouver	NE 63RD ST	6800	NE ANDRESEN RD							No	ED00165	11/03/2022	10:04	No Apparent Injury	0	0	3	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Overcast	Dry	Daylight	Entering at angle	Going Straight Ahead	Going Straight Ahead	West
City Street	Clark	Vancouver	NE 63RD ST	6300	NE ANDRESEN RD							No	EA10409	01/13/2020	08:55	Possible Injury	1	0	2	0	0	Passenger Car	Passenger Car	At Intersection and Related	Raining	Wet	Daylight	Entering at angle	Making Right Turn	Going Straight Ahead	West
City Street	Clark	Vancouver	NE 63RD ST	6800	NE ANDRESEN RD							No	EB39975	06/16/2021	14:06	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Slowing	Stopped at Signal or Stop Sign	East
City Street	Clark	Vancouver	NE 63RD ST	0	NE ANDRESEN RD							No	E831660	08/25/2018	07:18	Possible Injury	3	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	Entering at angle	Going Straight Ahead	Going Straight Ahead	East
City Street	Clark	Vancouver	NE 63RD ST	3800		76	F	E	NE ANDRESEN RD			No	EA00852	01/05/2020	17:38	No Apparent Injury	0	0	3	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	Intersection Related but Not at Intersection	Raining	Wet	Dark-Street Lights On	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	East
City Street	Clark	Vancouver	NE ANDRESEN RD	0	NE 63RD ST							No	E899470	03/05/2019	07:21	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	South
City Street	Clark	Vancouver	NE ANDRESEN RD	9900	NE 63RD ST							No	EB06270	02/13/2021	19:11	Suspected Serious Injury	2	0	2	0	0	Passenger Car	Passenger Car	At Intersection and Related	Snowing	Snow/Slush	Dark-Street Lights On	From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Going Straight Ahead	South
City Street	Clark	Vancouver	NE ANDRESEN RD	6322	NE 63RD ST							No	EB81038	10/23/2021	16:59	No Apparent Injury	0	0	2	0	0	Passenger Car	Passenger Car	At Intersection and Related	Raining	Wet	Daylight	From same direction - both going straight - both moving - rear-end	Slowing	Slowing	North
City Street	Clark	Vancouver	NE ANDRESEN RD	0	NE 63RD ST							No	E988842	12/02/2019	10:52	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	North
City Street	Clark	Vancouver	NE ANDRESEN RD	6322	NE 63RD ST							No	EC60533	06/29/2022	17:36	Suspected Minor Injury	1	0	2	0	0	Motorcycle	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear	Dry	Daylight	From same direction - both going straight - both moving - rear-end	Changing Lanes	Going Straight Ahead	North
City Street	Clark	Vancouver	NE ANDRESEN RD	6322	NE 63RD ST							No	EA81038	11/12/2020	21:17	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Raining	Wet	Dark-Street Lights On	Entering at angle	Slowing	Going Straight Ahead	South

OFFICER REPORTED CRASHES THAT OCCURRED at OR in the vicinity of MULTIPLE INTERSECTIONS IN THE CITY OF VANCOUVER

01/01/2018 - 12/31/2022 See 2nd tab below for road info

**INTERSECTIONS**

63rd St @ Andresen Rd

*Under 23 U.S. Code § 148 and 23 U.S. Code § 407, 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.*

VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD	
West	North	South	Disregard Traffic Sign and Signals			None													Lane of Primary Trafficway	1102993.39	129181.77
East	North	South	Disregard Traffic Sign and Signals			None													Lane of Primary Trafficway	1102993.39	129181.77
South	North	South	Did Not Grant RW to Vehicle	Overcorrecting / Oversteering		None													Intersecting Trafficway	1102991.02	129114.59
West	Vehicle Stopped	Vehicle Stopped	Other Distractions			None													Lane of Primary Trafficway	1102993.39	129181.77
West	South	North	Did Not Grant RW to Vehicle			Driver Not Distracted													Lane of Primary Trafficway	1102993.55	129182.15
West	Vehicle Stopped	Vehicle Stopped	Unknown Distraction			None													Lane of Primary Trafficway	1103069.46	129183.29
North	Vehicle Stopped	Vehicle Stopped	Inattention			None													Lane of Primary Trafficway	1102993.55	129182.15
North	South	North	Exceeding Reas. Safe Speed			None													Lane of Primary Trafficway	1103028.08	129183.02
South	North	South	Eating or Drinking			None													Lane of Primary Trafficway	1102993.39	129181.77
South	North	South	Apparently Fatigued			None													Lane of Primary Trafficway	1102993.55	129182.14
South	North	South	Improper Turn/Merge			None													Lane of Primary Trafficway	1102993.39	129181.77
North	East	West	Other Contributing Circ Not Listed			None													Lane of Primary Trafficway	1102993.39	129181.77

OFFICER REPORTED CRASHES THAT OCCURRED at OR in the vicinity of MULTIPLE INTERSECTIONS IN THE CITY OF VANCOUVER

01/01/2018 - 12/31/2022 See 2nd tab below for road info

**INTERSECTIONS**

63rd St @ Andresen Rd

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, 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	A / B	SR ONLY HISTORY/SUSPENSE	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FATAL	# VEH	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION	VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM	
City Street	Clark	Vancouver	NE ANDRESEN RD	6322	NE 63RD ST							No	EB96039	11/19/2021	19:17	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Dusk	From same direction - both going straight - one stopped - rear-end	Slowing	Stopped at Signal or Stop Sign	South
City Street	Clark	Vancouver	NE ANDRESEN RD	0	NE 63RD ST							No	E966580	09/05/2019	05:16	Suspected Minor Injury	1	0	1	1	0	Pickup,Panel Truck or Vanette under 10,000 lb		At Intersection and Related	Clear or Partly Cloudy	Dry	Dark-Street Lights On	Vehicle going straight hits pedestrian	Going Straight Ahead		North
City Street	Clark	Vancouver	NE ANDRESEN RD	9900	NE 63RD ST							No	EA40938	06/17/2020	08:01	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	South
City Street	Clark	Vancouver	NE ANDRESEN RD	6322	NE 63RD ST							No	EC77399	08/19/2022	16:13	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	Entering at angle	Going Straight Ahead	Going Straight Ahead	East
City Street	Clark	Vancouver	NE ANDRESEN RD	6300		77	F	N	NE 63RD ST			No	E966942	10/02/2019	11:27	No Apparent Injury	0	0	3	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	Intersection Related but Not at Intersection	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - both moving - rear-end	Going Straight Ahead	Going Straight Ahead	North
City Street	Clark	Vancouver	NE ANDRESEN RD	6300		178	F	N	NE 63RD ST			No	E862950	11/20/2018	16:50	No Apparent Injury	0	0	3	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Passenger Car	Intersection Related but Not at Intersection	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped for Traffic	North

OFFICER REPORTED CRASHES THAT OCCURRED at OR in the vicinity of MULTIPLE INTERSECTIONS IN THE CITY OF VANCOUVER

01/01/2018 - 12/31/2022 See 2nd tab below for road info

**INTERSECTIONS**

63rd St @ Andresen Rd

*Under 23 U.S. Code § 148 and 23 U.S. Code § 407, 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.*

VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
North	Vehicle Stopped	Vehicle Stopped	Unknown Distraction			None												Lane of Primary Trafficway	1102993.39	129181.77
South			None												Did Not Grant RW to Vehicle			Lane of Primary Trafficway	1102993.55	129182.15
North	Vehicle Stopped	Vehicle Stopped	Unknown Distraction			None												Lane of Primary Trafficway	1103028.09	129183.41
West	South	North	Disregard Traffic Sign and Signals			None												Lane of Primary Trafficway	1102993.39	129181.77
West	North	West	Inattention			None												Lane of Primary Trafficway	1102994.89	129262.10
South	Vehicle Stopped	Vehicle Stopped	Driver Not Distracted			Driver Not Distracted												Lane of Primary Trafficway	1102991.11	129362.78

OFFICER REPORTED CRASHES THAT OCCURRED at OR in the vicinity of MULTIPLE INTERSECTIONS IN THE CITY OF VANCOUVER

01/01/2018 - 12/31/2022 See 2nd tab below for road info

**INTERSECTIONS**

63rd St @ 72nd Ave

Under 23 U.S. Code § 148 and 23 U.S. Code § 407, 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	A / B	SR ONLY HISTORY/SUSPENSE	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FATAL	# VEH	# PEDES	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION	VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM
City Street	Clark	Vancouver	NE 63RD ST	0	NE 72ND AVE							No	EA42497	06/23/2020	14:13	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Passenger Car	At Intersection and Related	Clear	Dry	Daylight	Entering at angle	Going Straight Ahead	Going Straight Ahead	South
City Street	Clark	Vancouver	NE 63RD ST	6200	NE 72ND AVE							No	EB64534	09/02/2021	13:50	Suspected Minor Injury	1	0	1	1	0	Passenger Car		At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	Vehicle turning left hits pedestrian	Making Left Turn		East
City Street	Clark	Vancouver	NE 63RD ST	7200	NE 72ND AVE							No	EB67848	09/15/2021	10:56	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	West
City Street	Clark	Vancouver	NE 63RD ST	0	NE 72ND AVE							No	E996756	12/22/2019	12:45	Possible Injury	1	0	2	0	0	Passenger Car	Passenger Car	At Intersection and Related	Overcast	Dry	Daylight	Entering at angle	Going Straight Ahead	Going Straight Ahead	East
City Street	Clark	Vancouver	NE 63RD ST	0	NE 72ND AVE							No	EA21785	03/08/2020	13:42	Suspected Minor Injury	1	0	2	0	0	Passenger Car	Passenger Car	At Intersection and Related	Clear	Dry	Daylight	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	West
City Street	Clark	Vancouver	NE 63RD ST	0	NE 72ND AVE							No	E767024	02/01/2018	14:13	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Raining	Wet	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Going Straight Ahead	East
City Street	Clark	Vancouver	NE 63RD ST	7200	NE 72ND AVE							No	EC13145	01/16/2022	18:14	Possible Injury	1	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Overcast	Dry	Dark-Street Lights On	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	East
City Street	Clark	Vancouver	NE 63RD ST	0	NE 72ND AVE							No	E851908	08/03/2018	18:23	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From same direction - both going straight - one stopped - rear-end	Going Straight Ahead	Stopped at Signal or Stop Sign	East
City Street	Clark	Vancouver	NE 63RD ST	7100		78	F	W	NE 72ND AVE			No	EA26252	03/24/2020	14:37	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	Intersection Related but Not at Intersection	Overcast	Dry	Daylight	From same direction - both going straight - both moving - sideswipe	Changing Lanes	Going Straight Ahead	West
City Street	Clark	Vancouver	NE 72ND AVE	0	NE 63RD ST							No	E995924	12/20/2019	13:54	No Apparent Injury	0	0	2	0	0	Pickup,Panel Truck or Vanette under 10,000 lb	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Raining	Wet	Daylight	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	South
City Street	Clark	Vancouver	NE 72ND AVE	6300	NE 63RD ST							No	EA72617	10/15/2020	19:15	Suspected Minor Injury	1	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Dark-Street Lights On	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	North
City Street	Clark	Vancouver	NE 72ND AVE	0	NE 63RD ST							No	E808653	06/14/2018	19:43	No Apparent Injury	0	0	2	0	0	Passenger Car	Pickup,Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear or Partly Cloudy	Dry	Daylight	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	South

OFFICER REPORTED CRASHES THAT OCCURRED at OR in the vicinity of MULTIPLE INTERSECTIONS IN THE CITY OF VANCOUVER

01/01/2018 - 12/31/2022 See 2nd tab below for road info

**INTERSECTIONS**

63rd St @ 72nd Ave

*Under 23 U.S. Code § 148 and 23 U.S. Code § 407, 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.*

VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
North	East	West	Under Influence of Alcohol	Exceeding Stated Speed Limit	Disregard Traffic Sign and Signals	None												Lane of Primary Trafficway	1103729.85	129181.69
South			Did Not Grant R/W to Non Motorist	Lost in Thought / Day Dreaming											None			Intersecting Trafficway	1103715.24	129121.16
East	Vehicle Stopped	Vehicle Stopped	Unknown Distraction			None												Lane of Primary Trafficway	1103729.99	129181.85
West	South	North	Disregard Stop and Go Light			None												Lane of Primary Trafficway	1103729.85	129181.69
North	East	West	Disregard Traffic Sign and Signals			None												Lane of Primary Trafficway	1103729.85	129181.69
West	North	South	Inattention			None												Lane of Primary Trafficway	1103729.85	129181.68
South	West	East	Did Not Grant RW to Vehicle			None												Lane of Primary Trafficway	1103729.99	129181.85
West	Vehicle Stopped	Vehicle Stopped	Under Influence of Alcohol			None												Lane of Primary Trafficway	1103729.85	129181.68
East	West	East	Did Not Grant RW to Vehicle			None												Lane of Primary Trafficway	1103651.12	129181.85
West	North	South	Inattention			None												Lane of Primary Trafficway	1103729.85	129181.69
East	South	North	Under Influence of Alcohol			None												Lane of Primary Trafficway	1103729.85	129181.69
West	North	South	Did Not Grant RW to Vehicle			Driver Not Distracted												Lane of Primary Trafficway	1103729.85	129181.68

OFFICER REPORTED CRASHES THAT OCCURRED at OR in the vicinity of MULTIPLE INTERSECTIONS IN THE CITY OF VANCOUVER

01/01/2018 - 12/31/2022 See 2nd tab below for road info

**INTERSECTIONS**

63rd St @ 72nd Ave

*Under 23 U.S. Code § 148 and 23 U.S. Code § 407, 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	A / B	SR ONLY HISTORY/SUSPENSE	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FATAL	# VEH	# PEDES	# BIKES	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION	VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM
City Street	Clark	Vancouver	NE 72ND AVE	6300	NE 63RD ST							No	EC77564	08/24/2022	18:22	No Apparent Injury	0	0	2	0	0	Truck (Flatbad, Van, etc)	Pickup, Panel Truck or Vanette under 10,000 lb	At Intersection and Related	Clear	Dry	Daylight	Entering at angle	Going Straight Ahead	Going Straight Ahead	South
City Street	Clark	Vancouver	NE 72ND AVE	6300	NE 63RD ST							No	EC19782	01/31/2022	11:32	No Apparent Injury	0	0	1	0	0	Pickup, Panel Truck or Vanette under 10,000 lb		At Intersection and Related	Clear	Wet	Daylight	Fence	Making Left Turn		North
City Street	Clark	Vancouver	NE 72ND AVE	6300	NE 63RD ST							No	EB14349	03/14/2021	20:22	No Apparent Injury	0	0	2	0	0	Passenger Car	Passenger Car	At Intersection and Related	Raining	Wet	Dark-Street Lights On	From opposite direction - one left turn - one straight	Making Left Turn	Going Straight Ahead	North

OFFICER REPORTED CRASHES THAT OCCURRED at OR in the vicinity of MULTIPLE INTERSECTIONS IN THE CITY OF VANCOUVER

01/01/2018 - 12/31/2022 See 2nd tab below for road info

**INTERSECTIONS**

63rd St @ 72nd Ave

*Under 23 U.S. Code § 148 and 23 U.S. Code § 407, 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.*

VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD	
North	East	West	Disregard Traffic Sign and Signals			None													Lane of Primary Trafficway	1103729.99	129181.85
East			Improper Turn/Merge																Intersecting Trafficway	1103729.99	129181.85
East	South	North	Distracted by Other Occupant			None													Lane of Primary Trafficway	1103729.99	129181.85



OFFICER REPORTED CRASHES THAT OCCURRED at OR in the vicinity of MULTIPLE INTERSECTIONS IN THE CITY OF VANCOUVER

01/01/2018 - 12/31/2022 See 2nd tab below for road info

**INTERSECTIONS**

58th St @ 81st Ave

*Under 23 U.S. Code § 148 and 23 U.S. Code § 407, 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	A / B	SR ONLY HISTORY/SUSPENSE	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# INJ	# FATAL	# VEH	# P E D S	# B I K E S	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION	VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM
City Street	Clark	Vancouver	NE 58TH ST	8100	NE 81ST AVE							No	EB11988	03/05/2021	03:50	No Apparent Injury	0	0	3	0	0	Passenger Car	Passenger Car	At Intersection and Related	Overcast	Wet	Dark-Street Lights On	One parked--one moving	Other*	Legally Parked, Unoccupied	
City Street	Clark	Vancouver	NE 81ST AVE	0	NE 58TH ST							No	EA27713	04/05/2020	01:27	No Apparent Injury	0	0	1	0	0	Passenger Car		At Intersection and Related	Clear	Wet	Dark-Street Lights On	Tree or Stump (stationary)	Making Left Turn		North

OFFICER REPORTED CRASHES THAT OCCURRED at OR in the vicinity of MULTIPLE INTERSECTIONS IN THE CITY OF VANCOUVER

01/01/2018 - 12/31/2022 See 2nd tab below for road info

**INTERSECTIONS**

58th St @ 81st Ave

*Under 23 U.S. Code § 148 and 23 U.S. Code § 407, 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.*

VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD	
			Other Contributing Circ Not Listed			None													Outside Shoulder of Primary Trafficway	1106028.78	127807.53
East			Other Contributing Circ Not Listed																Past the Outside Shoulder of Primary Trafficway	1106028.28	127807.19

OFFICER REPORTED CRASHES THAT OCCURRED at OR in the vicinity of MULTIPLE INTERSECTIONS IN THE CITY OF VANCOUVER

01/01/2018 - 12/31/2022 See 2nd tab below for road info

**INTERSECTIONS**

58th St @ 82nd Ave / 82nd Ct

63rd St @ 81st Ave - No Reported Crashes

*Under 23 U.S. Code § 148 and 23 U.S. Code § 407, 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	A / B	SR ONLY HISTORY/SUSPENSE	REPORT NUMBER	DATE	TIME	MOST SEVERE INJURY TYPE	# I N J	# F A T	# V E H	# P E D S	# B I K E S	VEHICLE 1 TYPE	VEHICLE 2 TYPE	JUNCTION RELATIONSHIP	WEATHER	ROADWAY SURFACE CONDITION	LIGHTING CONDITION	FIRST COLLISION TYPE / OBJECT STRUCK	VEHICLE 1 ACTION	VEHICLE 2 ACTION	VEHICLE 1 COMPASS DIRECTION FROM
--------------	--------	------	--------------------	--------------	-------------------------	---------------------	----------	-------------------------	----------------------	----------	-------	--------------------------	---------------	------	------	-------------------------	---------	---------	---------	-----------	-------------	----------------	----------------	-----------------------	---------	---------------------------	--------------------	--------------------------------------	------------------	------------------	----------------------------------

OFFICER REPORTED CRASHES THAT OCCURRED at OR in the vicinity of MULTIPLE INTERSECTIONS IN THE CITY OF VANCOUVER

01/01/2018 - 12/31/2022 See 2nd tab below for road info

**INTERSECTIONS**

58th St @ 82nd Ave / 82nd Ct

63rd St @ 81st Ave - No Reported Crashes

*Under 23 U.S. Code § 148 and 23 U.S. Code § 407, 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.*

VEHICLE 1 COMPASS DIRECTION TO	VEHICLE 2 COMPASS DIRECTION FROM	VEHICLE 2 COMPASS DIRECTION TO	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	MV DRIVER CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 1)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	BICYCLIST CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 1 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 2 (UNIT 2)	PEDESTRIAN CONTRIBUTING CIRCUMSTANCE 3 (UNIT 2)	FIRST IMPACT LOCATION (City, County & Misc Trafficways - 2010 forward)	WA STATE PLANE SOUTH - X 2010 - FORWARD	WA STATE PLANE SOUTH - Y 2010 - FORWARD
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	--	--	--	--	---	---

## Left-Turn Lane Warrant Analysis



Project: Wood Duck Springs CP/Zone Map Change  
 Intersection: 3. NE 63rd Street at NE 81st Avenue  
 Date: 11/12/2023  
 Scenario: 2031 Future Conditions with Proposed Zone - AM Peak Hour (EB)

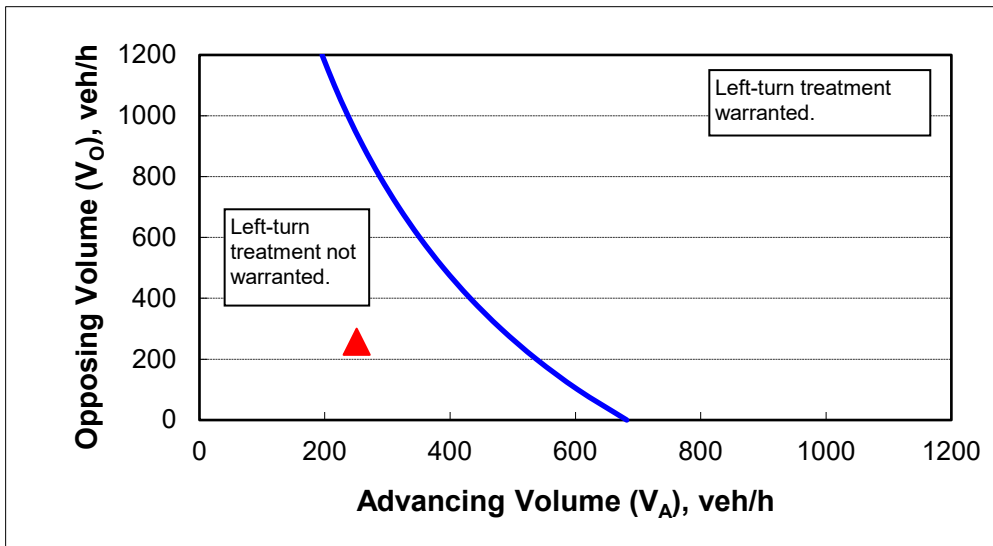
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	35
Percent of left-turns in advancing volume ( $V_A$ ), %:	8%
Advancing volume ( $V_A$ ), veh/h:	251
Opposing volume ( $V_O$ ), veh/h:	257

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	505
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



#### CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

## Left-Turn Lane Warrant Analysis



Project: Wood Duck Springs CP/Zone Map Change  
 Intersection: 3. NE 63rd Street at NE 81st Avenue  
 Date: 11/12/2023  
 Scenario: 2026 Buildout Conditions with Proposed Zone - PM Peak Hour (EB)

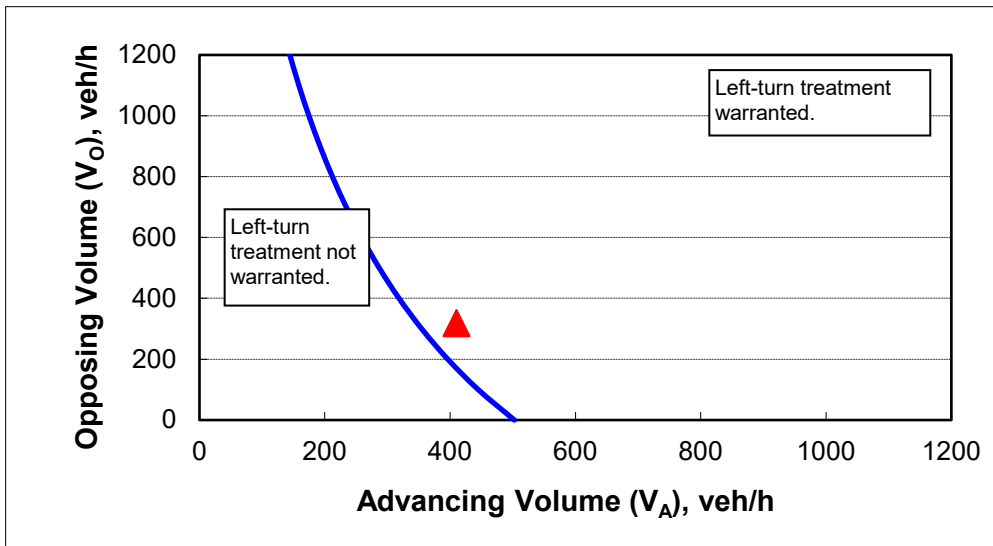
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	35
Percent of left-turns in advancing volume ( $V_A$ ), %:	16%
Advancing volume ( $V_A$ ), veh/h:	410
Opposing volume ( $V_O$ ), veh/h:	319

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	347
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment warranted.</b>	



#### CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

## Left-Turn Lane Warrant Analysis



Project: Wood Duck Springs CP/Zone Map Change  
 Intersection: 4. NE 58th Street at NE 81st Avenue  
 Date: 11/12/2023  
 Scenario: 2031 Future Conditions with Proposed Zone - AM Peak Hour (EB)

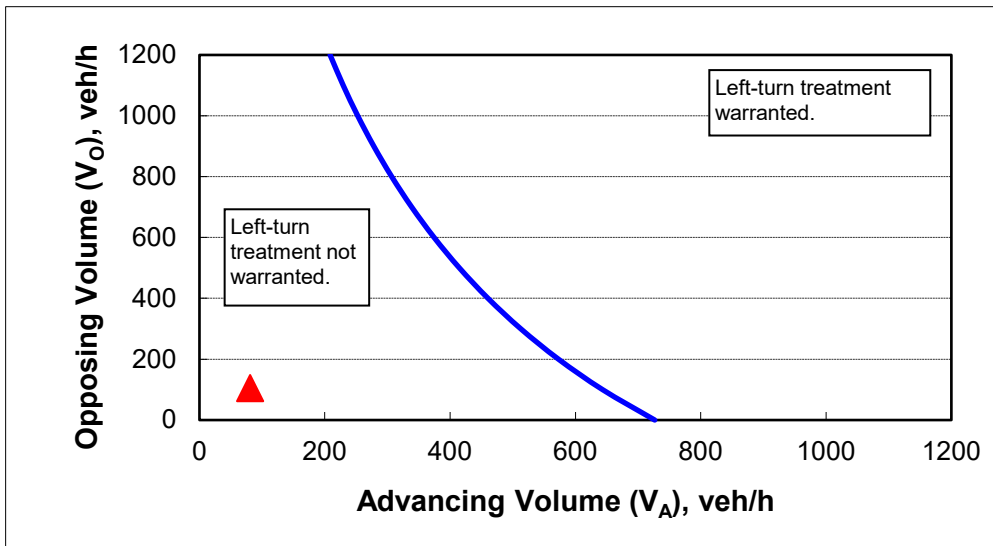
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	25
Percent of left-turns in advancing volume ( $V_A$ ), %:	9%
Advancing volume ( $V_A$ ), veh/h:	81
Opposing volume ( $V_O$ ), veh/h:	105

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	640
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



#### CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

## Left-Turn Lane Warrant Analysis



Project: Wood Duck Springs CP/Zone Map Change  
 Intersection: 4. NE 58th Street at NE 81st Avenue  
 Date: 11/12/2023  
 Scenario: 2031 Future Conditions with Proposed Zone - PM Peak Hour (EB)

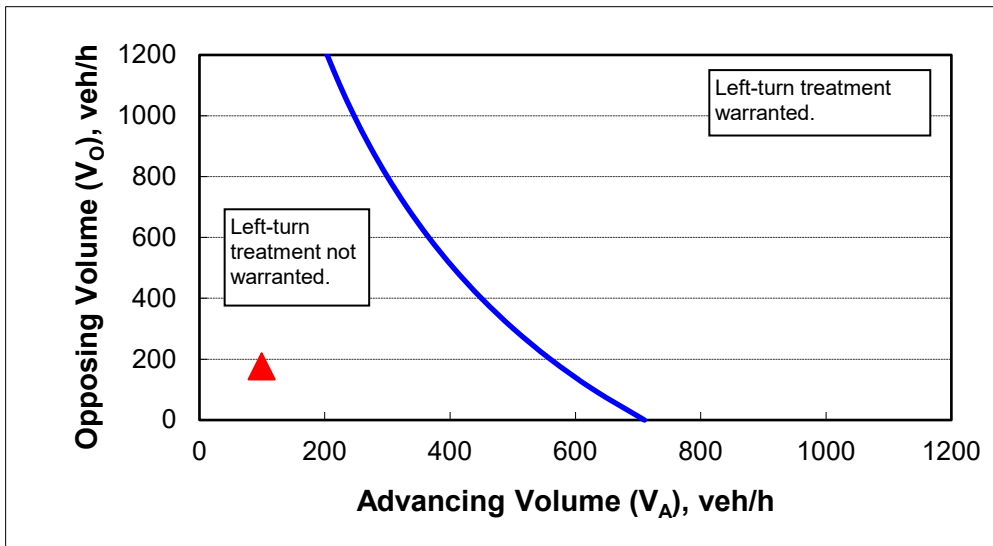
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	25
Percent of left-turns in advancing volume ( $V_A$ ), %:	9%
Advancing volume ( $V_A$ ), veh/h:	99
Opposing volume ( $V_O$ ), veh/h:	177

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	575
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



#### CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9



## Left-Turn Lane Warrant Analysis



Project: Wood Duck Springs CP/Zone Map Change  
 Intersection: 5. NE 58th Street at NE 82nd Avenue  
 Date: 11/12/2023  
 Scenario: 2031 Future Conditions with Proposed Zone - AM Peak Hour (EB)

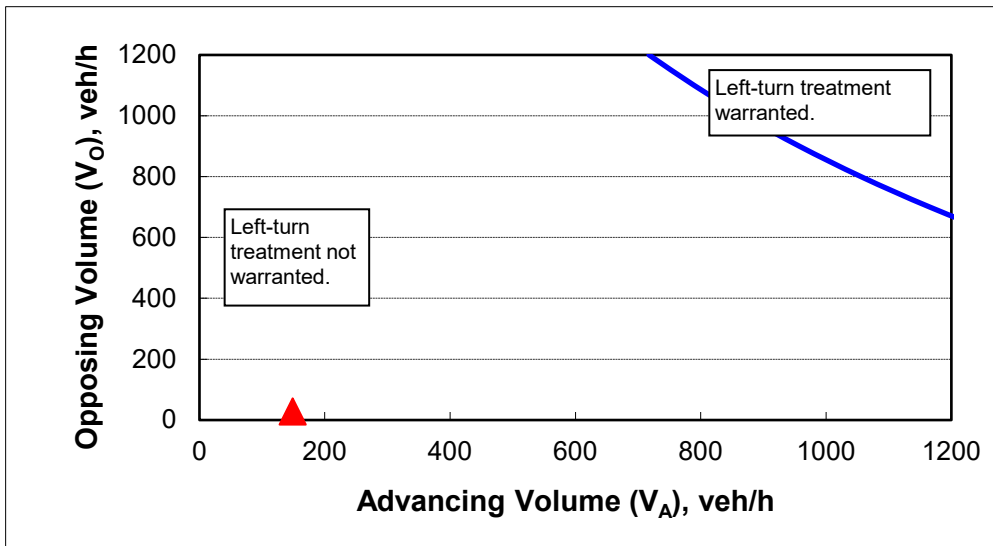
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	25
Percent of left-turns in advancing volume ( $V_A$ ), %:	1%
Advancing volume ( $V_A$ ), veh/h:	149
Opposing volume ( $V_O$ ), veh/h:	28

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	2415
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



#### CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

## Left-Turn Lane Warrant Analysis



Project: Wood Duck Springs CP/Zone Map Change  
 Intersection: 5. NE 58th Street at NE 82nd Avenue  
 Date: 11/12/2023  
 Scenario: 2031 Future Conditions with Proposed Zone - AM Peak Hour (WB)

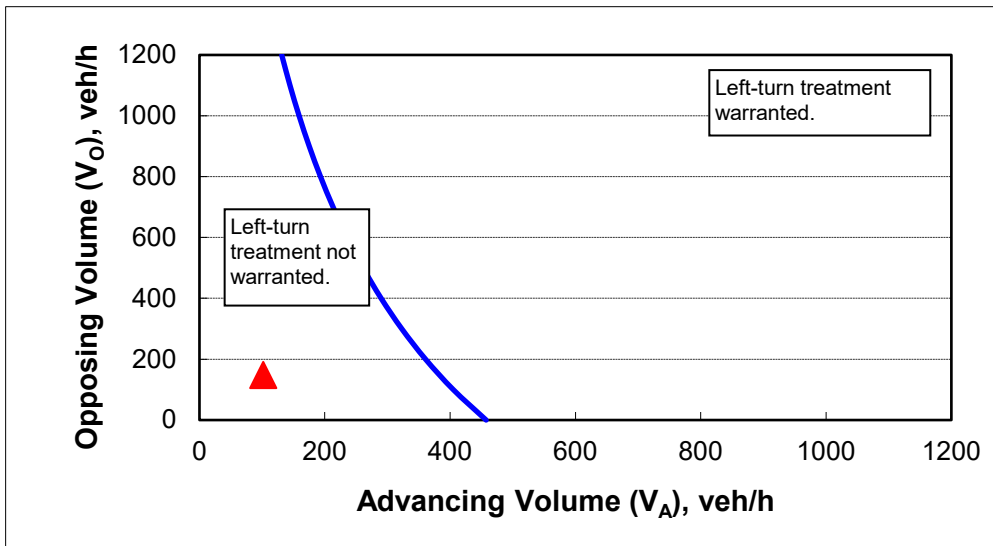
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	25
Percent of left-turns in advancing volume ( $V_A$ ), %:	73%
Advancing volume ( $V_A$ ), veh/h:	102
Opposing volume ( $V_O$ ), veh/h:	148

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	383
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



#### CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

## Left-Turn Lane Warrant Analysis



Project: Wood Duck Springs CP/Zone Map Change  
 Intersection: 5. NE 58th Street at NE 82nd Avenue  
 Date: 11/12/2023  
 Scenario: 2031 Future Conditions with Proposed Zone - PM Peak Hour (EB)

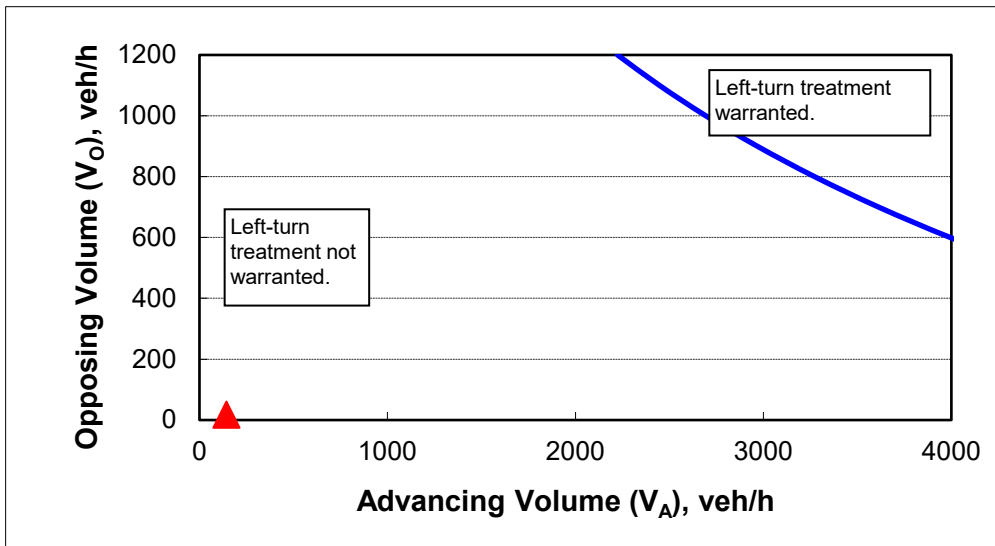
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	25
Percent of left-turns in advancing volume ( $V_A$ ), %:	0%
Advancing volume ( $V_A$ ), veh/h:	144
Opposing volume ( $V_O$ ), veh/h:	18

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	7578
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



#### CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

## Left-Turn Lane Warrant Analysis



Project: Wood Duck Springs CP/Zone Map Change  
 Intersection: 5. NE 58th Street at NE 82nd Avenue  
 Date: 11/12/2023  
 Scenario: 2031 Future Conditions with Proposed Zone - PM Peak Hour (WB)

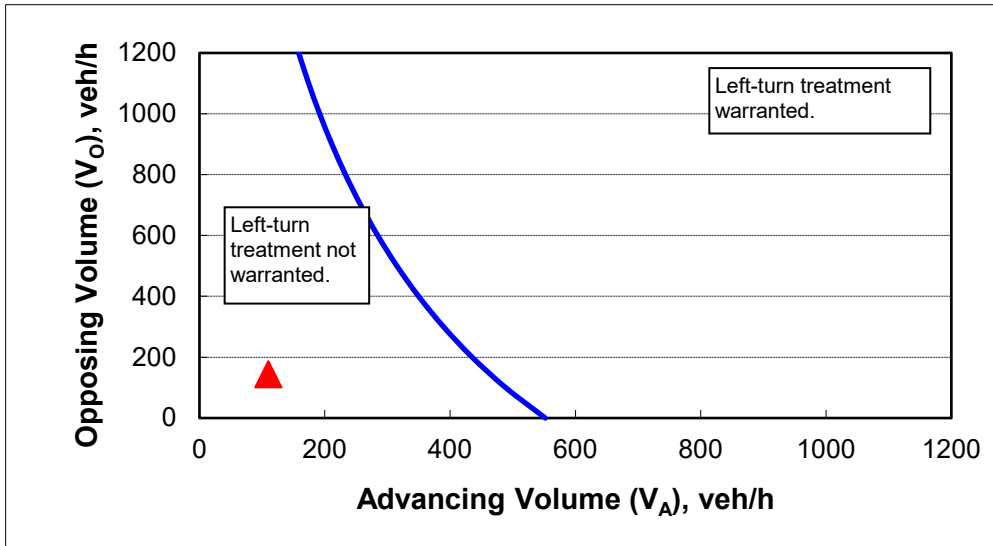
### 2-lane roadway (English)

#### INPUT

Variable	Value
85 <sup>th</sup> percentile speed, mph:	25
Percent of left-turns in advancing volume ( $V_A$ ), %:	84%
Advancing volume ( $V_A$ ), veh/h:	110
Opposing volume ( $V_O$ ), veh/h:	144

#### OUTPUT

Variable	Value
Limiting advancing volume ( $V_A$ ), veh/h:	464
<b>Guidance for determining the need for a major-road left-turn bay:</b>	
<b>Left-turn treatment NOT warranted.</b>	



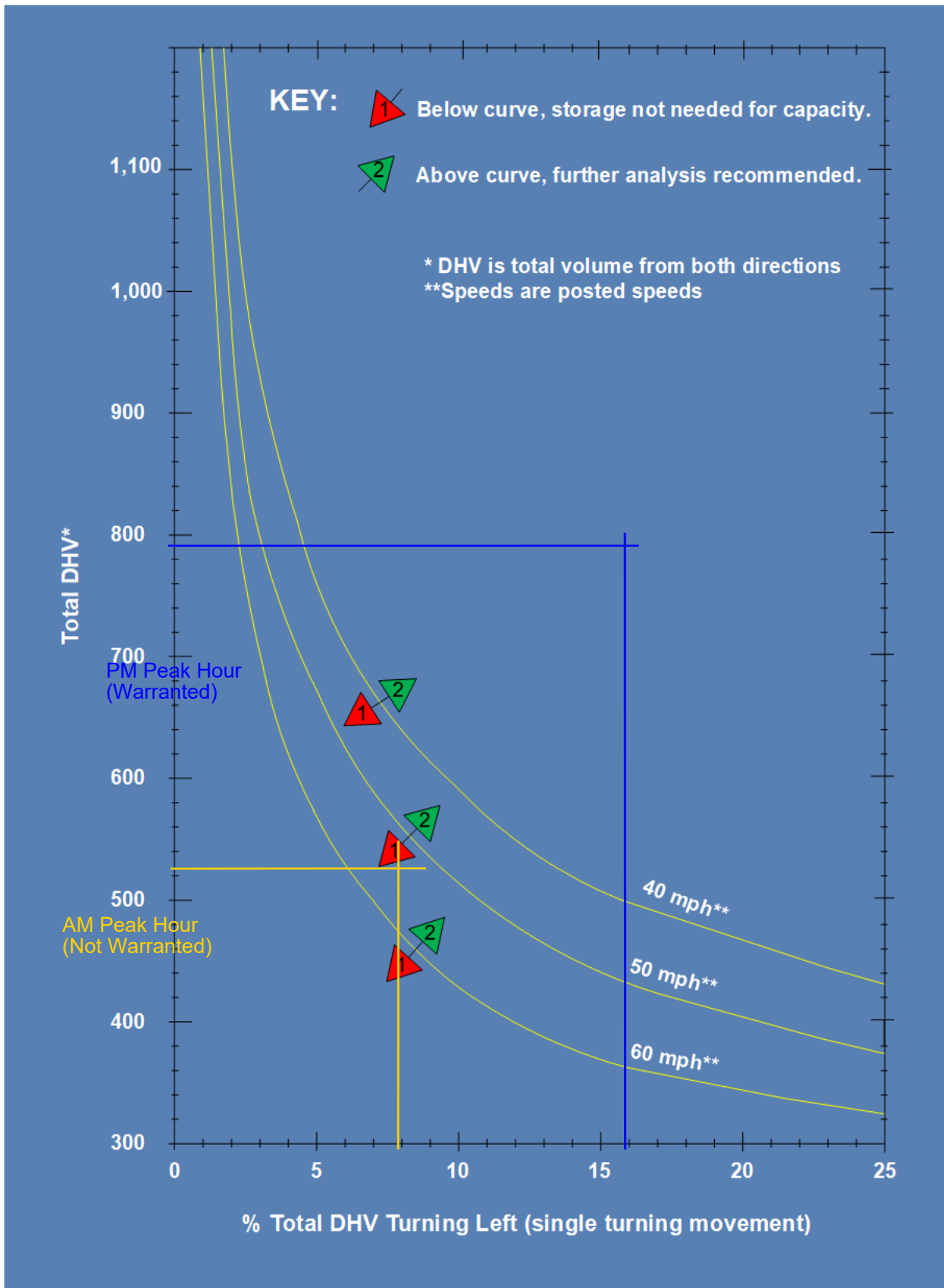
#### CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

### 3. NE 63rd Street at NE 81st Avenue (2031 with Zone Change)

Chapter 1310

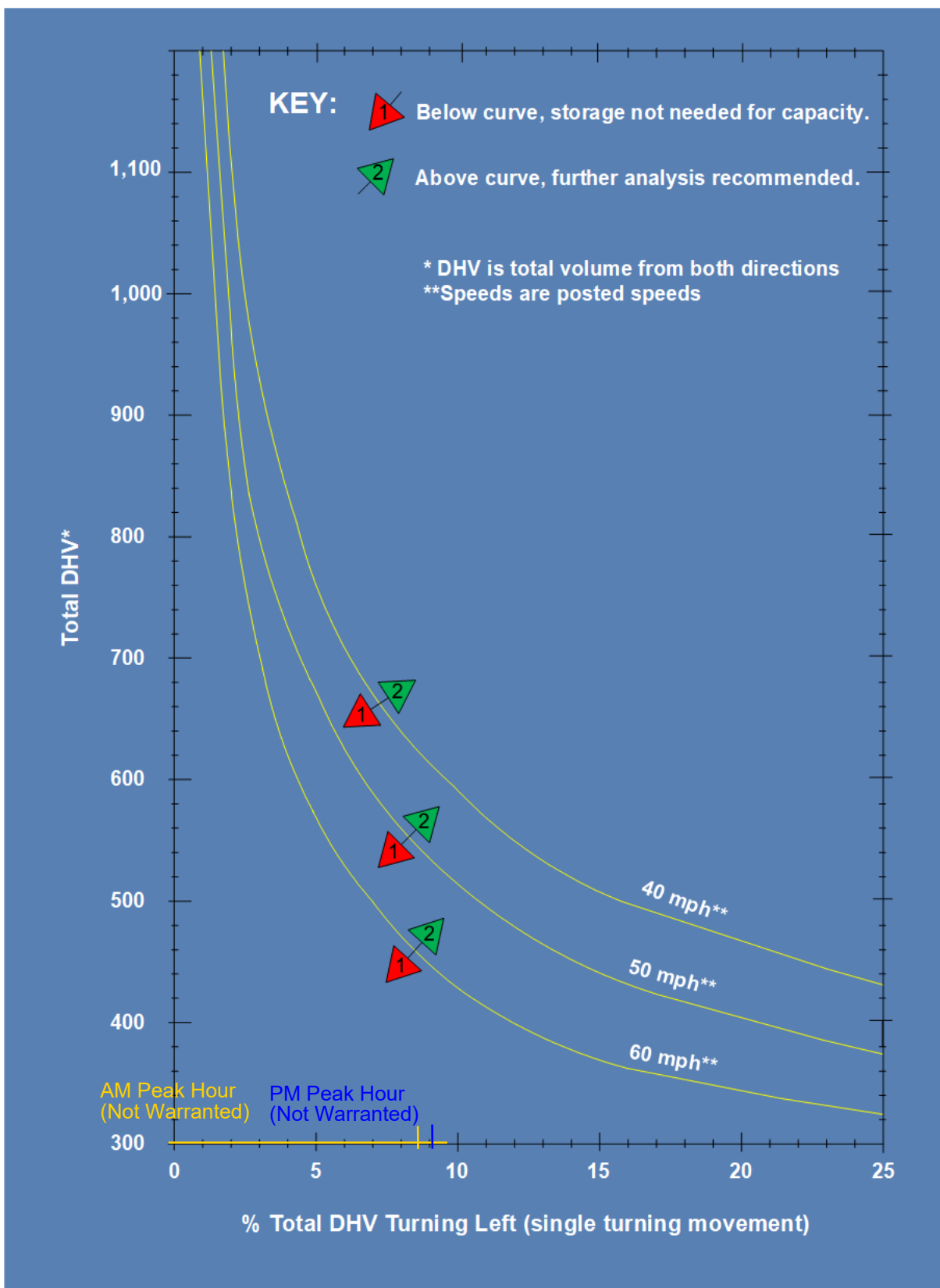
Exhibit 1310-9 Left-Turn Storage Guidelines: Two-Lane, Unsignalized



# 4. NE 58th Street at NE 81st Avenue (2031 with Zone Change)

## Chapter 1310

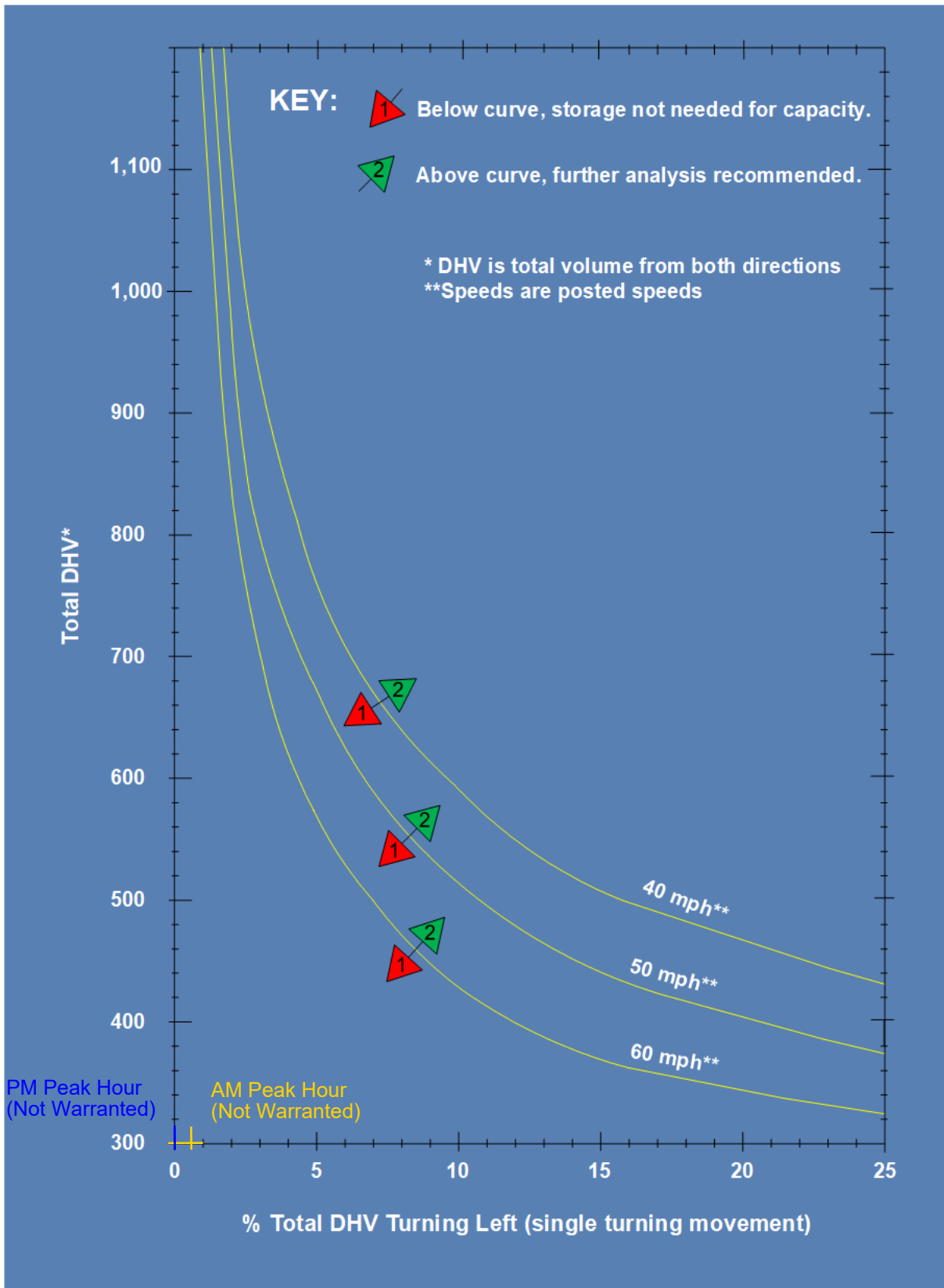
### Exhibit 1310-9 Left-Turn Storage Guidelines: Two-Lane, Unsignalized



# 5. NE 58th Street at NE 82nd Avenue (EB) (2031 with Zone Change)

Chapter 1310

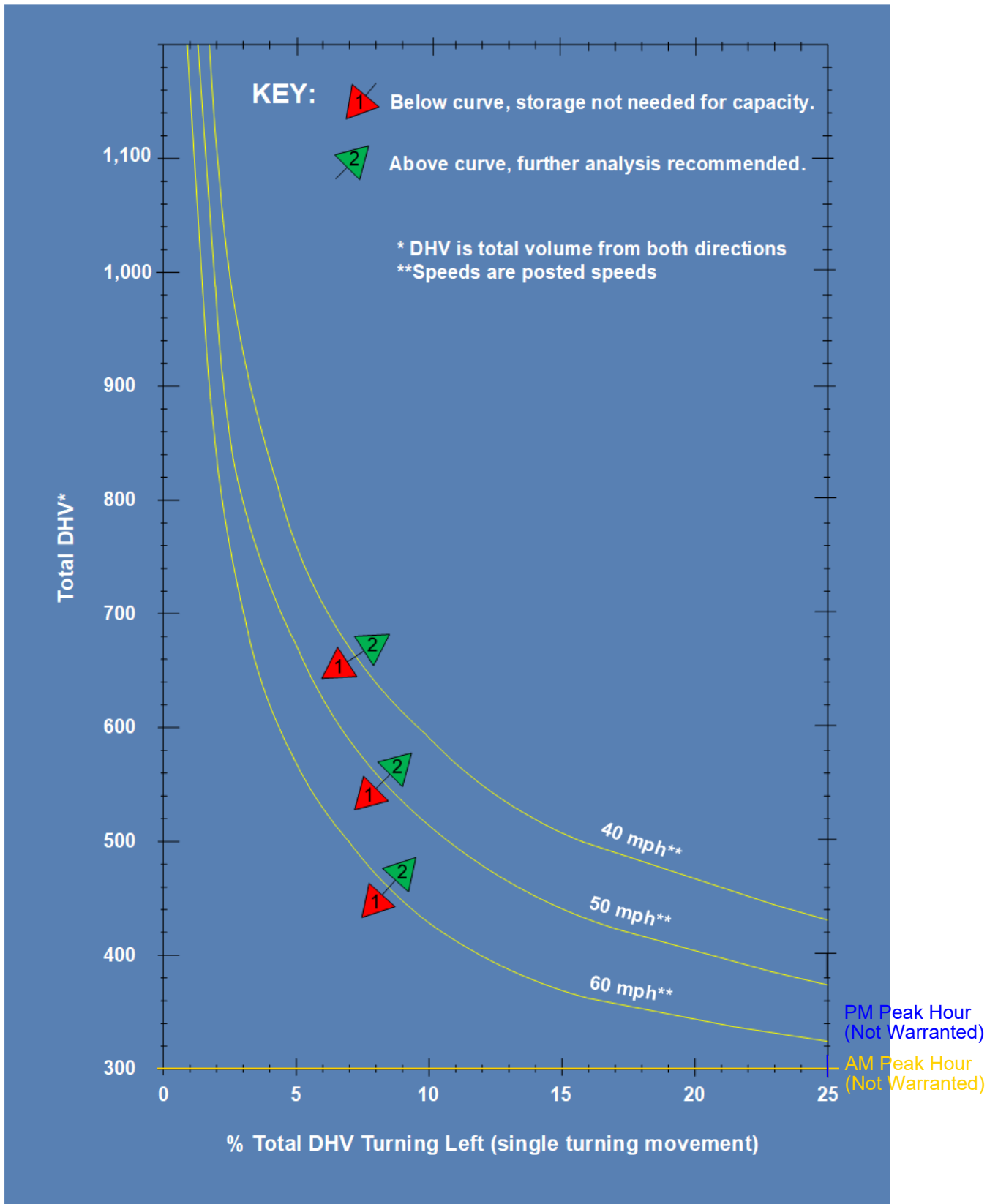
Exhibit 1310-9 Left-Turn Storage Guidelines: Two-Lane, Unsignalized



5. NE 58th Street at NE 82nd Avenue (WB)  
(2031 with Zone Change)

Chapter 1310

Exhibit 1310-9 Left-Turn Storage Guidelines: Two-Lane, Unsignalized





# Traffic Signal Warrant Analysis



Project: Wood Duck Springs CP/Zone Map Change  
 Date: 11/12/2023  
 Scenario: 2031 Future Conditions with Proposed Zones

Major Street:	NE 63rd Street	Minor Street:	NE 81st Avenue
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	793	PM Peak Hour Volumes:	64

Warrant Used:  
 100 percent of standard warrants used  
 70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
Major St.	Minor St.	100% Warrants	70% Warrants	100% Warrants	70% Warrants
<b>WARRANT 1, CONDITION A</b>					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	7,400	2,650	1,850
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	11,100	1,350	950
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<b>Warrant 1</b>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	7,930	8,850	
Minor Street*	640	2,650	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	7,930	13,300	
Minor Street*	640	1,350	<b>No</b>
<i>Combination Warrant</i>			
Major Street	7,930	10,640	
Minor Street*	640	2,120	<b>No</b>

Note: Minor street right-turning traffic volumes reduced by 25%.

# Traffic Signal Warrant Analysis



Project: Wood Duck Springs CP/Zone Map Change  
 Date: 11/12/2023  
 Scenario: 2031 Future Conditions with Proposed Zones

Major Street:	NE 58th Street	Minor Street:	NE 81st Avenue
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	276	PM Peak Hour Volumes:	76

**Warrant Used:**

    X     100 percent of standard warrants used  
           70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
<u>Major St.</u>	<u>Minor St.</u>	<u>100% Warrants</u>	<u>70% Warrants</u>	<u>100% Warrants</u>	<u>70% Warrants</u>
<b>WARRANT 1, CONDITION A</b>					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	<b>7,400</b>	2,650	<b>1,850</b>
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	<b>11,100</b>	1,350	<b>950</b>
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<b>Warrant 1</b>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	2,760	8,850	
Minor Street*	760	2,650	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	2,760	13,300	
Minor Street*	760	1,350	<b>No</b>
<i>Combination Warrant</i>			
Major Street	2,760	10,640	
Minor Street*	760	2,120	<b>No</b>

Note: Minor street right-turning traffic volumes reduced by 25%.

# Traffic Signal Warrant Analysis



Project: Wood Duck Springs CP/Zone Map Change  
 Date: 11/12/2023  
 Scenario: 2031 Future Conditions with Proposed Zones

Major Street:	NE 58th Street	Minor Street:	NE 82nd Avenue
Number of Lanes:	1	Number of Lanes:	1
PM Peak Hour Volumes:	254	PM Peak Hour Volumes:	266

**Warrant Used:**

    X     100 percent of standard warrants used  
           70 percent of standard warrants used due to 85th percentile speed in excess of 40 mph or isolated community with population less than 10,000.

Number of Lanes for Moving Traffic on Each Approach:		ADT on Major St. (total of both approaches)		ADT on Minor St. (higher-volume approach)	
<u>Major St.</u>	<u>Minor St.</u>	<u>100% Warrants</u>	<u>70% Warrants</u>	<u>100% Warrants</u>	<u>70% Warrants</u>
<b>WARRANT 1, CONDITION A</b>					
1	1	8,850	6,200	2,650	1,850
2 or more	1	10,600	<b>7,400</b>	2,650	<b>1,850</b>
2 or more	2 or more	10,600	7,400	3,550	2,500
1	2 or more	8,850	6,200	3,550	2,500
<b>WARRANT 1, CONDITION B</b>					
1	1	13,300	9,300	1,350	950
2 or more	1	15,900	<b>11,100</b>	1,350	<b>950</b>
2 or more	2 or more	15,900	11,100	1,750	1,250
1	2 or more	13,300	9,300	1,750	1,250

Note: ADT volumes assume 8th highest hour is 5.6% of the daily volume

	Approach Volumes	Minimum Volumes	Is Signal Warrant Met?
<b>Warrant 1</b>			
<i>Condition A: Minimum Vehicular Volume</i>			
Major Street	2,540	8,850	
Minor Street*	2,660	2,650	<b>No</b>
<i>Condition B: Interruption of Continuous Traffic</i>			
Major Street	2,540	13,300	
Minor Street*	2,660	1,350	<b>No</b>
<i>Combination Warrant</i>			
Major Street	2,540	10,640	
Minor Street*	2,660	2,120	<b>No</b>

Note: Minor street right-turning traffic volumes reduced by 25%.

## Appendix D – Operation Analysis

Level of Service Descriptions

Capacity Reports





## LEVEL OF SERVICE

Level of service is used to describe the quality of traffic flow. Levels of service A to C are considered good, and rural roads are usually designed for level of service C. Urban streets and signalized intersections are typically designed for level of service D. Level of service E is considered to be the limit of acceptable delay. For unsignalized intersections, level of service E is generally considered acceptable. Here is a more complete description of levels of service:

*Level of service A:* Very low delay at intersections, with all traffic signal cycles clearing and no vehicles waiting through more than one signal cycle. On highways, low volume and high speeds, with speeds not restricted by other vehicles.

*Level of service B:* Operating speeds beginning to be affected by other traffic; short traffic delays at intersections. Higher average intersection delay than for level of service A resulting from more vehicles stopping.

*Level of service C:* Operating speeds and maneuverability closely controlled by other traffic; higher delays at intersections than for level of service B due to a significant number of vehicles stopping. Not all signal cycles clear the waiting vehicles. This is the recommended design standard for rural highways.

*Level of service D:* Tolerable operating speeds; long traffic delays occur at intersections. The influence of congestion is noticeable. At traffic signals many vehicles stop, and the proportion of vehicles not stopping declines. The number of signal cycle failures, for which vehicles must wait through more than one signal cycle, are noticeable. This is typically the design level for urban signalized intersections.

*Level of service E:* Restricted speeds, very long traffic delays at traffic signals, and traffic volumes near capacity. Flow is unstable so that any interruption, no matter how minor, will cause queues to form and service to deteriorate to level of service F. Traffic signal cycle failures are frequent occurrences. For unsignalized intersections, level of service E or better is generally considered acceptable.

*Level of service F:* Extreme delays, resulting in long queues which may interfere with other traffic movements. There may be stoppages of long duration, and speeds may drop to zero. There may be frequent signal cycle failures. Level of service F will typically result when vehicle arrival rates are greater than capacity. It is considered unacceptable by most drivers.



*LEVEL OF SERVICE CRITERIA  
FOR SIGNALIZED INTERSECTIONS*

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-20
C	20-35
D	35-55
E	55-80
F	>80

























*LEVEL OF SERVICE CRITERIA  
FOR UNSIGNALIZED INTERSECTIONS*

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds)
A	<10
B	10-15
C	15-25
D	25-35
E	35-50
F	>50

# HCM Signalized Intersection Capacity Analysis

## 1: NE Andresen Road & NE 63rd Street

10/16/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (vph)	92	147	165	129	175	63	151	376	53	40	544	94
Future Volume (vph)	92	147	165	129	175	63	151	376	53	40	544	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.96		1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1656	3023		1719	3302		1736	3401		1703	3330	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1656	3023		1719	3302		1736	3401		1703	3330	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	100	160	179	140	190	68	164	409	58	43	591	102
RTOR Reduction (vph)	0	146	0	0	53	0	0	13	0	0	19	0
Lane Group Flow (vph)	100	193	0	140	205	0	164	454	0	43	674	0
Confl. Peds. (#/hr)			3	3								
Confl. Bikes (#/hr)			1						2			
Heavy Vehicles (%)	9%	9%	9%	5%	5%	5%	4%	4%	4%	6%	6%	6%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.4	13.0		8.9	15.5		12.3	27.2		4.9	19.8	
Effective Green, g (s)	6.4	13.0		8.9	15.5		12.3	27.2		4.9	19.8	
Actuated g/C Ratio	0.09	0.19		0.13	0.22		0.18	0.39		0.07	0.28	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	151	561		218	731		305	1321		119	941	
v/s Ratio Prot	0.06	c0.06		c0.08	0.06		c0.09	0.13		0.03	c0.20	
v/s Ratio Perm												
v/c Ratio	0.66	0.34		0.64	0.28		0.54	0.34		0.36	0.72	
Uniform Delay, d1	30.8	24.8		29.0	22.6		26.3	15.1		31.1	22.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.4	1.7		6.3	1.0		1.8	0.2		1.9	2.6	
Delay (s)	41.2	26.5		35.4	23.6		28.1	15.3		32.9	25.2	
Level of Service	D	C		D	C		C	B		C	C	
Approach Delay (s)		29.8			27.7			18.6			25.6	
Approach LOS		C			C			B			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			24.8				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.56									
Actuated Cycle Length (s)			70.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			61.9%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM 6th Signalized Intersection Summary

## 1: NE Andresen Road & NE 63rd Street

10/16/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷		↶	↷		↶	↷	
Traffic Volume (veh/h)	92	147	165	129	175	63	151	376	53	40	544	94
Future Volume (veh/h)	92	147	165	129	175	63	151	376	53	40	544	94
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		1.00	1.00		0.99	1.00		1.00
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	1767	1767	1767	1826	1826	1826	1841	1841	1841	1811	1811	1811
Adj Flow Rate, veh/h	100	160	33	140	190	15	164	409	45	43	591	84
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	9	9	9	5	5	5	4	4	4	6	6	6
Cap, veh/h	126	897	180	175	1136	89	200	976	107	70	707	100
Arrive On Green	0.07	0.32	0.32	0.10	0.35	0.35	0.11	0.31	0.31	0.04	0.23	0.23
Sat Flow, veh/h	1682	2776	559	1739	3259	255	1753	3174	347	1725	3025	429
Grp Volume(v), veh/h	100	95	98	140	100	105	164	224	230	43	336	339
Grp Sat Flow(s),veh/h/ln	1682	1678	1656	1739	1735	1779	1753	1749	1773	1725	1721	1734
Q Serve(g_s), s	4.1	2.8	3.0	5.5	2.8	2.8	6.4	7.1	7.2	1.7	13.0	13.1
Cycle Q Clear(g_c), s	4.1	2.8	3.0	5.5	2.8	2.8	6.4	7.1	7.2	1.7	13.0	13.1
Prop In Lane	1.00		0.34	1.00		0.14	1.00		0.20	1.00		0.25
Lane Grp Cap(c), veh/h	126	542	535	175	605	621	200	538	545	70	402	405
V/C Ratio(X)	0.79	0.18	0.18	0.80	0.17	0.17	0.82	0.42	0.42	0.62	0.83	0.84
Avail Cap(c_a), veh/h	168	542	535	199	605	621	200	538	545	150	455	458
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	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.9	17.0	17.0	30.8	15.8	15.8	30.3	19.3	19.3	33.0	25.5	25.6
Incr Delay (d2), s/veh	17.0	0.7	0.8	17.7	0.6	0.6	22.7	0.5	0.5	8.5	11.5	11.8
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	2.2	1.1	1.1	3.0	1.1	1.2	3.8	2.7	2.8	0.8	6.1	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.9	17.7	17.8	48.5	16.3	16.3	53.0	19.8	19.8	41.6	37.1	37.3
LnGrp LOS	D	B	B	D	B	B	D	B	B	D	D	D
Approach Vol, veh/h		293			345			618			718	
Approach Delay, s/veh		28.4			29.4			28.6			37.5	
Approach LOS		C			C			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	26.6	12.0	20.4	9.2	28.4	6.8	25.5				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	8.0	19.5	8.0	18.5	7.0	20.5	6.1	20.4				
Max Q Clear Time (g_c+I1), s	7.5	5.0	8.4	15.1	6.1	4.8	3.7	9.2				
Green Ext Time (p_c), s	0.0	0.8	0.0	1.3	0.0	0.9	0.0	1.9				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				31.9								
HCM 6th LOS				C								



# HCM Signalized Intersection Capacity Analysis

## 2: NE 72nd Avenue & NE 63rd Street

10/16/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	122	49	48	220	19	113	56	62	16	76	61
Future Volume (vph)	35	122	49	48	220	19	113	56	62	16	76	61
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.92		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1699	1792	1490	1701	1767		1669	1590		1670	1647	
Flt Permitted	0.60	1.00	1.00	0.65	1.00		0.64	1.00		0.67	1.00	
Satd. Flow (perm)	1071	1792	1490	1157	1767		1127	1590		1187	1647	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	38	133	53	52	239	21	123	61	67	17	83	66
RTOR Reduction (vph)	0	0	24	0	4	0	0	54	0	0	53	0
Lane Group Flow (vph)	38	133	29	52	256	0	123	74	0	17	96	0
Confl. Peds. (#/hr)	3		1	1		3	2		7	7		2
Confl. Bikes (#/hr)			1						3			
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	8%	8%	8%	7%	7%	7%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	35.0	32.3	32.3	37.6	33.6		11.7	11.7		11.7	11.7	
Effective Green, g (s)	35.0	32.3	32.3	37.6	33.6		11.7	11.7		11.7	11.7	
Actuated g/C Ratio	0.58	0.54	0.54	0.63	0.56		0.19	0.19		0.19	0.19	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	653	964	802	761	989		219	310		231	321	
v/s Ratio Prot	0.00	0.07		c0.00	c0.15			0.05			0.06	
v/s Ratio Perm	0.03		0.02	0.04			c0.11			0.01		
v/c Ratio	0.06	0.14	0.04	0.07	0.26		0.56	0.24		0.07	0.30	
Uniform Delay, d1	5.3	6.9	6.5	4.3	6.8		21.8	20.4		19.7	20.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3	0.1	0.0	0.1		3.3	0.4		0.1	0.5	
Delay (s)	5.4	7.2	6.6	4.4	6.9		25.1	20.8		19.9	21.2	
Level of Service	A	A	A	A	A		C	C		B	C	
Approach Delay (s)		6.8			6.5			22.9			21.0	
Approach LOS		A			A			C			C	

### Intersection Summary

HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary  
 2: NE 72nd Avenue & NE 63rd Street

10/16/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	122	49	48	220	19	113	56	62	16	76	61
Future Volume (veh/h)	35	122	49	48	220	19	113	56	62	16	76	61
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		1.00	0.99		0.97	0.99		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	1811	1811	1811	1811	1811	1811	1781	1781	1781	1796	1796	1796
Adj Flow Rate, veh/h	38	133	29	52	239	17	123	61	13	17	83	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	6	6	8	8	8	7	7	7
Cap, veh/h	721	1005	832	818	942	67	303	279	59	323	298	47
Arrive On Green	0.04	0.55	0.55	0.05	0.56	0.56	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1725	1811	1499	1725	1670	119	1221	1416	302	1262	1512	237
Grp Volume(v), veh/h	38	133	29	52	0	256	123	0	74	17	0	96
Grp Sat Flow(s),veh/h/ln	1725	1811	1499	1725	0	1789	1221	0	1718	1262	0	1749
Q Serve(g_s), s	0.5	2.1	0.5	0.7	0.0	4.4	5.7	0.0	2.2	0.7	0.0	2.8
Cycle Q Clear(g_c), s	0.5	2.1	0.5	0.7	0.0	4.4	8.5	0.0	2.2	2.9	0.0	2.8
Prop In Lane	1.00		1.00	1.00		0.07	1.00		0.18	1.00		0.14
Lane Grp Cap(c), veh/h	721	1005	832	818	0	1009	303	0	338	323	0	344
V/C Ratio(X)	0.05	0.13	0.03	0.06	0.00	0.25	0.41	0.00	0.22	0.05	0.00	0.28
Avail Cap(c_a), veh/h	826	1005	832	907	0	1009	470	0	573	495	0	583
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)	0.91	0.91	0.91	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.2	6.4	6.1	4.9	0.0	6.7	24.1	0.0	20.2	21.4	0.0	20.5
Incr Delay (d2), s/veh	0.0	0.2	0.1	0.0	0.0	0.1	0.9	0.0	0.3	0.1	0.0	0.4
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	0.1	0.7	0.1	0.2	0.0	1.3	1.6	0.0	0.8	0.2	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.2	6.7	6.1	4.9	0.0	6.8	25.0	0.0	20.5	21.5	0.0	20.9
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h		200			308			197				113
Approach Delay, s/veh		6.3			6.5			23.3				21.0
Approach LOS		A			A			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.9	37.3		15.8	6.3	37.8		15.8				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	6.0	22.0		20.0	6.0	22.0		20.0				
Max Q Clear Time (g_c+I1), s	2.7	4.1		10.5	2.5	6.4		4.9				
Green Ext Time (p_c), s	0.0	0.7		0.5	0.0	1.2		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay				12.5								
HCM 6th LOS				B								

HCM 6th TWSC  
 3: NE 81st Avenue & NE 63rd Street

10/16/2023

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	162	37	14	213	33	9
Future Vol, veh/h	162	37	14	213	33	9
Conflicting Peds, #/hr	0	2	2	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	5	5
Mvmt Flow	176	40	15	232	36	10

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	218	0	461 198
Stage 1	-	-	-	-	198 -
Stage 2	-	-	-	-	263 -
Critical Hdwy	-	-	4.18	-	6.45 6.25
Critical Hdwy Stg 1	-	-	-	-	5.45 -
Critical Hdwy Stg 2	-	-	-	-	5.45 -
Follow-up Hdwy	-	-	2.272	-	3.545 3.345
Pot Cap-1 Maneuver	-	-	1317	-	553 836
Stage 1	-	-	-	-	828 -
Stage 2	-	-	-	-	774 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1314	-	545 834
Mov Cap-2 Maneuver	-	-	-	-	545 -
Stage 1	-	-	-	-	826 -
Stage 2	-	-	-	-	765 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	589	-	-	1314	-
HCM Lane V/C Ratio	0.078	-	-	0.012	-
HCM Control Delay (s)	11.6	-	-	7.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	6	60	65	26	67	11
Future Vol, veh/h	6	60	65	26	67	11
Conflicting Peds, #/hr	1	0	0	1	1	1
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	11	11	5	5
Mvmt Flow	7	65	71	28	73	12

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	100	0	-	0	166 87
Stage 1	-	-	-	-	86 -
Stage 2	-	-	-	-	80 -
Critical Hdwy	4.12	-	-	-	6.45 6.25
Critical Hdwy Stg 1	-	-	-	-	5.45 -
Critical Hdwy Stg 2	-	-	-	-	5.45 -
Follow-up Hdwy	2.218	-	-	-	3.545 3.345
Pot Cap-1 Maneuver	1493	-	-	-	818 963
Stage 1	-	-	-	-	930 -
Stage 2	-	-	-	-	936 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1492	-	-	-	812 961
Mov Cap-2 Maneuver	-	-	-	-	812 -
Stage 1	-	-	-	-	924 -
Stage 2	-	-	-	-	935 -

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1492	-	-	-	830
HCM Lane V/C Ratio	0.004	-	-	-	0.102
HCM Control Delay (s)	7.4	0	-	-	9.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.3

HCM 6th TWSC  
5: NE 82nd Avenue & NE 58th Street

10/16/2023

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	13	109	65	25	0	70	2	23	0	2	0
Future Vol, veh/h	1	13	109	65	25	0	70	2	23	0	2	0
Conflicting Peds, #/hr	5	0	0	0	0	5	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	3	3	6	6	6	50	50	50
Mvmt Flow	1	14	118	71	27	0	76	2	25	0	2	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	32	0	0	132	0	0	245	249	73	263	308	32
Stage 1	-	-	-	-	-	-	75	75	-	174	174	-
Stage 2	-	-	-	-	-	-	170	174	-	89	134	-
Critical Hdwy	4.12	-	-	4.13	-	-	7.16	6.56	6.26	7.6	7	6.7
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.6	6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.6	6	-
Follow-up Hdwy	2.218	-	-	2.227	-	-	3.554	4.054	3.354	3.95	4.45	3.75
Pot Cap-1 Maneuver	1580	-	-	1447	-	-	701	647	978	602	534	920
Stage 1	-	-	-	-	-	-	924	825	-	728	673	-
Stage 2	-	-	-	-	-	-	823	747	-	813	702	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1572	-	-	1447	-	-	672	611	978	560	504	916
Mov Cap-2 Maneuver	-	-	-	-	-	-	672	611	-	560	504	-
Stage 1	-	-	-	-	-	-	923	824	-	724	636	-
Stage 2	-	-	-	-	-	-	779	706	-	789	701	-

























Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	5.5	10.8	12.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	725	1572	-	-	1447	-	-	504
HCM Lane V/C Ratio	0.142	0.001	-	-	0.049	-	-	0.004
HCM Control Delay (s)	10.8	7.3	0	-	7.6	0	-	12.2
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0.2	-	-	0

# HCM Signalized Intersection Capacity Analysis

## 1: NE Andresen Road & NE 63rd Street





















10/16/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (vph)	152	258	225	144	192	84	320	752	95	65	597	149
Future Volume (vph)	152	258	225	144	192	84	320	752	95	65	597	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.95		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3286		1752	3329		1770	3475		1752	3389	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	3286		1752	3329		1770	3475		1752	3389	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	163	277	242	155	206	90	344	809	102	70	642	160
RTOR Reduction (vph)	0	185	0	0	57	0	0	10	0	0	23	0
Lane Group Flow (vph)	163	334	0	155	239	0	344	901	0	70	779	0
Confl. Peds. (#/hr)	1		7	7		1	2					2
Confl. Bikes (#/hr)			2			2			1			1
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	10.4	17.5		10.3	17.4		21.6	38.8		7.4	24.6	
Effective Green, g (s)	10.4	17.5		10.3	17.4		21.6	38.8		7.4	24.6	
Actuated g/C Ratio	0.12	0.19		0.11	0.19		0.24	0.43		0.08	0.27	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	206	638		200	643		424	1498		144	926	
v/s Ratio Prot	c0.09	c0.10		0.09	0.07		c0.19	0.26		0.04	c0.23	
v/s Ratio Perm												
v/c Ratio	0.79	0.52		0.78	0.37		0.81	0.60		0.49	0.84	
Uniform Delay, d1	38.7	32.5		38.7	31.5		32.3	19.7		39.5	30.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	18.4	3.1		16.9	1.6		11.2	0.7		2.6	7.0	
Delay (s)	57.2	35.6		55.7	33.2		43.5	20.4		42.1	37.8	
Level of Service	E	D		E	C		D	C		D	D	
Approach Delay (s)		40.7			40.9			26.7			38.2	
Approach LOS		D			D			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			34.7				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.75									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			75.8%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM 6th Signalized Intersection Summary

## 1: NE Andresen Road & NE 63rd Street

10/16/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	152	258	225	144	192	84	320	752	95	65	597	149
Future Volume (veh/h)	152	258	225	144	192	84	320	752	95	65	597	149
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	1.00		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	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	163	277	57	155	206	33	344	809	92	70	642	137
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	1	1	3	3	3	2	2	2	3	3	3
Cap, veh/h	196	771	156	187	784	123	380	1298	148	90	698	149
Arrive On Green	0.11	0.26	0.26	0.11	0.26	0.26	0.21	0.40	0.40	0.05	0.24	0.24
Sat Flow, veh/h	1795	2955	598	1767	3041	479	1781	3210	365	1767	2882	614
Grp Volume(v), veh/h	163	166	168	155	118	121	344	448	453	70	392	387
Grp Sat Flow(s),veh/h/ln	1795	1791	1762	1767	1763	1757	1781	1777	1799	1767	1763	1734
Q Serve(g_s), s	8.0	6.8	7.0	7.7	4.8	4.9	16.9	18.1	18.1	3.5	19.5	19.6
Cycle Q Clear(g_c), s	8.0	6.8	7.0	7.7	4.8	4.9	16.9	18.1	18.1	3.5	19.5	19.6
Prop In Lane	1.00		0.34	1.00		0.27	1.00		0.20	1.00		0.35
Lane Grp Cap(c), veh/h	196	467	460	187	454	453	380	718	727	90	427	420
V/C Ratio(X)	0.83	0.36	0.37	0.83	0.26	0.27	0.91	0.62	0.62	0.78	0.92	0.92
Avail Cap(c_a), veh/h	199	467	460	196	454	453	416	718	727	181	431	424
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	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	27.1	27.2	39.4	26.6	26.6	34.5	21.4	21.4	42.2	33.2	33.3
Incr Delay (d2), s/veh	24.3	2.1	2.2	22.7	1.3	1.4	22.0	1.7	1.7	13.2	24.5	25.3
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	4.7	3.0	3.1	4.4	2.1	2.2	9.3	7.3	7.3	1.8	10.8	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.6	29.2	29.4	62.1	27.9	28.0	56.5	23.0	23.0	55.4	57.8	58.5
LnGrp LOS	E	C	C	E	C	C	E	C	C	E	E	E
Approach Vol, veh/h		497			394			1245			849	
Approach Delay, s/veh		40.6			41.4			32.3			57.9	
Approach LOS		D			D			C			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.5	27.5	23.2	25.8	13.8	27.2	8.6	40.4				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	10.0	21.0	21.0	22.0	10.0	21.0	9.2	33.8				
Max Q Clear Time (g_c+I1), s	9.7	9.0	18.9	21.6	10.0	6.9	5.5	20.1				
Green Ext Time (p_c), s	0.0	1.4	0.2	0.2	0.0	1.0	0.0	4.6				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			42.2									
HCM 6th LOS			D									

# HCM Signalized Intersection Capacity Analysis

## 2: NE 72nd Avenue & NE 63rd Street

10/16/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	78	288	46	20	268	18	70	88	19	26	91	72
Future Volume (vph)	78	288	46	20	268	18	70	88	19	26	91	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1786	1881	1550	1763	1842		1770	1805		1747	1713	
Flt Permitted	0.48	1.00	1.00	0.57	1.00		0.54	1.00		0.68	1.00	
Satd. Flow (perm)	912	1881	1550	1058	1842		1012	1805		1254	1713	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	85	313	50	22	291	20	76	96	21	28	99	78
RTOR Reduction (vph)	0	0	19	0	3	0	0	16	0	0	58	0
Lane Group Flow (vph)	85	313	31	22	308	0	76	101	0	28	119	0
Confl. Peds. (#/hr)	1		6	6		1			2	2		
Confl. Bikes (#/hr)			1			1						1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	42.5	37.2	37.2	34.4	33.1		9.5	9.5		9.5	9.5	
Effective Green, g (s)	42.5	37.2	37.2	34.4	33.1		9.5	9.5		9.5	9.5	
Actuated g/C Ratio	0.71	0.62	0.62	0.57	0.55		0.16	0.16		0.16	0.16	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	724	1166	961	621	1016		160	285		198	271	
v/s Ratio Prot	c0.01	c0.17		0.00	c0.17			0.06			0.07	
v/s Ratio Perm	0.07		0.02	0.02			c0.08			0.02		
v/c Ratio	0.12	0.27	0.03	0.04	0.30		0.47	0.35		0.14	0.44	
Uniform Delay, d1	3.0	5.2	4.4	5.5	7.2		23.0	22.5		21.7	22.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.6	0.1	0.0	0.2		2.2	0.8		0.3	1.1	
Delay (s)	3.0	5.8	4.5	5.6	7.4		25.2	23.3		22.1	24.0	
Level of Service	A	A	A	A	A		C	C		C	C	
Approach Delay (s)		5.1			7.3			24.0			23.7	
Approach LOS		A			A			C			C	

### Intersection Summary

HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.32		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	46.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



HCM 6th Signalized Intersection Summary  
 2: NE 72nd Avenue & NE 63rd Street

10/16/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗		↖	↗		↖	↗	
Traffic Volume (veh/h)	78	288	46	20	268	18	70	88	19	26	91	72
Future Volume (veh/h)	78	288	46	20	268	18	70	88	19	26	91	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		1.00	1.00		0.97
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	1870	1870	1870	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	85	313	32	22	291	17	76	96	5	28	99	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1	2	2	2	2	2	2	3	3	3
Cap, veh/h	760	1153	952	717	1002	59	251	287	15	267	243	49
Arrive On Green	0.06	0.61	0.61	0.03	0.57	0.57	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1795	1885	1557	1781	1747	102	1267	1762	92	1280	1490	301
Grp Volume(v), veh/h	85	313	32	22	0	308	76	0	101	28	0	119
Grp Sat Flow(s),veh/h/ln	1795	1885	1557	1781	0	1849	1267	0	1853	1280	0	1791
Q Serve(g_s), s	1.1	4.6	0.5	0.3	0.0	5.1	3.4	0.0	2.9	1.2	0.0	3.6
Cycle Q Clear(g_c), s	1.1	4.6	0.5	0.3	0.0	5.1	7.0	0.0	2.9	4.1	0.0	3.6
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.05	1.00		0.17
Lane Grp Cap(c), veh/h	760	1153	952	717	0	1061	251	0	302	267	0	292
V/C Ratio(X)	0.11	0.27	0.03	0.03	0.00	0.29	0.30	0.00	0.33	0.10	0.00	0.41
Avail Cap(c_a), veh/h	826	1153	952	850	0	1061	446	0	587	464	0	567
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)	0.78	0.78	0.78	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	4.3	5.4	4.6	4.9	0.0	6.5	25.7	0.0	22.2	24.0	0.0	22.5
Incr Delay (d2), s/veh	0.1	0.5	0.1	0.0	0.0	0.1	0.7	0.0	0.6	0.2	0.0	0.9
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	0.3	1.4	0.1	0.1	0.0	1.5	1.0	0.0	1.2	0.4	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.4	5.9	4.7	4.9	0.0	6.7	26.3	0.0	22.9	24.2	0.0	23.4
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h		430			330			177				147
Approach Delay, s/veh		5.5			6.6			24.4				23.6
Approach LOS		A			A			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	40.7		13.8	7.8	38.4		13.8				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	6.0	23.0		19.0	6.0	23.0		19.0				
Max Q Clear Time (g_c+I1), s	2.3	6.6		9.0	3.1	7.1		6.1				
Green Ext Time (p_c), s	0.0	1.7		0.5	0.0	1.5		0.5				

Intersection Summary

HCM 6th Ctrl Delay	11.4
HCM 6th LOS	B

HCM 6th TWSC  
 3: NE 81st Avenue & NE 63rd Street

10/16/2023

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	282	27	17	253	42	9
Future Vol, veh/h	282	27	17	253	42	9
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	1	1	2	2	4	4
Mvmt Flow	282	27	17	253	42	9

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	310	0	584 297
Stage 1	-	-	-	-	297 -
Stage 2	-	-	-	-	287 -
Critical Hdwy	-	-	4.12	-	6.44 6.24
Critical Hdwy Stg 1	-	-	-	-	5.44 -
Critical Hdwy Stg 2	-	-	-	-	5.44 -
Follow-up Hdwy	-	-	2.218	-	3.536 3.336
Pot Cap-1 Maneuver	-	-	1250	-	471 738
Stage 1	-	-	-	-	749 -
Stage 2	-	-	-	-	757 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1249	-	464 737
Mov Cap-2 Maneuver	-	-	-	-	464 -
Stage 1	-	-	-	-	748 -
Stage 2	-	-	-	-	746 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	13.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	496	-	-	1249	-
HCM Lane V/C Ratio	0.103	-	-	0.014	-
HCM Control Delay (s)	13.1	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-

HCM 6th TWSC  
4: NE 58th Street & NE 81st Avenue

10/16/2023

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	8	76	81	65	57	8
Future Vol, veh/h	8	76	81	65	57	8
Conflicting Peds, #/hr	1	0	0	1	1	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	92	92	92	92	92	92
Heavy Vehicles, %	1	1	3	3	2	2
Mvmt Flow	9	83	88	71	62	9

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	160	0	-	0	227 127
Stage 1	-	-	-	-	125 -
Stage 2	-	-	-	-	102 -
Critical Hdwy	4.11	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.209	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1425	-	-	-	761 923
Stage 1	-	-	-	-	901 -
Stage 2	-	-	-	-	922 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1424	-	-	-	754 920
Mov Cap-2 Maneuver	-	-	-	-	754 -
Stage 1	-	-	-	-	894 -
Stage 2	-	-	-	-	921 -

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1424	-	-	-	771
HCM Lane V/C Ratio	0.006	-	-	-	0.092
HCM Control Delay (s)	7.5	0	-	-	10.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

HCM 6th TWSC  
5: NE 82nd Avenue & NE 58th Street

10/16/2023

Intersection												
Int Delay, s/veh	8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	16	104	81	14	0	132	4	118	0	3	0
Future Vol, veh/h	0	16	104	81	14	0	132	4	118	0	3	0
Conflicting Peds, #/hr	3	0	2	2	0	3	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	1	1	1	33	33	33
Mvmt Flow	0	17	113	88	15	0	143	4	128	0	3	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	18	0	0	132	0	0	269	270	76	334	326	18
Stage 1	-	-	-	-	-	-	76	76	-	194	194	-
Stage 2	-	-	-	-	-	-	193	194	-	140	132	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.11	6.51	6.21	7.43	6.83	6.53
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.43	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.43	5.83	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.509	4.009	3.309	3.797	4.297	3.597
Pot Cap-1 Maneuver	1586	-	-	1441	-	-	686	638	988	565	545	977
Stage 1	-	-	-	-	-	-	936	834	-	741	685	-
Stage 2	-	-	-	-	-	-	811	742	-	794	731	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1581	-	-	1438	-	-	649	595	986	464	508	974
Mov Cap-2 Maneuver	-	-	-	-	-	-	649	595	-	464	508	-
Stage 1	-	-	-	-	-	-	934	832	-	739	640	-
Stage 2	-	-	-	-	-	-	757	694	-	687	730	-





















Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			6.5			12.3			12.1		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	770	1581	-	-	1438	-	-	508
HCM Lane V/C Ratio	0.359	-	-	-	0.061	-	-	0.006
HCM Control Delay (s)	12.3	0	-	-	7.7	0	-	12.1
HCM Lane LOS	B	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	1.6	0	-	-	0.2	-	-	0

# HCM Signalized Intersection Capacity Analysis

## 1: NE Andresen Road & NE 63rd Street





















10/16/2023

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	96	158	177	136	195	71	168	396	55	44	570	98	
Future Volume (vph)	96	158	177	136	195	71	168	396	55	44	570	98	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95		
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.92		1.00	0.96		1.00	0.98		1.00	0.98		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1656	3023		1719	3301		1736	3402		1703	3330		
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1656	3023		1719	3301		1736	3402		1703	3330		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	104	172	192	148	212	77	183	430	60	48	620	107	
RTOR Reduction (vph)	0	159	0	0	59	0	0	13	0	0	19	0	
Lane Group Flow (vph)	104	205	0	148	230	0	183	477	0	48	708	0	
Confl. Peds. (#/hr)			3	3									
Confl. Bikes (#/hr)			1						2				
Heavy Vehicles (%)	9%	9%	9%	5%	5%	5%	4%	4%	4%	6%	6%	6%	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases													
Actuated Green, G (s)	5.8	12.2		8.6	15.0		12.7	28.1		5.1	20.5		
Effective Green, g (s)	5.8	12.2		8.6	15.0		12.7	28.1		5.1	20.5		
Actuated g/C Ratio	0.08	0.17		0.12	0.21		0.18	0.40		0.07	0.29		
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	137	526		211	707		314	1365		124	975		
v/s Ratio Prot	0.06	0.07		c0.09	c0.07		c0.11	0.14		0.03	c0.21		
v/s Ratio Perm													
v/c Ratio	0.76	0.39		0.70	0.33		0.58	0.35		0.39	0.73		
Uniform Delay, d1	31.4	25.6		29.5	23.2		26.2	14.6		31.0	22.2		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	21.1	2.2		10.1	1.2		2.7	0.2		2.0	2.7		
Delay (s)	52.6	27.8		39.5	24.5		29.0	14.7		33.0	24.9		
Level of Service	D	C		D	C		C	B		C	C		
Approach Delay (s)		33.3			29.6			18.6			25.4		
Approach LOS		C			C			B			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay			25.8									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.60										
Actuated Cycle Length (s)			70.0									Sum of lost time (s)	16.0
Intersection Capacity Utilization			64.1%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

# HCM 6th Signalized Intersection Summary

## 1: NE Andresen Road & NE 63rd Street

10/16/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	158	177	136	195	71	168	396	55	44	570	98
Future Volume (veh/h)	96	158	177	136	195	71	168	396	55	44	570	98
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		1.00	1.00		0.99	1.00		1.00
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	1767	1767	1767	1826	1826	1826	1841	1841	1841	1811	1811	1811
Adj Flow Rate, veh/h	104	172	33	148	212	18	183	430	47	48	620	89
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	9	9	9	5	5	5	4	4	4	6	6	6
Cap, veh/h	130	854	160	174	1056	89	222	1030	112	75	728	104
Arrive On Green	0.08	0.30	0.30	0.10	0.33	0.33	0.13	0.32	0.32	0.04	0.24	0.24
Sat Flow, veh/h	1682	2812	528	1739	3238	273	1753	3176	345	1725	3021	433
Grp Volume(v), veh/h	104	101	104	148	113	117	183	236	241	48	353	356
Grp Sat Flow(s),veh/h/ln	1682	1678	1662	1739	1735	1776	1753	1749	1773	1725	1721	1733
Q Serve(g_s), s	4.3	3.1	3.3	5.9	3.3	3.3	7.1	7.4	7.5	1.9	13.7	13.8
Cycle Q Clear(g_c), s	4.3	3.1	3.3	5.9	3.3	3.3	7.1	7.4	7.5	1.9	13.7	13.8
Prop In Lane	1.00		0.32	1.00		0.15	1.00		0.19	1.00		0.25
Lane Grp Cap(c), veh/h	130	510	505	174	566	579	222	567	575	75	415	418
V/C Ratio(X)	0.80	0.20	0.21	0.85	0.20	0.20	0.82	0.42	0.42	0.64	0.85	0.85
Avail Cap(c_a), veh/h	144	510	505	174	566	579	225	567	575	155	455	458
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	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.7	18.1	18.1	31.0	17.0	17.0	29.8	18.5	18.5	32.9	25.4	25.4
Incr Delay (d2), s/veh	24.2	0.9	0.9	29.6	0.7	0.7	21.1	0.5	0.5	8.8	13.3	13.5
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	2.5	1.2	1.3	3.8	1.3	1.4	4.1	2.7	2.8	0.9	6.6	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.9	18.9	19.0	60.6	17.7	17.8	51.0	19.0	19.0	41.8	38.7	38.9
LnGrp LOS	E	B	B	E	B	B	D	B	B	D	D	D
Approach Vol, veh/h		309			378			660			757	
Approach Delay, s/veh		31.4			34.5			27.8			39.0	
Approach LOS		C			C			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.0	25.3	12.9	20.9	9.4	26.8	7.0	26.7				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	7.0	19.5	9.0	18.5	6.0	20.5	6.3	21.2				
Max Q Clear Time (g_c+I1), s	7.9	5.3	9.1	15.8	6.3	5.3	3.9	9.5				
Green Ext Time (p_c), s	0.0	0.8	0.0	1.1	0.0	1.0	0.0	2.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			33.6									
HCM 6th LOS			C									

# HCM Signalized Intersection Capacity Analysis

## 2: NE 72nd Avenue & NE 63rd Street

10/16/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	134	51	50	244	20	120	59	65	17	79	66
Future Volume (vph)	37	134	51	50	244	20	120	59	65	17	79	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.92		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1700	1792	1490	1701	1768		1669	1589		1671	1644	
Flt Permitted	0.58	1.00	1.00	0.64	1.00		0.62	1.00		0.67	1.00	
Satd. Flow (perm)	1045	1792	1490	1139	1768		1096	1589		1179	1644	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	146	55	54	265	22	130	64	71	18	86	72
RTOR Reduction (vph)	0	0	26	0	4	0	0	57	0	0	57	0
Lane Group Flow (vph)	40	146	29	54	283	0	130	78	0	18	101	0
Confl. Peds. (#/hr)	3		1	1		3	2		7	7		2
Confl. Bikes (#/hr)			1						3			
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	8%	8%	8%	7%	7%	7%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	34.5	31.8	31.8	37.3	33.2		12.1	12.1		12.1	12.1	
Effective Green, g (s)	34.5	31.8	31.8	37.3	33.2		12.1	12.1		12.1	12.1	
Actuated g/C Ratio	0.58	0.53	0.53	0.62	0.55		0.20	0.20		0.20	0.20	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	630	949	789	746	978		221	320		237	331	
v/s Ratio Prot	0.00	0.08		c0.00	c0.16			0.05			0.06	
v/s Ratio Perm	0.03		0.02	0.04			c0.12			0.02		
v/c Ratio	0.06	0.15	0.04	0.07	0.29		0.59	0.24		0.08	0.30	
Uniform Delay, d1	5.5	7.2	6.8	4.5	7.1		21.7	20.1		19.4	20.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.3	0.1	0.0	0.2		4.0	0.4		0.1	0.5	
Delay (s)	5.6	7.6	6.8	4.5	7.3		25.7	20.5		19.6	20.9	
Level of Service	A	A	A	A	A		C	C		B	C	
Approach Delay (s)		7.1			6.9			23.0			20.8	
Approach LOS		A			A			C			C	

Intersection Summary			
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.35		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	47.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary  
 2: NE 72nd Avenue & NE 63rd Street

10/16/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	134	51	50	244	20	120	59	65	17	79	66
Future Volume (veh/h)	37	134	51	50	244	20	120	59	65	17	79	66
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		1.00	0.99		0.97	0.99		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	1811	1811	1811	1811	1811	1811	1781	1781	1781	1796	1796	1796
Adj Flow Rate, veh/h	40	146	29	54	265	18	130	64	14	18	86	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	6	6	8	8	8	7	7	7
Cap, veh/h	690	989	819	797	931	63	309	288	63	329	304	53
Arrive On Green	0.04	0.55	0.55	0.05	0.56	0.56	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1725	1811	1499	1725	1676	114	1216	1408	308	1258	1485	259
Grp Volume(v), veh/h	40	146	29	54	0	283	130	0	78	18	0	101
Grp Sat Flow(s),veh/h/ln	1725	1811	1499	1725	0	1790	1216	0	1717	1258	0	1744
Q Serve(g_s), s	0.6	2.4	0.5	0.8	0.0	5.0	6.1	0.0	2.3	0.7	0.0	2.9
Cycle Q Clear(g_c), s	0.6	2.4	0.5	0.8	0.0	5.0	9.0	0.0	2.3	3.0	0.0	2.9
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.18	1.00		0.15
Lane Grp Cap(c), veh/h	690	989	819	797	0	994	309	0	351	329	0	356
V/C Ratio(X)	0.06	0.15	0.04	0.07	0.00	0.28	0.42	0.00	0.22	0.05	0.00	0.28
Avail Cap(c_a), veh/h	792	989	819	884	0	994	466	0	572	492	0	581
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)	0.89	0.89	0.89	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.4	6.7	6.3	5.1	0.0	7.1	24.0	0.0	19.9	21.1	0.0	20.2
Incr Delay (d2), s/veh	0.0	0.3	0.1	0.0	0.0	0.2	0.9	0.0	0.3	0.1	0.0	0.4
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	0.2	0.8	0.1	0.2	0.0	1.5	1.7	0.0	0.9	0.2	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.5	7.0	6.4	5.1	0.0	7.2	24.9	0.0	20.2	21.2	0.0	20.6
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h		215			337			208				119
Approach Delay, s/veh		6.6			6.9			23.1				20.7
Approach LOS		A			A			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	36.8		16.3	6.4	37.3		16.3				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	6.0	22.0		20.0	6.0	22.0		20.0				
Max Q Clear Time (g_c+I1), s	2.8	4.4		11.0	2.6	7.0		5.0				
Green Ext Time (p_c), s	0.0	0.7		0.5	0.0	1.3		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			12.5									
HCM 6th LOS			B									



HCM 6th TWSC  
 3: NE 81st Avenue & NE 63rd Street

10/16/2023

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	176	39	15	229	36	9
Future Vol, veh/h	176	39	15	229	36	9
Conflicting Peds, #/hr	0	2	2	0	1	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	5	5
Mvmt Flow	191	42	16	249	39	10

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	235	0	496 214
Stage 1	-	-	-	-	214 -
Stage 2	-	-	-	-	282 -
Critical Hdwy	-	-	4.18	-	6.45 6.25
Critical Hdwy Stg 1	-	-	-	-	5.45 -
Critical Hdwy Stg 2	-	-	-	-	5.45 -
Follow-up Hdwy	-	-	2.272	-	3.545 3.345
Pot Cap-1 Maneuver	-	-	1298	-	528 818
Stage 1	-	-	-	-	815 -
Stage 2	-	-	-	-	759 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1296	-	520 816
Mov Cap-2 Maneuver	-	-	-	-	520 -
Stage 1	-	-	-	-	813 -
Stage 2	-	-	-	-	749 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	12
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	561	-	-	1296	-
HCM Lane V/C Ratio	0.087	-	-	0.013	-
HCM Control Delay (s)	12	-	-	7.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	0	-

HCM 6th TWSC  
4: NE 58th Street & NE 81st Avenue

10/16/2023

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	6	69	70	27	70	12
Future Vol, veh/h	6	69	70	27	70	12
Conflicting Peds, #/hr	1	0	0	1	1	1
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	11	11	5	5
Mvmt Flow	7	75	76	29	76	13

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	106	0	-	0	182 93
Stage 1	-	-	-	-	92 -
Stage 2	-	-	-	-	90 -
Critical Hdwy	4.12	-	-	-	6.45 6.25
Critical Hdwy Stg 1	-	-	-	-	5.45 -
Critical Hdwy Stg 2	-	-	-	-	5.45 -
Follow-up Hdwy	2.218	-	-	-	3.545 3.345
Pot Cap-1 Maneuver	1485	-	-	-	801 956
Stage 1	-	-	-	-	924 -
Stage 2	-	-	-	-	926 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1484	-	-	-	795 954
Mov Cap-2 Maneuver	-	-	-	-	795 -
Stage 1	-	-	-	-	918 -
Stage 2	-	-	-	-	925 -

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1484	-	-	-	815
HCM Lane V/C Ratio	0.004	-	-	-	0.109
HCM Control Delay (s)	7.4	0	-	-	10
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.4

HCM 6th TWSC  
5: NE 82nd Avenue & NE 58th Street

10/16/2023

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	14	120	69	26	0	75	2	24	0	2	0
Future Vol, veh/h	1	14	120	69	26	0	75	2	24	0	2	0
Conflicting Peds, #/hr	5	0	0	0	0	5	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	3	3	6	6	6	50	50	50
Mvmt Flow	1	15	130	75	28	0	82	2	26	0	2	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	33	0	0	145	0	0	261	265	80	279	330	33
Stage 1	-	-	-	-	-	-	82	82	-	183	183	-
Stage 2	-	-	-	-	-	-	179	183	-	96	147	-
Critical Hdwy	4.12	-	-	4.13	-	-	7.16	6.56	6.26	7.6	7	6.7
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.6	6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.6	6	-
Follow-up Hdwy	2.218	-	-	2.227	-	-	3.554	4.054	3.354	3.95	4.45	3.75
Pot Cap-1 Maneuver	1579	-	-	1431	-	-	684	634	969	587	519	918
Stage 1	-	-	-	-	-	-	916	819	-	719	666	-
Stage 2	-	-	-	-	-	-	814	741	-	805	692	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1571	-	-	1431	-	-	654	597	969	544	488	914
Mov Cap-2 Maneuver	-	-	-	-	-	-	654	597	-	544	488	-
Stage 1	-	-	-	-	-	-	915	818	-	715	627	-
Stage 2	-	-	-	-	-	-	768	698	-	780	691	-

























Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	5.6	11	12.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	707	1571	-	-	1431	-	-	488
HCM Lane V/C Ratio	0.155	0.001	-	-	0.052	-	-	0.004
HCM Control Delay (s)	11	7.3	0	-	7.7	0	-	12.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.5	0	-	-	0.2	-	-	0

# HCM Signalized Intersection Capacity Analysis

## 1: NE Andresen Road & NE 63rd Street






















10/16/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 			 			 	
Traffic Volume (vph)	182	306	307	151	240	91	417	788	100	72	627	185
Future Volume (vph)	182	306	307	151	240	91	417	788	100	72	627	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.96		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3265		1752	3346		1770	3475		1752	3373	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	3265		1752	3346		1770	3475		1752	3373	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	182	306	307	151	240	91	417	788	100	72	627	185
RTOR Reduction (vph)	0	213	0	0	46	0	0	10	0	0	30	0
Lane Group Flow (vph)	182	400	0	151	285	0	417	878	0	72	782	0
Confl. Peds. (#/hr)	1		7	7		1	2					2
Confl. Bikes (#/hr)			2			2			1			1
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	10.5	17.0		9.2	15.7		24.5	40.5		7.3	23.3	
Effective Green, g (s)	10.5	17.0		9.2	15.7		24.5	40.5		7.3	23.3	
Actuated g/C Ratio	0.12	0.19		0.10	0.17		0.27	0.45		0.08	0.26	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	208	616		179	583		481	1563		142	873	
v/s Ratio Prot	c0.10	c0.12		0.09	0.09		c0.24	0.25		0.04	c0.23	
v/s Ratio Perm												
v/c Ratio	0.88	0.65		0.84	0.49		0.87	0.56		0.51	0.90	
Uniform Delay, d1	39.1	33.7		39.7	33.5		31.2	18.2		39.6	32.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.9	5.2		28.7	2.9		15.1	0.5		2.8	11.7	
Delay (s)	70.1	39.0		68.4	36.4		46.3	18.7		42.5	43.9	
Level of Service	E	D		E	D		D	B		D	D	
Approach Delay (s)		46.1			46.4			27.5			43.8	
Approach LOS		D			D			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay			38.6				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			86.8%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM 6th Signalized Intersection Summary

## 1: NE Andresen Road & NE 63rd Street

10/16/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	182	306	307	151	240	91	417	788	100	72	627	185
Future Volume (veh/h)	182	306	307	151	240	91	417	788	100	72	627	185
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	1.00		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	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	182	306	94	151	240	45	417	788	90	72	627	155
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	1	3	3	3	2	2	2	3	3	3
Cap, veh/h	205	632	190	177	651	120	441	1397	159	93	670	165
Arrive On Green	0.11	0.23	0.23	0.10	0.22	0.22	0.25	0.44	0.44	0.05	0.24	0.24
Sat Flow, veh/h	1795	2697	811	1767	2960	545	1781	3209	366	1767	2792	689
Grp Volume(v), veh/h	182	201	199	151	141	144	417	436	442	72	395	387
Grp Sat Flow(s),veh/h/ln	1795	1791	1717	1767	1763	1742	1781	1777	1798	1767	1763	1719
Q Serve(g_s), s	9.0	8.7	9.0	7.6	6.1	6.3	20.7	16.5	16.5	3.6	19.8	19.9
Cycle Q Clear(g_c), s	9.0	8.7	9.0	7.6	6.1	6.3	20.7	16.5	16.5	3.6	19.8	19.9
Prop In Lane	1.00		0.47	1.00		0.31	1.00		0.20	1.00		0.40
Lane Grp Cap(c), veh/h	205	420	403	177	388	383	441	773	783	93	423	413
V/C Ratio(X)	0.89	0.48	0.49	0.85	0.36	0.38	0.94	0.56	0.56	0.78	0.93	0.94
Avail Cap(c_a), veh/h	205	420	403	177	388	383	441	773	783	183	423	413
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	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	29.7	29.8	39.9	29.8	29.8	33.2	19.0	19.0	42.1	33.5	33.5
Incr Delay (d2), s/veh	33.7	3.9	4.3	30.1	2.5	2.7	29.3	0.9	0.9	12.9	28.0	29.0
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	5.7	4.0	4.0	4.7	2.8	2.9	12.0	6.4	6.5	1.9	11.3	11.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.0	33.6	34.1	69.9	32.3	32.5	62.5	20.0	20.0	55.0	61.5	62.5
LnGrp LOS	E	C	C	E	C	C	E	B	B	E	E	E
Approach Vol, veh/h		582			436			1295			854	
Approach Delay, s/veh		46.1			45.4			33.7			61.4	
Approach LOS		D			D			C			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	25.1	26.3	25.6	14.3	23.8	8.7	43.2				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	9.0	21.1	22.3	21.6	10.3	19.8	9.3	34.6				
Max Q Clear Time (g_c+I1), s	9.6	11.0	22.7	21.9	11.0	8.3	5.6	18.5				
Green Ext Time (p_c), s	0.0	1.6	0.0	0.0	0.0	1.1	0.0	4.8				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			45.0									
HCM 6th LOS			D									

# HCM Signalized Intersection Capacity Analysis

## 2: NE 72nd Avenue & NE 63rd Street

10/16/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	332	54	21	310	19	79	92	20	27	95	81
Future Volume (vph)	88	332	54	21	310	19	79	92	20	27	95	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1786	1881	1550	1764	1844		1770	1805		1747	1707	
Flt Permitted	0.47	1.00	1.00	0.56	1.00		0.54	1.00		0.68	1.00	
Satd. Flow (perm)	886	1881	1550	1040	1844		1014	1805		1260	1707	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	88	332	54	21	310	19	79	92	20	27	95	81
RTOR Reduction (vph)	0	0	20	0	3	0	0	16	0	0	63	0
Lane Group Flow (vph)	88	332	34	21	326	0	79	96	0	27	113	0
Confl. Peds. (#/hr)	1		6	6		1			2	2		
Confl. Bikes (#/hr)			1			1						1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	42.6	37.3	37.3	34.5	33.2		9.4	9.4		9.4	9.4	
Effective Green, g (s)	42.6	37.3	37.3	34.5	33.2		9.4	9.4		9.4	9.4	
Actuated g/C Ratio	0.71	0.62	0.62	0.58	0.55		0.16	0.16		0.16	0.16	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	710	1169	963	613	1020		158	282		197	267	
v/s Ratio Prot	c0.01	c0.18		0.00	c0.18			0.05			0.07	
v/s Ratio Perm	0.08		0.02	0.02			c0.08			0.02		
v/c Ratio	0.12	0.28	0.03	0.03	0.32		0.50	0.34		0.14	0.42	
Uniform Delay, d1	3.0	5.2	4.4	5.5	7.3		23.1	22.5		21.8	22.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.6	0.1	0.0	0.2		2.5	0.7		0.3	1.1	
Delay (s)	3.1	5.8	4.5	5.5	7.5		25.6	23.3		22.1	23.9	
Level of Service	A	A	A	A	A		C	C		C	C	
Approach Delay (s)		5.2			7.3			24.2			23.7	
Approach LOS		A			A			C			C	

### Intersection Summary

HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

HCM 6th Signalized Intersection Summary  
 2: NE 72nd Avenue & NE 63rd Street

10/16/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	332	54	21	310	19	79	92	20	27	95	81
Future Volume (veh/h)	88	332	54	21	310	19	79	92	20	27	95	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		1.00	1.00		0.97
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	1870	1870	1870	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	88	332	34	21	310	16	79	92	4	27	95	18
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	1	2	2	2	2	2	2	3	3	3
Cap, veh/h	747	1157	956	702	1011	52	254	287	12	269	244	46
Arrive On Green	0.06	0.61	0.61	0.02	0.57	0.57	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1795	1885	1557	1781	1760	91	1274	1779	77	1286	1508	286
Grp Volume(v), veh/h	88	332	34	21	0	326	79	0	96	27	0	113
Grp Sat Flow(s),veh/h/ln	1795	1885	1557	1781	0	1851	1274	0	1856	1286	0	1794
Q Serve(g_s), s	1.1	5.0	0.5	0.3	0.0	5.5	3.5	0.0	2.7	1.1	0.0	3.4
Cycle Q Clear(g_c), s	1.1	5.0	0.5	0.3	0.0	5.5	6.9	0.0	2.7	3.9	0.0	3.4
Prop In Lane	1.00		1.00	1.00		0.05	1.00		0.04	1.00		0.16
Lane Grp Cap(c), veh/h	747	1157	956	702	0	1063	254	0	300	269	0	290
V/C Ratio(X)	0.12	0.29	0.04	0.03	0.00	0.31	0.31	0.00	0.32	0.10	0.00	0.39
Avail Cap(c_a), veh/h	812	1157	956	836	0	1063	452	0	588	468	0	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)	0.67	0.67	0.67	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	4.3	5.4	4.6	4.9	0.0	6.6	25.6	0.0	22.2	24.0	0.0	22.5
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	0.0	0.2	0.7	0.0	0.6	0.2	0.0	0.9
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	0.3	1.5	0.1	0.1	0.0	1.6	1.1	0.0	1.2	0.3	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.3	5.8	4.6	5.0	0.0	6.8	26.3	0.0	22.8	24.1	0.0	23.4
LnGrp LOS	A	A	A	A	A	A	C	A	C	C	A	C
Approach Vol, veh/h		454			347			175				140
Approach Delay, s/veh		5.5			6.7			24.4				23.5
Approach LOS		A			A			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	40.8		13.7	7.8	38.5		13.7				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	6.0	23.0		19.0	6.0	23.0		19.0				
Max Q Clear Time (g_c+I1), s	2.3	7.0		8.9	3.1	7.5		5.9				
Green Ext Time (p_c), s	0.0	1.8		0.5	0.0	1.6		0.5				

Intersection Summary

HCM 6th Ctrl Delay	11.1
HCM 6th LOS	B

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	312	32	18	282	49	9
Future Vol, veh/h	312	32	18	282	49	9
Conflicting Peds, #/hr	0	1	1	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	1	1	2	2	4	4
Mvmt Flow	312	32	18	282	49	9

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	0	345	0	647 329
Stage 1	-	-	-	-	329 -
Stage 2	-	-	-	-	318 -
Critical Hdwy	-	-	4.12	-	6.44 6.24
Critical Hdwy Stg 1	-	-	-	-	5.44 -
Critical Hdwy Stg 2	-	-	-	-	5.44 -
Follow-up Hdwy	-	-	2.218	-	3.536 3.336
Pot Cap-1 Maneuver	-	-	1214	-	432 708
Stage 1	-	-	-	-	725 -
Stage 2	-	-	-	-	733 -
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1213	-	425 707
Mov Cap-2 Maneuver	-	-	-	-	425 -
Stage 1	-	-	-	-	724 -
Stage 2	-	-	-	-	722 -

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	14.1
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	453	-	-	1213	-
HCM Lane V/C Ratio	0.128	-	-	0.015	-
HCM Control Delay (s)	14.1	-	-	8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.4	-	-	0	-



HCM 6th TWSC  
4: NE 58th Street & NE 81st Avenue

10/16/2023

Intersection						
Int Delay, s/veh	2.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	8	83	91	71	62	8
Future Vol, veh/h	8	83	91	71	62	8
Conflicting Peds, #/hr	1	0	0	1	1	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	92	92	92	92	92	92
Heavy Vehicles, %	1	1	3	3	2	2
Mvmt Flow	9	90	99	77	67	9

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	177	0	-	0	248
Stage 1	-	-	-	-	139
Stage 2	-	-	-	-	109
Critical Hdwy	4.11	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.209	-	-	-	3.518
Pot Cap-1 Maneuver	1405	-	-	-	740
Stage 1	-	-	-	-	888
Stage 2	-	-	-	-	916
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1404	-	-	-	733
Mov Cap-2 Maneuver	-	-	-	-	733
Stage 1	-	-	-	-	881
Stage 2	-	-	-	-	915

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1404	-	-	-	749
HCM Lane V/C Ratio	0.006	-	-	-	0.102
HCM Control Delay (s)	7.6	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3

HCM 6th TWSC  
5: NE 82nd Avenue & NE 58th Street

10/16/2023

Intersection												
Int Delay, s/veh	8.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	18	114	86	17	0	145	4	124	0	3	0
Future Vol, veh/h	0	18	114	86	17	0	145	4	124	0	3	0
Conflicting Peds, #/hr	3	0	2	2	0	3	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	1	1	1	33	33	33
Mvmt Flow	0	20	124	93	18	0	158	4	135	0	3	0

Major/Minor	Major1		Major2		Minor1			Minor2				
Conflicting Flow All	21	0	0	146	0	0	290	291	84	359	353	21
Stage 1	-	-	-	-	-	-	84	84	-	207	207	-
Stage 2	-	-	-	-	-	-	206	207	-	152	146	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.11	6.51	6.21	7.43	6.83	6.53
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.43	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.43	5.83	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.509	4.009	3.309	3.797	4.297	3.597
Pot Cap-1 Maneuver	1582	-	-	1424	-	-	664	621	978	543	525	974
Stage 1	-	-	-	-	-	-	927	827	-	729	676	-
Stage 2	-	-	-	-	-	-	798	732	-	782	721	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1577	-	-	1421	-	-	626	577	976	440	488	971
Mov Cap-2 Maneuver	-	-	-	-	-	-	626	577	-	440	488	-
Stage 1	-	-	-	-	-	-	925	825	-	727	629	-
Stage 2	-	-	-	-	-	-	741	681	-	670	720	-





















Approach	EB	WB	NB	SB
HCM Control Delay, s	0	6.4	13	12.4
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	747	1577	-	-	1421	-	-	488
HCM Lane V/C Ratio	0.397	-	-	-	0.066	-	-	0.007
HCM Control Delay (s)	13	0	-	-	7.7	0	-	12.4
HCM Lane LOS	B	A	-	-	A	A	-	B
HCM 95th %tile Q(veh)	1.9	0	-	-	0.2	-	-	0

# HCM Signalized Intersection Capacity Analysis

## 1: NE Andresen Road & NE 63rd Street






















11/12/2023

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	96	159	177	149	200	85	168	396	60	49	570	98	
Future Volume (vph)	96	159	177	149	200	85	168	396	60	49	570	98	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95		
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.92		1.00	0.96		1.00	0.98		1.00	0.98		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1656	3024		1719	3285		1736	3397		1703	3330		
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1656	3024		1719	3285		1736	3397		1703	3330		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	104	173	192	162	217	92	183	430	65	53	620	107	
RTOR Reduction (vph)	0	159	0	0	73	0	0	14	0	0	19	0	
Lane Group Flow (vph)	104	206	0	162	236	0	183	481	0	53	708	0	
Confl. Peds. (#/hr)			3	3									
Confl. Bikes (#/hr)			1						2				
Heavy Vehicles (%)	9%	9%	9%	5%	5%	5%	4%	4%	4%	6%	6%	6%	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases													
Actuated Green, G (s)	6.2	12.0		8.9	14.7		12.9	27.9		5.2	20.2		
Effective Green, g (s)	6.2	12.0		8.9	14.7		12.9	27.9		5.2	20.2		
Actuated g/C Ratio	0.09	0.17		0.13	0.21		0.18	0.40		0.07	0.29		
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	146	518		218	689		319	1353		126	960		
v/s Ratio Prot	0.06	0.07		c0.09	c0.07		c0.11	0.14		0.03	c0.21		
v/s Ratio Perm													
v/c Ratio	0.71	0.40		0.74	0.34		0.57	0.36		0.42	0.74		
Uniform Delay, d1	31.0	25.8		29.4	23.5		26.0	14.7		31.0	22.5		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	15.1	2.3		12.8	1.4		2.5	0.2		2.3	3.0		
Delay (s)	46.2	28.1		42.3	24.9		28.5	14.9		33.2	25.5		
Level of Service	D	C		D	C		C	B		C	C		
Approach Delay (s/veh)		32.1			30.9			18.6			26.0		
Approach LOS		C			C			B			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay (s/veh)			26.1									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.61										
Actuated Cycle Length (s)			70.0									Sum of lost time (s)	16.0
Intersection Capacity Utilization			64.8%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

# HCM 6th Signalized Intersection Summary

## 1: NE Andresen Road & NE 63rd Street

11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	159	177	149	200	85	168	396	60	49	570	98
Future Volume (veh/h)	96	159	177	149	200	85	168	396	60	49	570	98
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		1.00	1.00		0.99	1.00		1.00
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	1767	1767	1767	1826	1826	1826	1841	1841	1841	1811	1811	1811
Adj Flow Rate, veh/h	104	173	34	162	217	26	183	430	51	53	620	89
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	9	9	9	5	5	5	4	4	4	6	6	6
Cap, veh/h	131	829	159	199	1039	123	210	991	117	79	728	104
Arrive On Green	0.08	0.30	0.30	0.11	0.33	0.33	0.12	0.32	0.32	0.05	0.24	0.24
Sat Flow, veh/h	1682	2800	538	1739	3123	370	1753	3146	371	1725	3021	433
Grp Volume(v), veh/h	104	102	105	162	119	124	183	238	243	53	353	356
Grp Sat Flow(s),veh/h/ln	1682	1678	1660	1739	1735	1758	1753	1749	1768	1725	1721	1733
Q Serve(g_s), s	4.3	3.2	3.3	6.4	3.5	3.5	7.2	7.6	7.6	2.1	13.7	13.8
Cycle Q Clear(g_c), s	4.3	3.2	3.3	6.4	3.5	3.5	7.2	7.6	7.6	2.1	13.7	13.8
Prop In Lane	1.00		0.32	1.00		0.21	1.00		0.21	1.00		0.25
Lane Grp Cap(c), veh/h	131	497	491	199	577	585	210	551	557	79	415	418
V/C Ratio(X)	0.80	0.21	0.21	0.82	0.21	0.21	0.87	0.43	0.44	0.67	0.85	0.85
Avail Cap(c_a), veh/h	173	497	491	199	577	585	210	551	557	160	455	458
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	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.7	18.5	18.5	30.3	16.7	16.8	30.3	19.0	19.0	32.9	25.4	25.4
Incr Delay (d2), s/veh	16.9	0.9	1.0	21.1	0.8	0.8	30.1	0.5	0.5	9.3	13.3	13.5
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	2.2	1.3	1.3	3.7	1.4	1.4	4.6	2.8	2.9	1.0	6.6	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	48.6	19.4	19.5	51.3	17.5	17.5	60.3	19.5	19.6	42.2	38.7	38.9
LnGrp LOS	D	B	B	D	B	B	E	B	B	D	D	D
Approach Vol, veh/h		311			405			664			762	
Approach Delay, s/veh		29.2			31.0			30.8			39.0	
Approach LOS		C			C			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	24.7	12.4	20.9	9.4	27.3	7.2	26.1				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	8.0	19.1	8.4	18.5	7.2	19.9	6.5	20.4				
Max Q Clear Time (g_c+I1), s	8.4	5.3	9.2	15.8	6.3	5.5	4.1	9.6				
Green Ext Time (p_c), s	0.0	0.8	0.0	1.1	0.0	1.1	0.0	2.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh			33.5									
HCM 6th LOS			C									

# HCM Signalized Intersection Capacity Analysis

## 2: NE 72nd Avenue & NE 63rd Street























11/12/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	145	51	54	276	20	120	59	66	17	79	66
Future Volume (vph)	37	145	51	54	276	20	120	59	66	17	79	66
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.92		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1700	1792	1490	1701	1771		1669	1588		1671	1644	
Flt Permitted	0.56	1.00	1.00	0.63	1.00		0.62	1.00		0.67	1.00	
Satd. Flow (perm)	998	1792	1490	1127	1771		1096	1588		1178	1644	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	158	55	59	300	22	130	64	72	18	86	72
RTOR Reduction (vph)	0	0	26	0	3	0	0	57	0	0	57	0
Lane Group Flow (vph)	40	158	29	59	319	0	130	79	0	18	101	0
Confl. Peds. (#/hr)	3		1	1		3	2		7	7		2
Confl. Bikes (#/hr)			1						3			
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	8%	8%	8%	7%	7%	7%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	34.5	31.8	31.8	37.3	33.2		12.1	12.1		12.1	12.1	
Effective Green, g (s)	34.5	31.8	31.8	37.3	33.2		12.1	12.1		12.1	12.1	
Actuated g/C Ratio	0.57	0.53	0.53	0.62	0.55		0.20	0.20		0.20	0.20	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	605	949	789	739	979		221	320		237	331	
v/s Ratio Prot	0.00	0.09		c0.01	c0.18			0.05			0.06	
v/s Ratio Perm	0.04		0.02	0.04			c0.12			0.02		
v/c Ratio	0.07	0.17	0.04	0.08	0.33		0.59	0.25		0.08	0.30	
Uniform Delay, d1	5.6	7.3	6.8	4.5	7.3		21.7	20.1		19.4	20.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.4	0.1	0.0	0.2		4.0	0.4		0.1	0.5	
Delay (s)	5.6	7.6	6.8	4.5	7.5		25.7	20.5		19.6	20.9	
Level of Service	A	A	A	A	A		C	C		B	C	
Approach Delay (s/veh)		7.1			7.0			23.0			20.8	
Approach LOS		A			A			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay (s/veh)			13.3			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			48.6%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM 6th Signalized Intersection Summary

## 2: NE 72nd Avenue & NE 63rd Street

11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	145	51	54	276	20	120	59	66	17	79	66
Future Volume (veh/h)	37	145	51	54	276	20	120	59	66	17	79	66
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		1.00	0.99		0.97	0.99		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	1811	1811	1811	1811	1811	1811	1781	1781	1781	1796	1796	1796
Adj Flow Rate, veh/h	40	158	29	59	300	19	130	64	15	18	86	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	6	6	8	8	8	7	7	7
Cap, veh/h	660	984	815	788	935	59	309	284	66	329	304	53
Arrive On Green	0.04	0.54	0.54	0.05	0.56	0.56	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1725	1811	1499	1725	1685	107	1216	1388	325	1257	1485	259
Grp Volume(v), veh/h	40	158	29	59	0	319	130	0	79	18	0	101
Grp Sat Flow(s),veh/h/ln	1725	1811	1499	1725	0	1792	1216	0	1713	1257	0	1744
Q Serve(g_s), s	0.6	2.6	0.5	0.9	0.0	5.8	6.1	0.0	2.3	0.7	0.0	2.9
Cycle Q Clear(g_c), s	0.6	2.6	0.5	0.9	0.0	5.8	9.0	0.0	2.3	3.0	0.0	2.9
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.19	1.00		0.15
Lane Grp Cap(c), veh/h	660	984	815	788	0	994	309	0	350	329	0	357
V/C Ratio(X)	0.06	0.16	0.04	0.07	0.00	0.32	0.42	0.00	0.23	0.05	0.00	0.28
Avail Cap(c_a), veh/h	763	984	815	870	0	994	466	0	571	491	0	581
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)	0.88	0.88	0.88	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.5	6.9	6.4	5.1	0.0	7.2	24.0	0.0	19.9	21.2	0.0	20.2
Incr Delay (d2), s/veh	0.0	0.3	0.1	0.0	0.0	0.2	0.9	0.0	0.3	0.1	0.0	0.4
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	0.2	0.9	0.1	0.2	0.0	1.7	1.7	0.0	0.9	0.2	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	5.6	7.2	6.4	5.2	0.0	7.4	24.9	0.0	20.2	21.2	0.0	20.6
LnGrp LOS	A	A	A	A		A	C		C	C		C
Approach Vol, veh/h		227			378			209				119
Approach Delay, s/veh		6.8			7.1			23.1				20.7
Approach LOS		A			A			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.1	36.6		16.3	6.4	37.3		16.3				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	6.0	22.0		20.0	6.0	22.0		20.0				
Max Q Clear Time (g_c+I1), s	2.9	4.6		11.0	2.6	7.8		5.0				
Green Ext Time (p_c), s	0.0	0.8		0.5	0.0	1.5		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh				12.3								
HCM 6th LOS				B								

HCM 6th TWSC  
3: NE 81st Avenue & NE 63rd Street

11/12/2023

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↕			↕	
Traffic Vol, veh/h	12	176	39	15	229	7	36	1	9	21	2	36
Future Vol, veh/h	12	176	39	15	229	7	36	1	9	21	2	36
Conflicting Peds, #/hr	0	0	2	2	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	8	8	5	5	5	2	2	2
Mvmt Flow	13	191	42	16	249	8	39	1	10	23	2	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	257	0	0	235	0	0	547	529	214	529	546	254
Stage 1	-	-	-	-	-	-	240	240	-	285	285	-
Stage 2	-	-	-	-	-	-	307	289	-	244	261	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.15	6.55	6.25	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.12	5.52	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.545	4.045	3.345	3.518	4.018	3.318
Pot Cap-1 Maneuver	1274	-	-	1298	-	-	443	451	818	460	445	785
Stage 1	-	-	-	-	-	-	757	701	-	722	676	-
Stage 2	-	-	-	-	-	-	696	668	-	760	692	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1274	-	-	1296	-	-	411	440	816	446	434	784
Mov Cap-2 Maneuver	-	-	-	-	-	-	411	440	-	446	434	-
Stage 1	-	-	-	-	-	-	748	693	-	715	668	-
Stage 2	-	-	-	-	-	-	650	660	-	742	684	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.4			0.5			13.9			11.7		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	456	1274	-	-	1296	-	-	604
HCM Lane V/C Ratio	0.11	0.01	-	-	0.013	-	-	0.106
HCM Control Delay (s/veh)	13.9	7.9	-	-	7.8	-	-	11.7
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q (veh)	0.4	0	-	-	0	-	-	0.4

HCM 6th TWSC  
4: NE 58th Street & NE 81st Avenue

11/12/2023

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	6	69	70	28	72	12
Future Vol, veh/h	6	69	70	28	72	12
Conflicting Peds, #/hr	1	0	0	1	1	1
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	11	11	5	5
Mvmt Flow	7	75	76	30	78	13

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	107	0	-	0	182 93
Stage 1	-	-	-	-	92 -
Stage 2	-	-	-	-	90 -
Critical Hdwy	4.12	-	-	-	6.45 6.25
Critical Hdwy Stg 1	-	-	-	-	5.45 -
Critical Hdwy Stg 2	-	-	-	-	5.45 -
Follow-up Hdwy	2.218	-	-	-	3.545 3.345
Pot Cap-1 Maneuver	1484	-	-	-	801 956
Stage 1	-	-	-	-	924 -
Stage 2	-	-	-	-	926 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1483	-	-	-	795 954
Mov Cap-2 Maneuver	-	-	-	-	795 -
Stage 1	-	-	-	-	918 -
Stage 2	-	-	-	-	925 -

Approach	EB	WB	SB
HCM Control Delay, s/v	0.6	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1483	-	-	-	814
HCM Lane V/C Ratio	0.004	-	-	-	0.112
HCM Control Delay (s/veh)	7.4	0	-	-	10
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q (veh)	0	-	-	-	0.4



HCM 6th TWSC  
5: NE 82nd Avenue & NE 58th Street

11/12/2023

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	14	122	69	26	0	76	2	24	0	2	0
Future Vol, veh/h	1	14	122	69	26	0	76	2	24	0	2	0
Conflicting Peds, #/hr	5	0	0	0	0	5	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	3	3	6	6	6	50	50	50
Mvmt Flow	1	15	133	75	28	0	83	2	26	0	2	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	33	0	0	148	0	0	263	267	82	281	333	33
Stage 1	-	-	-	-	-	-	84	84	-	183	183	-
Stage 2	-	-	-	-	-	-	179	183	-	98	150	-
Critical Hdwy	4.12	-	-	4.13	-	-	7.16	6.56	6.26	7.6	7	6.7
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.6	6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.6	6	-
Follow-up Hdwy	2.218	-	-	2.227	-	-	3.554	4.054	3.354	3.95	4.45	3.75
Pot Cap-1 Maneuver	1579	-	-	1427	-	-	682	632	967	585	516	918
Stage 1	-	-	-	-	-	-	914	817	-	719	666	-
Stage 2	-	-	-	-	-	-	814	741	-	803	690	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1571	-	-	1427	-	-	652	595	967	542	486	914
Mov Cap-2 Maneuver	-	-	-	-	-	-	652	595	-	542	486	-
Stage 1	-	-	-	-	-	-	913	816	-	715	627	-
Stage 2	-	-	-	-	-	-	768	698	-	778	689	-





















Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.1			5.6			11.1			12.4		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	705	1571	-	-	1427	-	-	486
HCM Lane V/C Ratio	0.157	0.001	-	-	0.053	-	-	0.004
HCM Control Delay (s/veh)	11.1	7.3	0	-	7.7	0	-	12.4
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q (veh)	0.6	0	-	-	0.2	-	-	0

# HCM Signalized Intersection Capacity Analysis

## 1: NE Andresen Road & NE 63rd Street






















11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	311	307	160	243	100	417	788	116	88	627	185
Future Volume (vph)	182	311	307	160	243	100	417	788	116	88	627	185
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.96		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3268		1752	3336		1770	3466		1752	3373	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	3268		1752	3336		1770	3466		1752	3373	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	182	311	307	160	243	100	417	788	116	88	627	185
RTOR Reduction (vph)	0	208	0	0	52	0	0	12	0	0	30	0
Lane Group Flow (vph)	182	410	0	160	291	0	417	892	0	88	782	0
Confl. Peds. (#/hr)	1		7	7		1	2					2
Confl. Bikes (#/hr)			2			2			1			1
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	10.5	17.1		9.6	16.2		24.2	39.4		7.9	23.1	
Effective Green, g (s)	10.5	17.1		9.6	16.2		24.2	39.4		7.9	23.1	
Actuated g/C Ratio	0.12	0.19		0.11	0.18		0.27	0.44		0.09	0.26	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	208	620		186	600		475	1517		153	865	
v/s Ratio Prot	c0.10	c0.13		0.09	0.09		c0.24	0.26		0.05	c0.23	
v/s Ratio Perm												
v/c Ratio	0.88	0.66		0.86	0.49		0.88	0.59		0.58	0.90	
Uniform Delay, d1	39.1	33.8		39.5	33.2		31.5	19.2		39.4	32.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.9	5.5		31.0	2.8		16.6	0.6		5.1	12.8	
Delay (s)	70.1	39.2		70.5	36.0		48.1	19.7		44.6	45.1	
Level of Service	E	D		E	D		D	B		D	D	
Approach Delay (s/veh)		46.2			46.9			28.7			45.1	
Approach LOS		D			D			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay (s/veh)			39.5				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			87.4%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM 6th Signalized Intersection Summary

## 1: NE Andresen Road & NE 63rd Street

11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	182	311	307	160	243	100	417	788	116	88	627	185
Future Volume (veh/h)	182	311	307	160	243	100	417	788	116	88	627	185
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	1.00		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	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	182	311	94	160	243	51	417	788	106	88	627	155
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	1	3	3	3	2	2	2	3	3	3
Cap, veh/h	205	623	184	185	638	131	441	1332	179	113	670	165
Arrive On Green	0.11	0.23	0.23	0.10	0.22	0.22	0.25	0.42	0.42	0.06	0.24	0.24
Sat Flow, veh/h	1795	2708	802	1767	2898	596	1781	3142	423	1767	2792	689
Grp Volume(v), veh/h	182	204	201	160	146	148	417	446	448	88	395	387
Grp Sat Flow(s),veh/h/ln	1795	1791	1719	1767	1763	1731	1781	1777	1787	1767	1763	1719
Q Serve(g_s), s	9.0	8.9	9.2	8.0	6.3	6.6	20.7	17.4	17.4	4.4	19.8	19.9
Cycle Q Clear(g_c), s	9.0	8.9	9.2	8.0	6.3	6.6	20.7	17.4	17.4	4.4	19.8	19.9
Prop In Lane	1.00		0.47	1.00		0.34	1.00		0.24	1.00		0.40
Lane Grp Cap(c), veh/h	205	412	395	185	388	381	441	753	758	113	423	413
V/C Ratio(X)	0.89	0.49	0.51	0.87	0.38	0.39	0.94	0.59	0.59	0.78	0.93	0.94
Avail Cap(c_a), veh/h	205	412	395	185	388	381	441	753	758	198	423	413
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	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	30.1	30.2	39.7	29.8	29.9	33.2	19.9	19.9	41.5	33.5	33.5
Incr Delay (d2), s/veh	33.7	4.2	4.6	31.1	2.6	2.8	29.3	1.2	1.2	11.0	28.0	29.0
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	5.7	4.1	4.1	5.0	2.9	2.9	12.0	6.8	6.9	2.2	11.3	11.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	73.0	34.3	34.9	70.8	32.5	32.7	62.5	21.2	21.2	52.5	61.5	62.5
LnGrp LOS	E	C	C	E	C	C	E	C	C	D	E	E
Approach Vol, veh/h		587			454			1311			870	
Approach Delay, s/veh		46.5			46.1			34.3			61.0	
Approach LOS		D			D			C			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.4	24.7	26.3	25.6	14.3	23.8	9.8	42.1				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	9.4	20.7	22.3	21.6	10.3	19.8	10.1	33.8				
Max Q Clear Time (g_c+I1), s	10.0	11.2	22.7	21.9	11.0	8.6	6.4	19.4				
Green Ext Time (p_c), s	0.0	1.5	0.0	0.0	0.0	1.2	0.1	4.7				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh			45.4									
HCM 6th LOS			D									

# HCM Signalized Intersection Capacity Analysis























## 2: NE 72nd Avenue & NE 63rd Street

11/12/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	369	54	23	331	19	79	92	24	27	95	81
Future Volume (vph)	88	369	54	23	331	19	79	92	24	27	95	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1786	1881	1550	1764	1845		1770	1796		1747	1707	
Flt Permitted	0.46	1.00	1.00	0.54	1.00		0.54	1.00		0.68	1.00	
Satd. Flow (perm)	856	1881	1550	1006	1845		1014	1796		1255	1707	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	88	369	54	23	331	19	79	92	24	27	95	81
RTOR Reduction (vph)	0	0	20	0	3	0	0	19	0	0	63	0
Lane Group Flow (vph)	88	369	34	23	347	0	79	97	0	27	113	0
Confl. Peds. (#/hr)	1		6	6		1			2	2		
Confl. Bikes (#/hr)			1			1						1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	42.6	37.3	37.3	34.5	33.2		9.4	9.4		9.4	9.4	
Effective Green, g (s)	42.6	37.3	37.3	34.5	33.2		9.4	9.4		9.4	9.4	
Actuated g/C Ratio	0.71	0.62	0.62	0.57	0.55		0.16	0.16		0.16	0.16	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	691	1169	963	594	1020		158	281		196	267	
v/s Ratio Prot	c0.01	c0.20		0.00	c0.19			0.05			0.07	
v/s Ratio Perm	0.08		0.02	0.02			c0.08			0.02		
v/c Ratio	0.13	0.32	0.03	0.04	0.34		0.50	0.34		0.14	0.42	
Uniform Delay, d1	3.0	5.3	4.4	5.5	7.4		23.1	22.6		21.8	22.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.7	0.1	0.0	0.2		2.5	0.7		0.3	1.1	
Delay (s)	3.1	6.1	4.5	5.5	7.6		25.6	23.3		22.1	23.9	
Level of Service	A	A	A	A	A		C	C		C	C	
Approach Delay (s/veh)		5.4			7.4			24.2			23.7	
Approach LOS		A			A			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay (s/veh)			11.7			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.35									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			51.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary  
 2: NE 72nd Avenue & NE 63rd Street

11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	369	54	23	331	19	79	92	24	27	95	81
Future Volume (veh/h)	88	369	54	23	331	19	79	92	24	27	95	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		1.00	1.00		0.97
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	1870	1870	1870	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	88	369	34	23	331	16	79	92	7	27	95	18
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	1	2	2	2	2	2	2	3	3	3
Cap, veh/h	730	1153	952	674	1014	49	254	278	21	267	244	46
Arrive On Green	0.06	0.61	0.61	0.03	0.57	0.57	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1795	1885	1557	1781	1767	85	1274	1716	131	1282	1508	286
Grp Volume(v), veh/h	88	369	34	23	0	347	79	0	99	27	0	113
Grp Sat Flow(s),veh/h/ln	1795	1885	1557	1781	0	1852	1274	0	1846	1282	0	1794
Q Serve(g_s), s	1.1	5.7	0.5	0.3	0.0	5.9	3.5	0.0	2.8	1.1	0.0	3.4
Cycle Q Clear(g_c), s	1.1	5.7	0.5	0.3	0.0	5.9	6.9	0.0	2.8	4.0	0.0	3.4
Prop In Lane	1.00		1.00	1.00		0.05	1.00		0.07	1.00		0.16
Lane Grp Cap(c), veh/h	730	1153	952	674	0	1063	254	0	299	267	0	290
V/C Ratio(X)	0.12	0.32	0.04	0.03	0.00	0.33	0.31	0.00	0.33	0.10	0.00	0.39
Avail Cap(c_a), veh/h	794	1153	952	805	0	1063	452	0	585	465	0	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)	0.66	0.66	0.66	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	4.4	5.6	4.6	4.9	0.0	6.7	25.6	0.0	22.3	24.0	0.0	22.5
Incr Delay (d2), s/veh	0.0	0.5	0.0	0.0	0.0	0.2	0.7	0.0	0.6	0.2	0.0	0.9
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	0.3	1.7	0.1	0.1	0.0	1.8	1.1	0.0	1.2	0.3	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	4.4	6.1	4.7	5.0	0.0	6.9	26.3	0.0	22.9	24.2	0.0	23.3
LnGrp LOS	A	A	A	A		A	C		C	C		C
Approach Vol, veh/h		491			370			178				140
Approach Delay, s/veh		5.7			6.8			24.4				23.5
Approach LOS		A			A			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.6	40.7		13.7	7.8	38.4		13.7				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	6.0	23.0		19.0	6.0	23.0		19.0				
Max Q Clear Time (g_c+I1), s	2.3	7.7		8.9	3.1	7.9		6.0				
Green Ext Time (p_c), s	0.0	2.0		0.5	0.0	1.7		0.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh				11.0								
HCM 6th LOS				B								

HCM 6th TWSC  
 3: NE 81st Avenue & NE 63rd Street

11/12/2023

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	41	312	32	18	282	23	49	2	9	14	2	23
Future Vol, veh/h	41	312	32	18	282	23	49	2	9	14	2	23
Conflicting Peds, #/hr	3	0	1	1	0	3	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	1	1	1	2	2	2	4	4	4	2	2	2
Mvmt Flow	41	312	32	18	282	23	49	2	9	14	2	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	308	0	0	345	0	0	753	755	329	749	760	297
Stage 1	-	-	-	-	-	-	411	411	-	333	333	-
Stage 2	-	-	-	-	-	-	342	344	-	416	427	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.14	6.54	6.24	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.12	5.52	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.536	4.036	3.336	3.518	4.018	3.318
Pot Cap-1 Maneuver	1258	-	-	1214	-	-	324	335	708	328	336	742
Stage 1	-	-	-	-	-	-	614	591	-	681	644	-
Stage 2	-	-	-	-	-	-	669	633	-	614	585	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1254	-	-	1213	-	-	301	318	707	310	319	740
Mov Cap-2 Maneuver	-	-	-	-	-	-	301	318	-	310	319	-
Stage 1	-	-	-	-	-	-	593	571	-	657	632	-
Stage 2	-	-	-	-	-	-	637	622	-	584	565	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s/v	0.8		0.4		18.3		13.3	
HCM LOS					C		B	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	330	1254	-	-	1213	-	-	473
HCM Lane V/C Ratio	0.182	0.033	-	-	0.015	-	-	0.082
HCM Control Delay (s/veh)	18.3	8	-	-	8	-	-	13.3
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q (veh)	0.7	0.1	-	-	0	-	-	0.3

HCM 6th TWSC  
4: NE 58th Street & NE 81st Avenue

11/12/2023

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	8	83	91	73	64	8
Future Vol, veh/h	8	83	91	73	64	8
Conflicting Peds, #/hr	1	0	0	1	1	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	92	92	92	92	92	92
Heavy Vehicles, %	1	1	3	3	2	2
Mvmt Flow	9	90	99	79	70	9

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	179	0	-	0	249
Stage 1	-	-	-	-	140
Stage 2	-	-	-	-	109
Critical Hdwy	4.11	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.209	-	-	-	3.518
Pot Cap-1 Maneuver	1403	-	-	-	739
Stage 1	-	-	-	-	887
Stage 2	-	-	-	-	916
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1402	-	-	-	732
Mov Cap-2 Maneuver	-	-	-	-	732
Stage 1	-	-	-	-	880
Stage 2	-	-	-	-	915

Approach	EB	WB	SB
HCM Control Delay, s/v	0.7	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1402	-	-	-	748
HCM Lane V/C Ratio	0.006	-	-	-	0.105
HCM Control Delay (s/veh)	7.6	0	-	-	10.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q (veh)	0	-	-	-	0.3

HCM 6th TWSC  
5: NE 82nd Avenue & NE 58th Street

11/12/2023

Intersection												
Int Delay, s/veh	8.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	18	116	86	17	0	147	4	124	0	3	0
Future Vol, veh/h	0	18	116	86	17	0	147	4	124	0	3	0
Conflicting Peds, #/hr	3	0	2	2	0	3	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	1	1	1	33	33	33
Mvmt Flow	0	20	126	93	18	0	160	4	135	0	3	0

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	21	0	0	148	0	0	291	292	85	360	355	21
Stage 1	-	-	-	-	-	-	85	85	-	207	207	-
Stage 2	-	-	-	-	-	-	206	207	-	153	148	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.11	6.51	6.21	7.43	6.83	6.53
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.43	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.43	5.83	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.509	4.009	3.309	3.797	4.297	3.597
Pot Cap-1 Maneuver	1582	-	-	1421	-	-	663	620	977	542	524	974
Stage 1	-	-	-	-	-	-	925	826	-	729	676	-
Stage 2	-	-	-	-	-	-	798	732	-	781	719	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1577	-	-	1418	-	-	625	576	975	440	487	971
Mov Cap-2 Maneuver	-	-	-	-	-	-	625	576	-	440	487	-
Stage 1	-	-	-	-	-	-	923	824	-	727	629	-
Stage 2	-	-	-	-	-	-	741	681	-	669	718	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0	6.4	13	12.4
HCM LOS			B	B

























Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	745	1577	-	-	1418	-	-	487
HCM Lane V/C Ratio	0.401	-	-	-	0.066	-	-	0.007
HCM Control Delay (s/veh)	13	0	-	-	7.7	0	-	12.4
HCM Lane LOS	B	A	-	-	A	A	-	B
HCM 95th %tile Q (veh)	1.9	0	-	-	0.2	-	-	0



# HCM Signalized Intersection Capacity Analysis

## 1: NE Andresen Road & NE 63rd Street






















11/12/2023

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 			 			 		
Traffic Volume (vph)	96	161	177	157	202	93	168	396	62	52	570	98	
Future Volume (vph)	96	161	177	157	202	93	168	396	62	52	570	98	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95		
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.92		1.00	0.95		1.00	0.98		1.00	0.98		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1656	3025		1719	3276		1736	3395		1703	3330		
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1656	3025		1719	3276		1736	3395		1703	3330		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	104	175	192	171	220	101	183	430	67	57	620	107	
RTOR Reduction (vph)	0	160	0	0	80	0	0	15	0	0	19	0	
Lane Group Flow (vph)	104	207	0	171	241	0	183	482	0	57	708	0	
Confl. Peds. (#/hr)			3	3									
Confl. Bikes (#/hr)			1						2				
Heavy Vehicles (%)	9%	9%	9%	5%	5%	5%	4%	4%	4%	6%	6%	6%	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases													
Actuated Green, G (s)	6.2	11.6		9.3	14.7		12.9	27.7		5.4	20.2		
Effective Green, g (s)	6.2	11.6		9.3	14.7		12.9	27.7		5.4	20.2		
Actuated g/C Ratio	0.09	0.17		0.13	0.21		0.18	0.40		0.08	0.29		
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	146	501		228	687		319	1343		131	960		
v/s Ratio Prot	0.06	0.07		c0.10	c0.07		c0.11	0.14		0.03	c0.21		
v/s Ratio Perm													
v/c Ratio	0.71	0.41		0.75	0.35		0.57	0.36		0.44	0.74		
Uniform Delay, d1	31.0	26.2		29.2	23.6		26.0	14.9		30.8	22.5		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	15.1	2.5		13.0	1.4		2.5	0.2		2.3	3.0		
Delay (s)	46.2	28.7		42.2	25.0		28.5	15.1		33.2	25.5		
Level of Service	D	C		D	C		C	B		C	C		
Approach Delay (s/veh)		32.5			31.0			18.7			26.0		
Approach LOS		C			C			B			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay (s/veh)			26.2									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.61										
Actuated Cycle Length (s)			70.0									Sum of lost time (s)	16.0
Intersection Capacity Utilization			65.2%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

# HCM 6th Signalized Intersection Summary

## 1: NE Andresen Road & NE 63rd Street

11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	161	177	157	202	93	168	396	62	52	570	98
Future Volume (veh/h)	96	161	177	157	202	93	168	396	62	52	570	98
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		1.00	1.00		0.99	1.00		1.00
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	1767	1767	1767	1826	1826	1826	1841	1841	1841	1811	1811	1811
Adj Flow Rate, veh/h	104	175	34	171	220	35	183	430	53	57	620	89
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	9	9	9	5	5	5	4	4	4	6	6	6
Cap, veh/h	131	831	158	199	999	157	210	980	120	83	728	104
Arrive On Green	0.08	0.30	0.30	0.11	0.33	0.33	0.12	0.31	0.31	0.05	0.24	0.24
Sat Flow, veh/h	1682	2806	533	1739	3004	471	1753	3131	384	1725	3021	433
Grp Volume(v), veh/h	104	103	106	171	126	129	183	239	244	57	353	356
Grp Sat Flow(s),veh/h/ln	1682	1678	1661	1739	1735	1740	1753	1749	1766	1725	1721	1733
Q Serve(g_s), s	4.3	3.2	3.4	6.8	3.6	3.8	7.2	7.6	7.7	2.3	13.7	13.8
Cycle Q Clear(g_c), s	4.3	3.2	3.4	6.8	3.6	3.8	7.2	7.6	7.7	2.3	13.7	13.8
Prop In Lane	1.00		0.32	1.00		0.27	1.00		0.22	1.00		0.25
Lane Grp Cap(c), veh/h	131	497	492	199	577	579	210	548	553	83	415	418
V/C Ratio(X)	0.80	0.21	0.22	0.86	0.22	0.22	0.87	0.44	0.44	0.69	0.85	0.85
Avail Cap(c_a), veh/h	173	497	492	199	577	579	210	548	553	165	455	458
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	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.7	18.5	18.5	30.5	16.8	16.8	30.3	19.1	19.2	32.8	25.4	25.4
Incr Delay (d2), s/veh	16.9	0.9	1.0	27.8	0.8	0.8	30.1	0.5	0.6	9.8	13.3	13.5
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	2.2	1.3	1.3	4.2	1.5	1.5	4.6	2.9	2.9	1.1	6.6	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	48.6	19.4	19.5	58.3	17.6	17.7	60.3	19.7	19.7	42.6	38.7	38.9
LnGrp LOS	D	B	B	E	B	B	E	B	B	D	D	D
Approach Vol, veh/h		313			426			666			766	
Approach Delay, s/veh		29.2			33.9			30.9			39.1	
Approach LOS		C			C			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	24.7	12.4	20.9	9.4	27.3	7.3	25.9				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	8.0	19.1	8.4	18.5	7.2	19.9	6.7	20.2				
Max Q Clear Time (g_c+I1), s	8.8	5.4	9.2	15.8	6.3	5.8	4.3	9.7				
Green Ext Time (p_c), s	0.0	0.8	0.0	1.1	0.0	1.1	0.0	2.0				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh			34.1									
HCM 6th LOS			C									

# HCM Signalized Intersection Capacity Analysis

## 2: NE 72nd Avenue & NE 63rd Street























11/12/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	152	51	55	294	20	120	59	67	17	79	66
Future Volume (vph)	37	152	51	55	294	20	120	59	67	17	79	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.92		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1700	1792	1490	1702	1772		1669	1587		1671	1644	
Flt Permitted	0.54	1.00	1.00	0.63	1.00		0.62	1.00		0.67	1.00	
Satd. Flow (perm)	964	1792	1490	1123	1772		1096	1587		1177	1644	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	165	55	60	320	22	130	64	73	18	86	72
RTOR Reduction (vph)	0	0	26	0	3	0	0	58	0	0	57	0
Lane Group Flow (vph)	40	165	29	60	339	0	130	79	0	18	101	0
Confl. Peds. (#/hr)	3		1	1		3	2		7	7		2
Confl. Bikes (#/hr)			1						3			
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	8%	8%	8%	7%	7%	7%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	34.6	32.0	32.0	37.2	33.3		12.1	12.1		12.1	12.1	
Effective Green, g (s)	34.6	32.0	32.0	37.2	33.3		12.1	12.1		12.1	12.1	
Actuated g/C Ratio	0.58	0.53	0.53	0.62	0.55		0.20	0.20		0.20	0.20	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	587	955	794	733	983		221	320		237	331	
v/s Ratio Prot	0.00	0.09		c0.01	c0.19			0.05			0.06	
v/s Ratio Perm	0.04		0.02	0.05			c0.12			0.02		
v/c Ratio	0.07	0.17	0.04	0.08	0.34		0.59	0.25		0.08	0.30	
Uniform Delay, d1	5.5	7.2	6.7	4.5	7.3		21.7	20.1		19.4	20.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.4	0.1	0.0	0.2		4.0	0.4		0.1	0.5	
Delay (s)	5.6	7.6	6.8	4.6	7.6		25.7	20.5		19.6	20.9	
Level of Service	A	A	A	A	A		C	C		B	C	
Approach Delay (s/veh)		7.1			7.1			23.0			20.8	
Approach LOS		A			A			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay (s/veh)			13.1			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			49.6%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

# HCM 6th Signalized Intersection Summary

## 2: NE 72nd Avenue & NE 63rd Street

11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	37	152	51	55	294	20	120	59	67	17	79	66
Future Volume (veh/h)	37	152	51	55	294	20	120	59	67	17	79	66
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		1.00	0.99		0.97	0.99		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	1811	1811	1811	1811	1811	1811	1781	1781	1781	1796	1796	1796
Adj Flow Rate, veh/h	40	165	29	60	320	19	130	64	16	18	86	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	6	6	8	8	8	7	7	7
Cap, veh/h	645	984	814	783	940	56	309	279	70	327	303	53
Arrive On Green	0.04	0.54	0.54	0.05	0.56	0.56	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1725	1811	1499	1725	1692	100	1216	1368	342	1256	1485	259
Grp Volume(v), veh/h	40	165	29	60	0	339	130	0	80	18	0	101
Grp Sat Flow(s),veh/h/ln	1725	1811	1499	1725	0	1793	1216	0	1709	1256	0	1744
Q Serve(g_s), s	0.6	2.7	0.5	0.9	0.0	6.2	6.1	0.0	2.3	0.7	0.0	2.9
Cycle Q Clear(g_c), s	0.6	2.7	0.5	0.9	0.0	6.2	9.0	0.0	2.3	3.1	0.0	2.9
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.20	1.00		0.15
Lane Grp Cap(c), veh/h	645	984	814	783	0	996	309	0	349	327	0	356
V/C Ratio(X)	0.06	0.17	0.04	0.08	0.00	0.34	0.42	0.00	0.23	0.06	0.00	0.28
Avail Cap(c_a), veh/h	748	984	814	864	0	996	446	0	541	469	0	552
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)	0.87	0.87	0.87	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.6	6.9	6.4	5.1	0.0	7.3	24.0	0.0	19.9	21.2	0.0	20.2
Incr Delay (d2), s/veh	0.0	0.3	0.1	0.0	0.0	0.2	0.9	0.0	0.3	0.1	0.0	0.4
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	0.2	0.9	0.1	0.2	0.0	1.9	1.7	0.0	0.9	0.2	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	5.6	7.2	6.4	5.2	0.0	7.5	24.9	0.0	20.3	21.3	0.0	20.6
LnGrp LOS	A	A	A	A		A	C		C	C		C
Approach Vol, veh/h		234			399			210				119
Approach Delay, s/veh		6.8			7.2			23.1				20.7
Approach LOS		A			A			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.2	36.6		16.2	6.4	37.3		16.2				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	6.0	23.0		19.0	6.0	23.0		19.0				
Max Q Clear Time (g_c+I1), s	2.9	4.7		11.0	2.6	8.2		5.1				
Green Ext Time (p_c), s	0.0	0.8		0.5	0.0	1.7		0.4				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh				12.2								
HCM 6th LOS				B								

HCM 6th TWSC  
 3: NE 81st Avenue & NE 63rd Street

11/12/2023

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↕			↕	
Traffic Vol, veh/h	20	176	39	15	229	11	36	1	9	32	4	55
Future Vol, veh/h	20	176	39	15	229	11	36	1	9	32	4	55
Conflicting Peds, #/hr	0	0	2	2	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	8	8	5	5	5	2	2	2
Mvmt Flow	22	191	42	16	249	12	39	1	10	35	4	60

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	261	0	0	235	0	0	578	551	214	549	566	256
Stage 1	-	-	-	-	-	-	258	258	-	287	287	-
Stage 2	-	-	-	-	-	-	320	293	-	262	279	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.15	6.55	6.25	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.12	5.52	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.545	4.045	3.345	3.518	4.018	3.318
Pot Cap-1 Maneuver	1269	-	-	1298	-	-	423	438	818	446	434	783
Stage 1	-	-	-	-	-	-	740	689	-	720	674	-
Stage 2	-	-	-	-	-	-	685	665	-	743	680	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1269	-	-	1296	-	-	378	424	816	430	421	782
Mov Cap-2 Maneuver	-	-	-	-	-	-	378	424	-	430	421	-
Stage 1	-	-	-	-	-	-	726	676	-	708	666	-
Stage 2	-	-	-	-	-	-	620	657	-	720	667	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.7			0.5			14.6			12.3		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	423	1269	-	-	1296	-	-	590
HCM Lane V/C Ratio	0.118	0.017	-	-	0.013	-	-	0.168
HCM Control Delay (s/veh)	14.6	7.9	-	-	7.8	-	-	12.3
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q (veh)	0.4	0.1	-	-	0	-	-	0.6

HCM 6th TWSC  
4: NE 58th Street & NE 81st Avenue

11/12/2023

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	6	69	70	28	74	12
Future Vol, veh/h	6	69	70	28	74	12
Conflicting Peds, #/hr	1	0	0	1	1	1
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	11	11	5	5
Mvmt Flow	7	75	76	30	80	13

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	107	0	-	0	182 93
Stage 1	-	-	-	-	92 -
Stage 2	-	-	-	-	90 -
Critical Hdwy	4.12	-	-	-	6.45 6.25
Critical Hdwy Stg 1	-	-	-	-	5.45 -
Critical Hdwy Stg 2	-	-	-	-	5.45 -
Follow-up Hdwy	2.218	-	-	-	3.545 3.345
Pot Cap-1 Maneuver	1484	-	-	-	801 956
Stage 1	-	-	-	-	924 -
Stage 2	-	-	-	-	926 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1483	-	-	-	795 954
Mov Cap-2 Maneuver	-	-	-	-	795 -
Stage 1	-	-	-	-	918 -
Stage 2	-	-	-	-	925 -

Approach	EB	WB	SB
HCM Control Delay, s/v	0.6	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1483	-	-	-	814
HCM Lane V/C Ratio	0.004	-	-	-	0.115
HCM Control Delay (s/veh)	7.4	0	-	-	10
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q (veh)	0	-	-	-	0.4

HCM 6th TWSC  
5: NE 82nd Avenue & NE 58th Street

11/12/2023

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	14	124	69	26	0	76	2	24	0	2	0
Future Vol, veh/h	1	14	124	69	26	0	76	2	24	0	2	0
Conflicting Peds, #/hr	5	0	0	0	0	5	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	3	3	6	6	6	50	50	50
Mvmt Flow	1	15	135	75	28	0	83	2	26	0	2	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	33	0	0	150	0	0	264	268	83	282	335	33
Stage 1	-	-	-	-	-	-	85	85	-	183	183	-
Stage 2	-	-	-	-	-	-	179	183	-	99	152	-
Critical Hdwy	4.12	-	-	4.13	-	-	7.16	6.56	6.26	7.6	7	6.7
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.6	6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.6	6	-
Follow-up Hdwy	2.218	-	-	2.227	-	-	3.554	4.054	3.354	3.95	4.45	3.75
Pot Cap-1 Maneuver	1579	-	-	1425	-	-	681	631	965	584	515	918
Stage 1	-	-	-	-	-	-	913	817	-	719	666	-
Stage 2	-	-	-	-	-	-	814	741	-	802	689	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1571	-	-	1425	-	-	651	594	965	541	485	914
Mov Cap-2 Maneuver	-	-	-	-	-	-	651	594	-	541	485	-
Stage 1	-	-	-	-	-	-	912	816	-	715	627	-
Stage 2	-	-	-	-	-	-	768	698	-	777	688	-





















Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.1			5.6			11.1			12.5		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	704	1571	-	-	1425	-	-	485
HCM Lane V/C Ratio	0.157	0.001	-	-	0.053	-	-	0.004
HCM Control Delay (s/veh)	11.1	7.3	0	-	7.7	0	-	12.5
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q (veh)	0.6	0	-	-	0.2	-	-	0

# HCM Signalized Intersection Capacity Analysis

## 1: NE Andresen Road & NE 63rd Street

11/12/2023






















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	315	307	166	245	106	417	788	125	98	627	185
Future Volume (vph)	182	315	307	166	245	106	417	788	125	98	627	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.95		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3269		1752	3330		1770	3461		1752	3373	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	3269		1752	3330		1770	3461		1752	3373	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	182	315	307	166	245	106	417	788	125	98	627	185
RTOR Reduction (vph)	0	204	0	0	56	0	0	13	0	0	30	0
Lane Group Flow (vph)	182	418	0	166	295	0	417	900	0	98	782	0
Confl. Peds. (#/hr)	1		7	7		1	2					2
Confl. Bikes (#/hr)			2			2			1			1
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	10.5	17.1		9.8	16.4		24.0	38.8		8.3	23.1	
Effective Green, g (s)	10.5	17.1		9.8	16.4		24.0	38.8		8.3	23.1	
Actuated g/C Ratio	0.12	0.19		0.11	0.18		0.27	0.43		0.09	0.26	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	208	621		190	606		472	1492		161	865	
v/s Ratio Prot	c0.10	c0.13		0.09	0.09		c0.24	0.26		0.06	c0.23	
v/s Ratio Perm												
v/c Ratio	0.88	0.67		0.87	0.49		0.88	0.60		0.61	0.90	
Uniform Delay, d1	39.1	33.9		39.5	33.0		31.7	19.7		39.3	32.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.9	5.7		32.9	2.8		17.5	0.7		6.4	12.8	
Delay (s)	70.1	39.6		72.4	35.8		49.2	20.4		45.7	45.1	
Level of Service	E	D		E	D		D	C		D	D	
Approach Delay (s/veh)		46.5			47.5			29.4			45.2	
Approach LOS		D			D			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay (s/veh)			39.9				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			87.9%				ICU Level of Service			E		
Analysis Period (min)			15									
c Critical Lane Group												



# HCM 6th Signalized Intersection Summary

## 1: NE Andresen Road & NE 63rd Street

11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	182	315	307	166	245	106	417	788	125	98	627	185
Future Volume (veh/h)	182	315	307	166	245	106	417	788	125	98	627	185
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	1.00		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	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	182	315	94	166	245	57	417	788	115	98	627	155
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	1	3	3	3	2	2	2	3	3	3
Cap, veh/h	205	619	181	188	624	142	441	1295	189	125	670	165
Arrive On Green	0.11	0.23	0.23	0.11	0.22	0.22	0.25	0.42	0.42	0.07	0.24	0.24
Sat Flow, veh/h	1795	2716	795	1767	2838	646	1781	3105	453	1767	2792	689
Grp Volume(v), veh/h	182	206	203	166	150	152	417	451	452	98	395	387
Grp Sat Flow(s),veh/h/ln	1795	1791	1720	1767	1763	1721	1781	1777	1781	1767	1763	1719
Q Serve(g_s), s	9.0	9.0	9.3	8.3	6.5	6.8	20.7	17.8	17.8	4.9	19.8	19.9
Cycle Q Clear(g_c), s	9.0	9.0	9.3	8.3	6.5	6.8	20.7	17.8	17.8	4.9	19.8	19.9
Prop In Lane	1.00		0.46	1.00		0.38	1.00		0.25	1.00		0.40
Lane Grp Cap(c), veh/h	205	408	392	188	388	379	441	741	743	125	423	413
V/C Ratio(X)	0.89	0.50	0.52	0.88	0.39	0.40	0.94	0.61	0.61	0.78	0.93	0.94
Avail Cap(c_a), veh/h	205	408	392	188	388	379	441	741	743	210	423	413
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	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.3	30.3	30.4	39.6	29.9	30.0	33.2	20.5	20.5	41.1	33.5	33.5
Incr Delay (d2), s/veh	33.7	4.4	4.9	33.0	2.7	2.9	29.3	1.4	1.4	10.2	28.0	29.0
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	5.7	4.2	4.2	5.2	3.0	3.0	12.0	7.1	7.1	2.4	11.3	11.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	73.0	34.7	35.3	72.6	32.6	33.0	62.5	21.9	21.9	51.3	61.5	62.5
LnGrp LOS	E	C	D	E	C	C	E	C	C	D	E	E
Approach Vol, veh/h		591			468			1320			880	
Approach Delay, s/veh		46.7			46.9			34.8			60.8	
Approach LOS		D			D			C			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.6	24.5	26.3	25.6	14.3	23.8	10.4	41.5				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	9.6	20.5	22.3	21.6	10.3	19.8	10.7	33.2				
Max Q Clear Time (g_c+I1), s	10.3	11.3	22.7	21.9	11.0	8.8	6.9	19.8				
Green Ext Time (p_c), s	0.0	1.5	0.0	0.0	0.0	1.2	0.1	4.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh			45.7									
HCM 6th LOS			D									

# HCM Signalized Intersection Capacity Analysis























## 2: NE 72nd Avenue & NE 63rd Street

11/12/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	392	54	25	345	19	79	92	26	27	95	81
Future Volume (vph)	88	392	54	25	345	19	79	92	26	27	95	81
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1550	1764	1846		1770	1792		1747	1707	
Flt Permitted	0.44	1.00	1.00	0.53	1.00		0.54	1.00		0.68	1.00	
Satd. Flow (perm)	836	1881	1550	985	1846		1014	1792		1253	1707	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	88	392	54	25	345	19	79	92	26	27	95	81
RTOR Reduction (vph)	0	0	20	0	2	0	0	21	0	0	63	0
Lane Group Flow (vph)	88	392	34	25	362	0	79	97	0	27	113	0
Confl. Peds. (#/hr)	1		6	6		1			2	2		
Confl. Bikes (#/hr)			1			1						1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	42.6	37.3	37.3	34.5	33.2		9.4	9.4		9.4	9.4	
Effective Green, g (s)	42.6	37.3	37.3	34.5	33.2		9.4	9.4		9.4	9.4	
Actuated g/C Ratio	0.71	0.62	0.62	0.57	0.55		0.16	0.16		0.16	0.16	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	679	1169	963	583	1021		158	280		196	267	
v/s Ratio Prot	c0.01	c0.21		0.00	0.20			0.05			0.07	
v/s Ratio Perm	0.08		0.02	0.02			c0.08			0.02		
v/c Ratio	0.13	0.34	0.03	0.04	0.35		0.50	0.35		0.14	0.42	
Uniform Delay, d1	3.1	5.4	4.4	5.5	7.4		23.1	22.6		21.8	22.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.8	0.1	0.0	0.2		2.5	0.7		0.3	1.1	
Delay (s)	3.2	6.2	4.5	5.5	7.7		25.6	23.3		22.1	23.9	
Level of Service	A	A	A	A	A		C	C		C	C	
Approach Delay (s/veh)		5.5			7.5			24.2			23.7	
Approach LOS		A			A			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay (s/veh)			11.7			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			52.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary  
 2: NE 72nd Avenue & NE 63rd Street

11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	392	54	25	345	19	79	92	26	27	95	81
Future Volume (veh/h)	88	392	54	25	345	19	79	92	26	27	95	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		1.00	1.00		0.97
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	1870	1870	1870	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	88	392	34	25	345	16	79	92	9	27	95	18
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	1	2	2	2	2	2	2	3	3	3
Cap, veh/h	719	1149	949	657	1017	47	254	271	27	265	244	46
Arrive On Green	0.06	0.61	0.61	0.03	0.57	0.57	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1795	1885	1557	1781	1771	82	1274	1676	164	1280	1508	286
Grp Volume(v), veh/h	88	392	34	25	0	361	79	0	101	27	0	113
Grp Sat Flow(s),veh/h/ln	1795	1885	1557	1781	0	1853	1274	0	1840	1280	0	1794
Q Serve(g_s), s	1.1	6.1	0.5	0.3	0.0	6.2	3.5	0.0	2.9	1.1	0.0	3.4
Cycle Q Clear(g_c), s	1.1	6.1	0.5	0.3	0.0	6.2	6.9	0.0	2.9	4.1	0.0	3.4
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.09	1.00		0.16
Lane Grp Cap(c), veh/h	719	1149	949	657	0	1064	254	0	298	265	0	290
V/C Ratio(X)	0.12	0.34	0.04	0.04	0.00	0.34	0.31	0.00	0.34	0.10	0.00	0.39
Avail Cap(c_a), veh/h	783	1149	949	770	0	1064	452	0	583	463	0	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)	0.64	0.64	0.64	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	4.4	5.8	4.7	4.9	0.0	6.8	25.6	0.0	22.3	24.1	0.0	22.5
Incr Delay (d2), s/veh	0.0	0.5	0.0	0.0	0.0	0.2	0.7	0.0	0.7	0.2	0.0	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	0.3	1.9	0.1	0.1	0.0	1.8	1.1	0.0	1.2	0.3	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	4.5	6.3	4.7	5.0	0.0	6.9	26.3	0.0	23.0	24.3	0.0	23.3
LnGrp LOS	A	A	A	A		A	C		C	C		C
Approach Vol, veh/h		514			386			180				140
Approach Delay, s/veh		5.9			6.8			24.4				23.5
Approach LOS		A			A			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.7	40.6		13.7	7.8	38.4		13.7				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	5.5	23.5		19.0	6.0	23.0		19.0				
Max Q Clear Time (g_c+I1), s	2.3	8.1		8.9	3.1	8.2		6.1				
Green Ext Time (p_c), s	0.0	2.1		0.5	0.0	1.8		0.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh				10.9								
HCM 6th LOS				B								

HCM 6th TWSC  
3: NE 81st Avenue & NE 63rd Street

11/12/2023

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↕			↕	
Traffic Vol, veh/h	66	312	32	18	282	37	49	2	9	23	3	39
Future Vol, veh/h	66	312	32	18	282	37	49	2	9	23	3	39
Conflicting Peds, #/hr	3	0	1	1	0	3	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	1	1	1	2	2	2	4	4	4	2	2	2
Mvmt Flow	66	312	32	18	282	37	49	2	9	23	3	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	322	0	0	345	0	0	819	819	329	806	817	304
Stage 1	-	-	-	-	-	-	461	461	-	340	340	-
Stage 2	-	-	-	-	-	-	358	358	-	466	477	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.14	6.54	6.24	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.12	5.52	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.536	4.036	3.336	3.518	4.018	3.318
Pot Cap-1 Maneuver	1244	-	-	1214	-	-	292	308	708	300	311	736
Stage 1	-	-	-	-	-	-	577	562	-	675	639	-
Stage 2	-	-	-	-	-	-	656	624	-	577	556	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1240	-	-	1213	-	-	260	286	707	279	289	734
Mov Cap-2 Maneuver	-	-	-	-	-	-	260	286	-	279	289	-
Stage 1	-	-	-	-	-	-	546	532	-	637	627	-
Stage 2	-	-	-	-	-	-	609	613	-	537	526	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	1.3			0.4			20.8			14.5		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	288	1240	-	-	1213	-	-	445
HCM Lane V/C Ratio	0.208	0.053	-	-	0.015	-	-	0.146
HCM Control Delay (s/veh)	20.8	8.1	-	-	8	-	-	14.5
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q (veh)	0.8	0.2	-	-	0	-	-	0.5

HCM 6th TWSC  
4: NE 58th Street & NE 81st Avenue

11/12/2023

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	8	83	91	75	65	8
Future Vol, veh/h	8	83	91	75	65	8
Conflicting Peds, #/hr	1	0	0	1	1	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	92	92	92	92	92	92
Heavy Vehicles, %	1	1	3	3	2	2
Mvmt Flow	9	90	99	82	71	9

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	182	0	-	0	250 143
Stage 1	-	-	-	-	141 -
Stage 2	-	-	-	-	109 -
Critical Hdwy	4.11	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	2.209	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	1399	-	-	-	739 905
Stage 1	-	-	-	-	886 -
Stage 2	-	-	-	-	916 -
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1398	-	-	-	732 902
Mov Cap-2 Maneuver	-	-	-	-	732 -
Stage 1	-	-	-	-	879 -
Stage 2	-	-	-	-	915 -

Approach	EB	WB	SB
HCM Control Delay, s/v	0.7	0	10.4
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1398	-	-	-	747
HCM Lane V/C Ratio	0.006	-	-	-	0.106
HCM Control Delay (s/veh)	7.6	0	-	-	10.4
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q (veh)	0	-	-	-	0.4

HCM 6th TWSC  
5: NE 82nd Avenue & NE 58th Street

11/12/2023

Intersection												
Int Delay, s/veh	8.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	18	117	86	17	0	149	4	124	0	3	0
Future Vol, veh/h	0	18	117	86	17	0	149	4	124	0	3	0
Conflicting Peds, #/hr	3	0	2	2	0	3	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	1	1	1	33	33	33
Mvmt Flow	0	20	127	93	18	0	162	4	135	0	3	0

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	21	0	0	149	0	0	292	293	86	360	356	21
Stage 1	-	-	-	-	-	-	86	86	-	207	207	-
Stage 2	-	-	-	-	-	-	206	207	-	153	149	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.11	6.51	6.21	7.43	6.83	6.53
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.43	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.43	5.83	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.509	4.009	3.309	3.797	4.297	3.597
Pot Cap-1 Maneuver	1582	-	-	1420	-	-	662	620	976	542	523	974
Stage 1	-	-	-	-	-	-	924	826	-	729	676	-
Stage 2	-	-	-	-	-	-	798	732	-	781	718	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1577	-	-	1417	-	-	624	576	974	440	486	971
Mov Cap-2 Maneuver	-	-	-	-	-	-	624	576	-	440	486	-
Stage 1	-	-	-	-	-	-	922	824	-	727	629	-
Stage 2	-	-	-	-	-	-	741	681	-	669	717	-






















Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0	6.4	13.1	12.5
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	743	1577	-	-	1417	-	-	486
HCM Lane V/C Ratio	0.405	-	-	-	0.066	-	-	0.007
HCM Control Delay (s/veh)	13.1	0	-	-	7.7	0	-	12.5
HCM Lane LOS	B	A	-	-	A	A	-	B
HCM 95th %tile Q (veh)	2	0	-	-	0.2	-	-	0

# HCM Signalized Intersection Capacity Analysis

## 1: NE Andresen Road & NE 63rd Street

11/12/2023

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	104	171	190	159	214	90	180	427	65	52	614	106	
Future Volume (vph)	104	171	190	159	214	90	180	427	65	52	614	106	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95		
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.92		1.00	0.96		1.00	0.98		1.00	0.98		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1656	3023		1719	3285		1736	3396		1703	3331		
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1656	3023		1719	3285		1736	3396		1703	3331		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	113	186	207	173	233	98	196	464	71	57	667	115	
RTOR Reduction (vph)	0	174	0	0	73	0	0	15	0	0	19	0	
Lane Group Flow (vph)	113	219	0	173	258	0	196	520	0	57	763	0	
Confl. Peds. (#/hr)			3	3									
Confl. Bikes (#/hr)			1						2				
Heavy Vehicles (%)	9%	9%	9%	5%	5%	5%	4%	4%	4%	6%	6%	6%	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases													
Actuated Green, G (s)	6.3	11.1		9.1	13.9		13.3	28.5		5.3	20.5		
Effective Green, g (s)	6.3	11.1		9.1	13.9		13.3	28.5		5.3	20.5		
Actuated g/C Ratio	0.09	0.16		0.13	0.20		0.19	0.41		0.08	0.29		
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	149	479		223	652		329	1382		128	975		
v/s Ratio Prot	0.07	0.07		c0.10	c0.08		c0.11	0.15		0.03	c0.23		
v/s Ratio Perm													
v/c Ratio	0.76	0.46		0.78	0.40		0.60	0.38		0.45	0.78		
Uniform Delay, d1	31.1	26.7		29.5	24.4		25.9	14.5		30.9	22.7		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	19.6	3.1		15.5	1.8		2.9	0.2		2.5	4.2		
Delay (s)	50.7	29.8		44.9	26.2		28.8	14.7		33.4	26.9		
Level of Service	D	C		D	C		C	B		C	C		
Approach Delay (s/veh)		34.5			32.6			18.5			27.3		
Approach LOS		C			C			B			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay (s/veh)			27.3									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.66										
Actuated Cycle Length (s)			70.0									Sum of lost time (s)	16.0
Intersection Capacity Utilization			67.5%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

# HCM 6th Signalized Intersection Summary

## 1: NE Andresen Road & NE 63rd Street

11/12/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	171	190	159	214	90	180	427	65	52	614	106
Future Volume (veh/h)	104	171	190	159	214	90	180	427	65	52	614	106
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		1.00	1.00		0.99	1.00		1.00
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	1767	1767	1767	1826	1826	1826	1841	1841	1841	1811	1811	1811
Adj Flow Rate, veh/h	113	186	34	173	233	34	196	464	57	57	667	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	9	9	9	5	5	5	4	4	4	6	6	6
Cap, veh/h	142	788	141	199	937	135	223	1038	127	83	760	110
Arrive On Green	0.08	0.28	0.28	0.11	0.31	0.31	0.13	0.33	0.33	0.05	0.25	0.25
Sat Flow, veh/h	1682	2836	508	1739	3042	438	1753	3132	383	1725	3015	438
Grp Volume(v), veh/h	113	109	111	173	132	135	196	258	263	57	380	384
Grp Sat Flow(s),veh/h/ln	1682	1678	1665	1739	1735	1746	1753	1749	1766	1725	1721	1732
Q Serve(g_s), s	4.6	3.5	3.6	6.8	4.0	4.1	7.7	8.1	8.2	2.3	14.9	14.9
Cycle Q Clear(g_c), s	4.6	3.5	3.6	6.8	4.0	4.1	7.7	8.1	8.2	2.3	14.9	14.9
Prop In Lane	1.00		0.30	1.00		0.25	1.00		0.22	1.00		0.25
Lane Grp Cap(c), veh/h	142	467	463	199	534	538	223	579	585	83	434	437
V/C Ratio(X)	0.80	0.23	0.24	0.87	0.25	0.25	0.88	0.45	0.45	0.69	0.88	0.88
Avail Cap(c_a), veh/h	183	467	463	199	534	538	223	579	585	165	455	458
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	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.5	19.5	19.6	30.5	18.1	18.2	30.0	18.4	18.4	32.8	25.1	25.2
Incr Delay (d2), s/veh	16.9	1.2	1.2	29.4	1.0	1.0	30.5	0.5	0.5	9.8	16.9	17.0
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	2.4	1.4	1.4	4.3	1.6	1.7	4.9	3.0	3.1	1.1	7.5	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	48.4	20.7	20.8	59.9	19.1	19.2	60.6	18.9	18.9	42.6	42.0	42.2
LnGrp LOS	D	C	C	E	B	B	E	B	B	D	D	D
Approach Vol, veh/h		333			440			717			821	
Approach Delay, s/veh		30.1			35.2			30.3			42.1	
Approach LOS		C			D			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	23.5	12.9	21.6	9.9	25.6	7.3	27.2				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	8.0	18.6	8.9	18.5	7.6	19.0	6.7	20.7				
Max Q Clear Time (g_c+I1), s	8.8	5.6	9.7	16.9	6.6	6.1	4.3	10.2				
Green Ext Time (p_c), s	0.0	0.9	0.0	0.7	0.0	1.1	0.0	2.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh			35.4									
HCM 6th LOS			D									



# HCM Signalized Intersection Capacity Analysis

## 2: NE 72nd Avenue & NE 63rd Street

11/12/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	39	154	55	58	294	21	129	63	71	18	86	71
Future Volume (vph)	39	154	55	58	294	21	129	63	71	18	86	71
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.92		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1700	1792	1490	1702	1771		1669	1588		1671	1645	
Flt Permitted	0.54	1.00	1.00	0.63	1.00		0.60	1.00		0.66	1.00	
Satd. Flow (perm)	958	1792	1490	1121	1771		1057	1588		1156	1645	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	167	60	63	320	23	140	68	77	20	93	77
RTOR Reduction (vph)	0	0	29	0	3	0	0	61	0	0	58	0
Lane Group Flow (vph)	42	167	32	63	340	0	140	84	0	20	112	0
Confl. Peds. (#/hr)	3		1	1		3	2		7	7		2
Confl. Bikes (#/hr)			1						3			
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	8%	8%	8%	7%	7%	7%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	34.0	31.5	31.5	36.6	32.8		12.7	12.7		12.7	12.7	
Effective Green, g (s)	34.0	31.5	31.5	36.6	32.8		12.7	12.7		12.7	12.7	
Actuated g/C Ratio	0.57	0.53	0.53	0.61	0.55		0.21	0.21		0.21	0.21	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	573	940	782	720	968		223	336		244	348	
v/s Ratio Prot	0.00	0.09		c0.01	c0.19			0.05			0.07	
v/s Ratio Perm	0.04		0.02	0.05			c0.13			0.02		
v/c Ratio	0.07	0.18	0.04	0.09	0.35		0.63	0.25		0.08	0.32	
Uniform Delay, d1	5.8	7.5	6.9	4.8	7.6		21.5	19.7		19.0	20.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.4	0.1	0.1	0.2		5.4	0.4		0.1	0.5	
Delay (s)	5.8	7.9	7.0	4.8	7.9		26.9	20.1		19.1	20.6	
Level of Service	A	A	A	A	A		C	C		B	C	
Approach Delay (s/veh)		7.4			7.4			23.4			20.4	
Approach LOS		A			A			C			C	

### Intersection Summary

HCM 2000 Control Delay (s/veh)	13.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

# HCM 6th Signalized Intersection Summary

## 2: NE 72nd Avenue & NE 63rd Street

11/12/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	154	55	58	294	21	129	63	71	18	86	71
Future Volume (veh/h)	39	154	55	58	294	21	129	63	71	18	86	71
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		1.00	0.99		0.98	0.99		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	1811	1811	1811	1811	1811	1811	1781	1781	1781	1796	1796	1796
Adj Flow Rate, veh/h	42	167	31	63	320	20	140	68	16	20	93	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	6	6	8	8	8	7	7	7
Cap, veh/h	630	960	794	765	914	57	316	299	70	340	315	61
Arrive On Green	0.04	0.53	0.53	0.05	0.54	0.54	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1725	1811	1499	1725	1686	105	1206	1387	326	1252	1458	282
Grp Volume(v), veh/h	42	167	31	63	0	340	140	0	84	20	0	111
Grp Sat Flow(s),veh/h/ln	1725	1811	1499	1725	0	1792	1206	0	1713	1252	0	1740
Q Serve(g_s), s	0.6	2.9	0.6	0.9	0.0	6.4	6.6	0.0	2.4	0.8	0.0	3.2
Cycle Q Clear(g_c), s	0.6	2.9	0.6	0.9	0.0	6.4	9.8	0.0	2.4	3.2	0.0	3.2
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.19	1.00		0.16
Lane Grp Cap(c), veh/h	630	960	794	765	0	971	316	0	370	340	0	376
V/C Ratio(X)	0.07	0.17	0.04	0.08	0.00	0.35	0.44	0.00	0.23	0.06	0.00	0.30
Avail Cap(c_a), veh/h	730	960	794	845	0	971	438	0	542	466	0	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)	0.84	0.84	0.84	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	5.9	7.3	6.8	5.5	0.0	7.8	23.8	0.0	19.4	20.7	0.0	19.7
Incr Delay (d2), s/veh	0.0	0.3	0.1	0.0	0.0	0.2	1.0	0.0	0.3	0.1	0.0	0.4
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	0.2	1.0	0.2	0.3	0.0	2.0	1.8	0.0	0.9	0.2	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	6.0	7.6	6.8	5.5	0.0	8.0	24.8	0.0	19.7	20.8	0.0	20.1
LnGrp LOS	A	A	A	A		A	C		B	C		C
Approach Vol, veh/h		240			403			224				131
Approach Delay, s/veh		7.2			7.6			22.9				20.2
Approach LOS		A			A			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.3	35.8		17.0	6.5	36.5		17.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	6.0	23.0		19.0	6.0	23.0		19.0				
Max Q Clear Time (g_c+I1), s	2.9	4.9		11.8	2.6	8.4		5.2				
Green Ext Time (p_c), s	0.0	0.9		0.5	0.0	1.7		0.5				

### Intersection Summary

HCM 6th Ctrl Delay, s/veh	12.6
HCM 6th LOS	B

HCM 6th TWSC  
3: NE 81st Avenue & NE 63rd Street

11/12/2023

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	12	189	42	16	246	7	38	1	10	21	2	36
Future Vol, veh/h	12	189	42	16	246	7	38	1	10	21	2	36
Conflicting Peds, #/hr	0	0	2	2	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	8	8	5	5	5	2	2	2
Mvmt Flow	13	205	46	17	267	8	41	1	11	23	2	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	275	0	0	253	0	0	583	565	230	565	584	272
Stage 1	-	-	-	-	-	-	256	256	-	305	305	-
Stage 2	-	-	-	-	-	-	327	309	-	260	279	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.15	6.55	6.25	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.12	5.52	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.545	4.045	3.345	3.518	4.018	3.318
Pot Cap-1 Maneuver	1254	-	-	1278	-	-	419	430	802	436	423	767
Stage 1	-	-	-	-	-	-	742	690	-	705	662	-
Stage 2	-	-	-	-	-	-	679	654	-	745	680	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1254	-	-	1276	-	-	388	419	800	422	412	766
Mov Cap-2 Maneuver	-	-	-	-	-	-	388	419	-	422	412	-
Stage 1	-	-	-	-	-	-	733	682	-	698	653	-
Stage 2	-	-	-	-	-	-	633	645	-	726	672	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.4			0.5			14.5			12		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	434	1254	-	-	1276	-	-	581
HCM Lane V/C Ratio	0.123	0.01	-	-	0.014	-	-	0.11
HCM Control Delay (s/veh)	14.5	7.9	-	-	7.9	-	-	12
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q (veh)	0.4	0	-	-	0	-	-	0.4

HCM 6th TWSC  
4: NE 58th Street & NE 81st Avenue

11/12/2023

Intersection						
Int Delay, s/veh	3.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↔	↔		↔	
Traffic Vol, veh/h	7	74	75	30	77	12
Future Vol, veh/h	7	74	75	30	77	12
Conflicting Peds, #/hr	1	0	0	1	1	1
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	11	11	5	5
Mvmt Flow	8	80	82	33	84	13

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	116	0	-	0	197
Stage 1	-	-	-	-	100
Stage 2	-	-	-	-	97
Critical Hdwy	4.12	-	-	-	6.45
Critical Hdwy Stg 1	-	-	-	-	5.45
Critical Hdwy Stg 2	-	-	-	-	5.45
Follow-up Hdwy	2.218	-	-	-	3.545
Pot Cap-1 Maneuver	1473	-	-	-	785
Stage 1	-	-	-	-	917
Stage 2	-	-	-	-	919
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1472	-	-	-	779
Mov Cap-2 Maneuver	-	-	-	-	779
Stage 1	-	-	-	-	911
Stage 2	-	-	-	-	918

Approach	EB	WB	SB
HCM Control Delay, s/v	0.6	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1472	-	-	-	798
HCM Lane V/C Ratio	0.005	-	-	-	0.121
HCM Control Delay (s/veh)	7.5	0	-	-	10.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q (veh)	0	-	-	-	0.4

HCM 6th TWSC  
5: NE 82nd Avenue & NE 58th Street

11/12/2023

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	15	131	74	28	0	82	2	26	0	2	0
Future Vol, veh/h	1	15	131	74	28	0	82	2	26	0	2	0
Conflicting Peds, #/hr	5	0	0	0	0	5	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	3	3	6	6	6	50	50	50
Mvmt Flow	1	16	142	80	30	0	89	2	28	0	2	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	35	0	0	158	0	0	280	284	87	299	355	35
Stage 1	-	-	-	-	-	-	89	89	-	195	195	-
Stage 2	-	-	-	-	-	-	191	195	-	104	160	-
Critical Hdwy	4.12	-	-	4.13	-	-	7.16	6.56	6.26	7.6	7	6.7
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.6	6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.6	6	-
Follow-up Hdwy	2.218	-	-	2.227	-	-	3.554	4.054	3.354	3.95	4.45	3.75
Pot Cap-1 Maneuver	1576	-	-	1416	-	-	664	618	961	569	501	916
Stage 1	-	-	-	-	-	-	909	813	-	708	658	-
Stage 2	-	-	-	-	-	-	802	732	-	797	683	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1568	-	-	1416	-	-	632	579	961	524	469	912
Mov Cap-2 Maneuver	-	-	-	-	-	-	632	579	-	524	469	-
Stage 1	-	-	-	-	-	-	908	812	-	704	617	-
Stage 2	-	-	-	-	-	-	754	687	-	771	682	-






















Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0			5.6			11.4			12.7		
HCM LOS							B			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	686	1568	-	-	1416	-	-	469
HCM Lane V/C Ratio	0.174	0.001	-	-	0.057	-	-	0.005
HCM Control Delay (s/veh)	11.4	7.3	0	-	7.7	0	-	12.7
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q (veh)	0.6	0	-	-	0.2	-	-	0

# HCM Signalized Intersection Capacity Analysis

## 1: NE Andresen Road & NE 63rd Street






















11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	332	325	171	258	107	442	849	124	93	676	197
Future Volume (vph)	194	332	325	171	258	107	442	849	124	93	676	197
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.96		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3269		1752	3335		1770	3466		1752	3374	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	3269		1752	3335		1770	3466		1752	3374	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	332	325	171	258	107	442	849	124	93	676	197
RTOR Reduction (vph)	0	207	0	0	53	0	0	12	0	0	30	0
Lane Group Flow (vph)	194	450	0	171	312	0	442	961	0	93	843	0
Confl. Peds. (#/hr)	1		7	7		1	2					2
Confl. Bikes (#/hr)			2			2			1			1
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	10.4	16.0		9.8	15.4		24.6	40.3		7.9	23.6	
Effective Green, g (s)	10.4	16.0		9.8	15.4		24.6	40.3		7.9	23.6	
Actuated g/C Ratio	0.12	0.18		0.11	0.17		0.27	0.45		0.09	0.26	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	206	581		190	570		483	1551		153	884	
v/s Ratio Prot	c0.11	c0.14		0.10	0.09		c0.25	0.28		0.05	c0.25	
v/s Ratio Perm												
v/c Ratio	0.94	0.77		0.90	0.55		0.92	0.62		0.61	0.95	
Uniform Delay, d1	39.5	35.3		39.6	34.1		31.7	19.0		39.6	32.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	46.2	9.7		38.6	3.7		21.9	0.7		6.7	19.9	
Delay (s)	85.7	45.0		78.2	37.9		53.6	19.7		46.2	52.5	
Level of Service	F	D		E	D		D	B		D	D	
Approach Delay (s/veh)		54.3			50.7			30.3			51.9	
Approach LOS		D			D			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay (s/veh)			44.2				HCM 2000 Level of Service				D	
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			90.0				Sum of lost time (s)			16.0		
Intersection Capacity Utilization			92.3%				ICU Level of Service			F		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM 6th Signalized Intersection Summary

## 1: NE Andresen Road & NE 63rd Street

11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	332	325	171	258	107	442	849	124	93	676	197
Future Volume (veh/h)	194	332	325	171	258	107	442	849	124	93	676	197
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	1.00		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	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	194	332	115	171	258	58	442	849	114	93	676	168
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	1	3	3	3	2	2	2	3	3	3
Cap, veh/h	207	568	193	192	603	133	447	1346	181	119	682	169
Arrive On Green	0.12	0.22	0.22	0.11	0.21	0.21	0.25	0.43	0.43	0.07	0.24	0.24
Sat Flow, veh/h	1795	2607	885	1767	2857	630	1781	3142	422	1767	2789	692
Grp Volume(v), veh/h	194	226	221	171	157	159	442	480	483	93	427	417
Grp Sat Flow(s),veh/h/ln	1795	1791	1701	1767	1763	1724	1781	1777	1787	1767	1763	1718
Q Serve(g_s), s	9.6	10.2	10.5	8.6	6.9	7.2	22.2	19.1	19.1	4.7	21.7	21.8
Cycle Q Clear(g_c), s	9.6	10.2	10.5	8.6	6.9	7.2	22.2	19.1	19.1	4.7	21.7	21.8
Prop In Lane	1.00		0.52	1.00		0.37	1.00		0.24	1.00		0.40
Lane Grp Cap(c), veh/h	207	390	370	192	372	364	447	761	765	119	431	420
V/C Ratio(X)	0.94	0.58	0.60	0.89	0.42	0.44	0.99	0.63	0.63	0.78	0.99	0.99
Avail Cap(c_a), veh/h	207	390	370	192	372	364	447	761	765	204	431	420
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	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	31.5	31.6	39.6	30.7	30.8	33.6	20.2	20.2	41.3	33.9	33.9
Incr Delay (d2), s/veh	44.5	6.2	6.9	33.8	3.2	3.5	39.3	1.7	1.7	10.5	40.9	41.8
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	6.6	4.9	4.8	5.4	3.2	3.3	13.9	7.6	7.6	2.3	13.7	13.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	84.0	37.7	38.6	73.4	34.0	34.3	72.9	21.8	21.8	51.9	74.9	75.8
LnGrp LOS	F	D	D	E	C	C	E	C	C	D	E	E
Approach Vol, veh/h		641			487			1405			937	
Approach Delay, s/veh		52.0			47.9			37.9			73.0	
Approach LOS		D			D			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.8	23.6	26.6	26.0	14.4	23.0	10.1	42.5				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	9.8	19.6	22.6	22.0	10.4	19.0	10.4	34.2				
Max Q Clear Time (g_c+I1), s	10.6	12.5	24.2	23.8	11.6	9.2	6.7	21.1				
Green Ext Time (p_c), s	0.0	1.4	0.0	0.0	0.0	1.2	0.1	4.9				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh			51.4									
HCM 6th LOS			D									

# HCM Signalized Intersection Capacity Analysis

## 2: NE 72nd Avenue & NE 63rd Street

11/12/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	392	58	25	353	20	85	99	25	29	103	87
Future Volume (vph)	94	392	58	25	353	20	85	99	25	29	103	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1550	1764	1846		1770	1798		1748	1707	
Flt Permitted	0.43	1.00	1.00	0.53	1.00		0.51	1.00		0.68	1.00	
Satd. Flow (perm)	816	1881	1550	985	1846		959	1798		1246	1707	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	94	392	58	25	353	20	85	99	25	29	103	87
RTOR Reduction (vph)	0	0	22	0	3	0	0	18	0	0	62	0
Lane Group Flow (vph)	94	392	36	25	370	0	85	106	0	29	128	0
Confl. Peds. (#/hr)	1		6	6		1			2	2		
Confl. Bikes (#/hr)			1			1						1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	42.1	36.8	36.8	33.9	32.6		9.9	9.9		9.9	9.9	
Effective Green, g (s)	42.1	36.8	36.8	33.9	32.6		9.9	9.9		9.9	9.9	
Actuated g/C Ratio	0.70	0.61	0.61	0.56	0.54		0.17	0.17		0.17	0.17	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	661	1153	950	573	1002		158	296		205	281	
v/s Ratio Prot	c0.01	c0.21		0.00	c0.20			0.06			0.08	
v/s Ratio Perm	0.09		0.02	0.02			c0.09			0.02		
v/c Ratio	0.14	0.34	0.04	0.04	0.37		0.54	0.36		0.14	0.46	
Uniform Delay, d1	3.3	5.7	4.6	5.8	7.8		23.0	22.2		21.4	22.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.8	0.1	0.0	0.2		3.5	0.7		0.3	1.2	
Delay (s)	3.4	6.5	4.7	5.8	8.1		26.5	23.0		21.7	23.8	
Level of Service	A	A	A	A	A		C	C		C	C	
Approach Delay (s/veh)		5.7			7.9			24.4			23.5	
Approach LOS		A			A			C			C	

### Intersection Summary

HCM 2000 Control Delay (s/veh)	12.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



# HCM 6th Signalized Intersection Summary

## 2: NE 72nd Avenue & NE 63rd Street

11/12/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	392	58	25	353	20	85	99	25	29	103	87
Future Volume (veh/h)	94	392	58	25	353	20	85	99	25	29	103	87
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		1.00	1.00		0.97
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	1870	1870	1870	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	94	392	36	25	353	17	85	99	8	29	103	25
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	1	2	2	2	2	2	2	3	3	3
Cap, veh/h	696	1125	929	641	989	48	259	298	24	278	250	61
Arrive On Green	0.07	0.60	0.60	0.03	0.56	0.56	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1795	1885	1557	1781	1767	85	1257	1707	138	1273	1433	348
Grp Volume(v), veh/h	94	392	36	25	0	370	85	0	107	29	0	128
Grp Sat Flow(s),veh/h/ln	1795	1885	1557	1781	0	1852	1257	0	1845	1273	0	1781
Q Serve(g_s), s	1.2	6.3	0.6	0.4	0.0	6.6	3.9	0.0	3.0	1.2	0.0	3.8
Cycle Q Clear(g_c), s	1.2	6.3	0.6	0.4	0.0	6.6	7.7	0.0	3.0	4.3	0.0	3.8
Prop In Lane	1.00		1.00	1.00		0.05	1.00		0.07	1.00		0.20
Lane Grp Cap(c), veh/h	696	1125	929	641	0	1036	259	0	322	278	0	311
V/C Ratio(X)	0.14	0.35	0.04	0.04	0.00	0.36	0.33	0.00	0.33	0.10	0.00	0.41
Avail Cap(c_a), veh/h	757	1125	929	754	0	1036	438	0	584	459	0	564
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)	0.55	0.55	0.55	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	4.8	6.2	5.0	5.3	0.0	7.3	25.4	0.0	21.7	23.6	0.0	22.0
Incr Delay (d2), s/veh	0.0	0.5	0.0	0.0	0.0	0.2	0.7	0.0	0.6	0.2	0.0	0.9
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	0.3	1.9	0.1	0.1	0.0	2.0	1.1	0.0	1.3	0.4	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	4.8	6.6	5.0	5.3	0.0	7.5	26.2	0.0	22.3	23.7	0.0	22.9
LnGrp LOS	A	A	A	A		A	C		C	C		C
Approach Vol, veh/h		522			395			192				157
Approach Delay, s/veh		6.2			7.4			24.0				23.0
Approach LOS		A			A			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.7	39.8		14.5	8.0	37.6		14.5				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	5.5	23.5		19.0	6.0	23.0		19.0				
Max Q Clear Time (g_c+I1), s	2.4	8.3		9.7	3.2	8.6		6.3				
Green Ext Time (p_c), s	0.0	2.1		0.5	0.0	1.8		0.6				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh				11.3								
HCM 6th LOS				B								

HCM 6th TWSC  
 3: NE 81st Avenue & NE 63rd Street

11/12/2023

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗			↕			↕	
Traffic Vol, veh/h	41	335	34	19	302	23	52	2	10	14	2	23
Future Vol, veh/h	41	335	34	19	302	23	52	2	10	14	2	23
Conflicting Peds, #/hr	3	0	1	1	0	3	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	1	1	1	2	2	2	4	4	4	2	2	2
Mvmt Flow	41	335	34	19	302	23	52	2	10	14	2	23

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	328	0	0	370	0	0	799	801	353	795	807	317
Stage 1	-	-	-	-	-	-	435	435	-	355	355	-
Stage 2	-	-	-	-	-	-	364	366	-	440	452	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.14	6.54	6.24	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.12	5.52	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.536	4.036	3.336	3.518	4.018	3.318
Pot Cap-1 Maneuver	1237	-	-	1189	-	-	301	315	686	305	315	724
Stage 1	-	-	-	-	-	-	596	577	-	662	630	-
Stage 2	-	-	-	-	-	-	651	619	-	596	570	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1233	-	-	1188	-	-	279	299	685	287	299	722
Mov Cap-2 Maneuver	-	-	-	-	-	-	279	299	-	287	299	-
Stage 1	-	-	-	-	-	-	576	557	-	638	618	-
Stage 2	-	-	-	-	-	-	618	607	-	566	551	-

Approach	EB		WB		NB		SB	
HCM Control Delay, s/v	0.8		0.4		19.7		13.8	
HCM LOS					C		B	

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	308	1233	-	-	1188	-	-	447
HCM Lane V/C Ratio	0.208	0.033	-	-	0.016	-	-	0.087
HCM Control Delay (s/veh)	19.7	8	-	-	8.1	-	-	13.8
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q (veh)	0.8	0.1	-	-	0	-	-	0.3

HCM 6th TWSC  
4: NE 58th Street & NE 81st Avenue

11/12/2023

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	9	90	97	78	68	9
Future Vol, veh/h	9	90	97	78	68	9
Conflicting Peds, #/hr	1	0	0	1	1	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	92	92	92	92	92	92
Heavy Vehicles, %	1	1	3	3	2	2
Mvmt Flow	10	98	105	85	74	10

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	191	0	-	0	268
Stage 1	-	-	-	-	149
Stage 2	-	-	-	-	119
Critical Hdwy	4.11	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.209	-	-	-	3.518
Pot Cap-1 Maneuver	1389	-	-	-	721
Stage 1	-	-	-	-	879
Stage 2	-	-	-	-	906
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1388	-	-	-	714
Mov Cap-2 Maneuver	-	-	-	-	714
Stage 1	-	-	-	-	871
Stage 2	-	-	-	-	905

Approach	EB	WB	SB
HCM Control Delay, s/v	0.7	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1388	-	-	-	731
HCM Lane V/C Ratio	0.007	-	-	-	0.114
HCM Control Delay (s/veh)	7.6	0	-	-	10.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q (veh)	0	-	-	-	0.4

HCM 6th TWSC  
5: NE 82nd Avenue & NE 58th Street

11/12/2023

Intersection												
Int Delay, s/veh	8.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	19	124	92	18	0	158	5	134	0	3	0
Future Vol, veh/h	0	19	124	92	18	0	158	5	134	0	3	0
Conflicting Peds, #/hr	3	0	2	2	0	3	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	1	1	1	33	33	33
Mvmt Flow	0	21	135	100	20	0	172	5	146	0	3	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	23	0	0	158	0	0	313	314	91	387	381	23
Stage 1	-	-	-	-	-	-	91	91	-	223	223	-
Stage 2	-	-	-	-	-	-	222	223	-	164	158	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.11	6.51	6.21	7.43	6.83	6.53
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.43	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.43	5.83	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.509	4.009	3.309	3.797	4.297	3.597
Pot Cap-1 Maneuver	1579	-	-	1409	-	-	642	603	969	520	506	971
Stage 1	-	-	-	-	-	-	919	821	-	714	665	-
Stage 2	-	-	-	-	-	-	783	721	-	770	712	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1574	-	-	1406	-	-	602	557	967	413	467	968
Mov Cap-2 Maneuver	-	-	-	-	-	-	602	557	-	413	467	-
Stage 1	-	-	-	-	-	-	917	819	-	712	615	-
Stage 2	-	-	-	-	-	-	723	667	-	650	711	-





















Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0	6.5	13.9	12.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	724	1574	-	-	1406	-	-	467
HCM Lane V/C Ratio	0.446	-	-	-	0.071	-	-	0.007
HCM Control Delay (s/veh)	13.9	0	-	-	7.8	0	-	12.8
HCM Lane LOS	B	A	-	-	A	A	-	B
HCM 95th %tile Q (veh)	2.3	0	-	-	0.2	-	-	0

# HCM Signalized Intersection Capacity Analysis

## 1: NE Andresen Road & NE 63rd Street





















11/12/2023

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	104	173	190	167	216	98	180	427	67	55	614	106	
Future Volume (vph)	104	173	190	167	216	98	180	427	67	55	614	106	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95		
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00		
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Frt	1.00	0.92		1.00	0.95		1.00	0.98		1.00	0.98		
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)	1656	3025		1719	3277		1736	3394		1703	3331		
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00		
Satd. Flow (perm)	1656	3025		1719	3277		1736	3394		1703	3331		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	113	188	207	182	235	107	196	464	73	60	667	115	
RTOR Reduction (vph)	0	175	0	0	84	0	0	15	0	0	19	0	
Lane Group Flow (vph)	113	220	0	182	258	0	196	522	0	60	763	0	
Confl. Peds. (#/hr)			3	3									
Confl. Bikes (#/hr)			1						2				
Heavy Vehicles (%)	9%	9%	9%	5%	5%	5%	4%	4%	4%	6%	6%	6%	
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA		
Protected Phases	5	2		1	6		3	8		7	4		
Permitted Phases													
Actuated Green, G (s)	6.3	10.7		9.2	13.6		13.6	28.6		5.5	20.5		
Effective Green, g (s)	6.3	10.7		9.2	13.6		13.6	28.6		5.5	20.5		
Actuated g/C Ratio	0.09	0.15		0.13	0.19		0.19	0.41		0.08	0.29		
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0		
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)	149	462		225	636		337	1386		133	975		
v/s Ratio Prot	0.07	0.07		c0.11	c0.08		c0.11	0.15		0.04	c0.23		
v/s Ratio Perm													
v/c Ratio	0.76	0.48		0.81	0.41		0.58	0.38		0.45	0.78		
Uniform Delay, d1	31.1	27.1		29.5	24.7		25.6	14.5		30.8	22.7		
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2	19.6	3.5		18.9	1.9		2.5	0.2		2.4	4.2		
Delay (s)	50.7	30.6		48.4	26.6		28.2	14.6		33.2	26.9		
Level of Service	D	C		D	C		C	B		C	C		
Approach Delay (s/veh)		35.0			34.2			18.3			27.3		
Approach LOS		D			C			B			C		
<b>Intersection Summary</b>													
HCM 2000 Control Delay (s/veh)			27.7									HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio			0.66										
Actuated Cycle Length (s)			70.0									Sum of lost time (s)	16.0
Intersection Capacity Utilization			67.9%									ICU Level of Service	C
Analysis Period (min)			15										
c Critical Lane Group													

# HCM 6th Signalized Intersection Summary

## 1: NE Andresen Road & NE 63rd Street

11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	104	173	190	167	216	98	180	427	67	55	614	106
Future Volume (veh/h)	104	173	190	167	216	98	180	427	67	55	614	106
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		1.00	1.00		0.99	1.00		1.00
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	1767	1767	1767	1826	1826	1826	1841	1841	1841	1811	1811	1811
Adj Flow Rate, veh/h	113	188	34	182	235	43	196	464	59	60	667	97
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	9	9	9	5	5	5	4	4	4	6	6	6
Cap, veh/h	142	806	143	199	921	166	213	1011	128	85	760	110
Arrive On Green	0.08	0.28	0.28	0.11	0.31	0.31	0.12	0.32	0.32	0.05	0.25	0.25
Sat Flow, veh/h	1682	2841	504	1739	2935	528	1753	3118	394	1725	3015	438
Grp Volume(v), veh/h	113	109	113	182	137	141	196	259	264	60	380	384
Grp Sat Flow(s),veh/h/ln	1682	1678	1666	1739	1735	1729	1753	1749	1763	1725	1721	1732
Q Serve(g_s), s	4.6	3.5	3.6	7.2	4.1	4.3	7.7	8.2	8.3	2.4	14.9	14.9
Cycle Q Clear(g_c), s	4.6	3.5	3.6	7.2	4.1	4.3	7.7	8.2	8.3	2.4	14.9	14.9
Prop In Lane	1.00		0.30	1.00		0.31	1.00		0.22	1.00		0.25
Lane Grp Cap(c), veh/h	142	476	473	199	544	542	213	567	572	85	434	437
V/C Ratio(X)	0.80	0.23	0.24	0.92	0.25	0.26	0.92	0.46	0.46	0.71	0.88	0.88
Avail Cap(c_a), veh/h	183	476	473	199	544	542	213	567	572	168	455	458
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	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.5	19.2	19.3	30.7	17.9	17.9	30.4	18.8	18.8	32.8	25.1	25.2
Incr Delay (d2), s/veh	16.9	1.1	1.2	38.6	1.0	1.1	40.4	0.6	0.6	10.3	16.9	17.0
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	2.4	1.4	1.4	5.0	1.7	1.7	5.4	3.1	3.1	1.2	7.5	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	48.4	20.3	20.4	69.2	18.9	19.0	70.8	19.3	19.4	43.1	42.0	42.2
LnGrp LOS	D	C	C	E	B	B	E	B	B	D	D	D
Approach Vol, veh/h		335			460			719			824	
Approach Delay, s/veh		29.8			38.8			33.4			42.2	
Approach LOS		C			D			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.0	23.9	12.5	21.6	9.9	26.0	7.4	26.7				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	8.0	19.0	8.5	18.5	7.6	19.4	6.8	20.2				
Max Q Clear Time (g_c+I1), s	9.2	5.6	9.7	16.9	6.6	6.3	4.4	10.3				
Green Ext Time (p_c), s	0.0	0.9	0.0	0.7	0.0	1.2	0.0	2.1				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh				37.0								
HCM 6th LOS				D								

# HCM Signalized Intersection Capacity Analysis























## 2: NE 72nd Avenue & NE 63rd Street

11/12/2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	161	55	59	312	21	129	63	72	18	86	71
Future Volume (vph)	39	161	55	59	312	21	129	63	72	18	86	71
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.92		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1700	1792	1490	1702	1773		1669	1587		1671	1645	
Flt Permitted	0.52	1.00	1.00	0.62	1.00		0.60	1.00		0.65	1.00	
Satd. Flow (perm)	932	1792	1490	1109	1773		1057	1587		1152	1645	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	175	60	64	339	23	140	68	78	20	93	77
RTOR Reduction (vph)	0	0	29	0	3	0	0	61	0	0	58	0
Lane Group Flow (vph)	42	175	32	64	359	0	140	85	0	20	112	0
Confl. Peds. (#/hr)	3		1	1		3	2		7	7		2
Confl. Bikes (#/hr)			1						3			
Heavy Vehicles (%)	6%	6%	6%	6%	6%	6%	8%	8%	8%	7%	7%	7%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	33.9	31.5	31.5	36.7	32.9		12.7	12.7		12.7	12.7	
Effective Green, g (s)	33.9	31.5	31.5	36.7	32.9		12.7	12.7		12.7	12.7	
Actuated g/C Ratio	0.56	0.53	0.53	0.61	0.55		0.21	0.21		0.21	0.21	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	557	940	782	715	972		223	335		243	348	
v/s Ratio Prot	0.00	0.10		c0.01	c0.20			0.05			0.07	
v/s Ratio Perm	0.04		0.02	0.05			c0.13			0.02		
v/c Ratio	0.08	0.19	0.04	0.09	0.37		0.63	0.25		0.08	0.32	
Uniform Delay, d1	5.8	7.5	6.9	4.7	7.7		21.5	19.7		19.0	20.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.4	0.1	0.1	0.2		5.4	0.4		0.1	0.5	
Delay (s)	5.9	7.9	7.0	4.8	7.9		26.9	20.1		19.1	20.6	
Level of Service	A	A	A	A	A		C	C		B	C	
Approach Delay (s/veh)		7.4			7.4			23.4			20.4	
Approach LOS		A			A			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay (s/veh)			13.4			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.43									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			51.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 6th Signalized Intersection Summary  
 2: NE 72nd Avenue & NE 63rd Street

11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	161	55	59	312	21	129	63	72	18	86	71
Future Volume (veh/h)	39	161	55	59	312	21	129	63	72	18	86	71
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		1.00	0.99		0.98	0.99		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	1811	1811	1811	1811	1811	1811	1781	1781	1781	1796	1796	1796
Adj Flow Rate, veh/h	42	175	31	64	339	20	140	68	17	20	93	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	6	6	6	6	6	6	8	8	8	7	7	7
Cap, veh/h	615	959	793	759	918	54	316	295	74	339	315	61
Arrive On Green	0.04	0.53	0.53	0.05	0.54	0.54	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1725	1811	1499	1725	1693	100	1206	1368	342	1251	1458	282
Grp Volume(v), veh/h	42	175	31	64	0	359	140	0	85	20	0	111
Grp Sat Flow(s),veh/h/ln	1725	1811	1499	1725	0	1793	1206	0	1710	1251	0	1740
Q Serve(g_s), s	0.6	3.0	0.6	1.0	0.0	6.9	6.6	0.0	2.5	0.8	0.0	3.2
Cycle Q Clear(g_c), s	0.6	3.0	0.6	1.0	0.0	6.9	9.8	0.0	2.5	3.3	0.0	3.2
Prop In Lane	1.00		1.00	1.00		0.06	1.00		0.20	1.00		0.16
Lane Grp Cap(c), veh/h	615	959	793	759	0	972	316	0	369	339	0	376
V/C Ratio(X)	0.07	0.18	0.04	0.08	0.00	0.37	0.44	0.00	0.23	0.06	0.00	0.30
Avail Cap(c_a), veh/h	704	959	793	826	0	972	438	0	541	465	0	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)	0.83	0.83	0.83	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	6.0	7.4	6.8	5.5	0.0	7.9	23.8	0.0	19.4	20.8	0.0	19.7
Incr Delay (d2), s/veh	0.0	0.3	0.1	0.0	0.0	0.2	1.0	0.0	0.3	0.1	0.0	0.4
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	0.2	1.0	0.2	0.3	0.0	2.1	1.8	0.0	0.9	0.2	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	6.0	7.7	6.9	5.5	0.0	8.1	24.8	0.0	19.7	20.8	0.0	20.1
LnGrp LOS	A	A	A	A		A	C		B	C		C
Approach Vol, veh/h		248			423			225				131
Approach Delay, s/veh		7.3			7.7			22.9				20.2
Approach LOS		A			A			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.3	35.8		17.0	6.5	36.5		17.0				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	5.6	23.4		19.0	5.6	23.4		19.0				
Max Q Clear Time (g_c+I1), s	3.0	5.0		11.8	2.6	8.9		5.3				
Green Ext Time (p_c), s	0.0	0.9		0.5	0.0	1.8		0.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh				12.5								
HCM 6th LOS				B								



HCM 6th TWSC  
 3: NE 81st Avenue & NE 63rd Street

11/12/2023

Intersection												
Int Delay, s/veh	3.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↕			↕	
Traffic Vol, veh/h	20	189	42	16	246	11	38	1	10	32	4	55
Future Vol, veh/h	20	189	42	16	246	11	38	1	10	32	4	55
Conflicting Peds, #/hr	0	0	2	2	0	0	1	0	0	0	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	8	8	8	8	8	8	5	5	5	2	2	2
Mvmt Flow	22	205	46	17	267	12	41	1	11	35	4	60

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	279	0	0	253	0	0	614	587	230	585	604	274
Stage 1	-	-	-	-	-	-	274	274	-	307	307	-
Stage 2	-	-	-	-	-	-	340	313	-	278	297	-
Critical Hdwy	4.18	-	-	4.18	-	-	7.15	6.55	6.25	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.12	5.52	-
Follow-up Hdwy	2.272	-	-	2.272	-	-	3.545	4.045	3.345	3.518	4.018	3.318
Pot Cap-1 Maneuver	1250	-	-	1278	-	-	400	418	802	422	412	765
Stage 1	-	-	-	-	-	-	726	678	-	703	661	-
Stage 2	-	-	-	-	-	-	669	652	-	728	668	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1250	-	-	1276	-	-	356	404	800	406	398	764
Mov Cap-2 Maneuver	-	-	-	-	-	-	356	404	-	406	398	-
Stage 1	-	-	-	-	-	-	712	664	-	690	652	-
Stage 2	-	-	-	-	-	-	604	644	-	704	655	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	0.6			0.5			15.3			12.7		
HCM LOS							C			B		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	403	1250	-	-	1276	-	-	566
HCM Lane V/C Ratio	0.132	0.017	-	-	0.014	-	-	0.175
HCM Control Delay (s/veh)	15.3	7.9	-	-	7.9	-	-	12.7
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q (veh)	0.5	0.1	-	-	0	-	-	0.6

HCM 6th TWSC  
4: NE 58th Street & NE 81st Avenue

11/12/2023

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↶	↷		↶	↷
Traffic Vol, veh/h	7	74	75	30	79	12
Future Vol, veh/h	7	74	75	30	79	12
Conflicting Peds, #/hr	1	0	0	1	1	1
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	11	11	5	5
Mvmt Flow	8	80	82	33	86	13

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	116	0	-	0	197
Stage 1	-	-	-	-	100
Stage 2	-	-	-	-	97
Critical Hdwy	4.12	-	-	-	6.45
Critical Hdwy Stg 1	-	-	-	-	5.45
Critical Hdwy Stg 2	-	-	-	-	5.45
Follow-up Hdwy	2.218	-	-	-	3.545
Pot Cap-1 Maneuver	1473	-	-	-	785
Stage 1	-	-	-	-	917
Stage 2	-	-	-	-	919
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1472	-	-	-	779
Mov Cap-2 Maneuver	-	-	-	-	779
Stage 1	-	-	-	-	911
Stage 2	-	-	-	-	918

Approach	EB	WB	SB
HCM Control Delay, s/v	0.6	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1472	-	-	-	797
HCM Lane V/C Ratio	0.005	-	-	-	0.124
HCM Control Delay (s/veh)	7.5	0	-	-	10.2
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q (veh)	0	-	-	-	0.4

HCM 6th TWSC  
5: NE 82nd Avenue & NE 58th Street

11/12/2023

Intersection												
Int Delay, s/veh	5.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	15	133	74	28	0	82	2	26	0	2	0
Future Vol, veh/h	1	15	133	74	28	0	82	2	26	0	2	0
Conflicting Peds, #/hr	5	0	0	0	0	5	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	3	3	6	6	6	50	50	50
Mvmt Flow	1	16	145	80	30	0	89	2	28	0	2	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	35	0	0	161	0	0	282	286	89	301	358	35
Stage 1	-	-	-	-	-	-	91	91	-	195	195	-
Stage 2	-	-	-	-	-	-	191	195	-	106	163	-
Critical Hdwy	4.12	-	-	4.13	-	-	7.16	6.56	6.26	7.6	7	6.7
Critical Hdwy Stg 1	-	-	-	-	-	-	6.16	5.56	-	6.6	6	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.16	5.56	-	6.6	6	-
Follow-up Hdwy	2.218	-	-	2.227	-	-	3.554	4.054	3.354	3.95	4.45	3.75
Pot Cap-1 Maneuver	1576	-	-	1412	-	-	662	617	958	567	499	916
Stage 1	-	-	-	-	-	-	906	812	-	708	658	-
Stage 2	-	-	-	-	-	-	802	732	-	795	681	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1568	-	-	1412	-	-	630	578	958	522	467	912
Mov Cap-2 Maneuver	-	-	-	-	-	-	630	578	-	522	467	-
Stage 1	-	-	-	-	-	-	905	811	-	704	617	-
Stage 2	-	-	-	-	-	-	753	686	-	769	680	-






















Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0	5.6	11.4	12.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	684	1568	-	-	1412	-	-	467
HCM Lane V/C Ratio	0.175	0.001	-	-	0.057	-	-	0.005
HCM Control Delay (s/veh)	11.4	7.3	0	-	7.7	0	-	12.7
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q (veh)	0.6	0	-	-	0.2	-	-	0

# HCM Signalized Intersection Capacity Analysis

## 1: NE Andresen Road & NE 63rd Street






















11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	194	336	325	177	260	113	442	849	133	103	676	197
Future Volume (vph)	194	336	325	177	260	113	442	849	133	103	676	197
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	0.95		1.00	0.95	
Frbp, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.95		1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	3270		1752	3329		1770	3461		1752	3374	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	3270		1752	3329		1770	3461		1752	3374	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	194	336	325	177	260	113	442	849	133	103	676	197
RTOR Reduction (vph)	0	203	0	0	57	0	0	13	0	0	30	0
Lane Group Flow (vph)	194	458	0	177	316	0	442	969	0	103	843	0
Confl. Peds. (#/hr)	1		7	7		1	2					2
Confl. Bikes (#/hr)			2			2			1			1
Heavy Vehicles (%)	1%	1%	1%	3%	3%	3%	2%	2%	2%	3%	3%	3%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	10.4	16.0		10.2	15.8		24.3	40.6		7.2	23.5	
Effective Green, g (s)	10.4	16.0		10.2	15.8		24.3	40.6		7.2	23.5	
Actuated g/C Ratio	0.12	0.18		0.11	0.18		0.27	0.45		0.08	0.26	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	206	581		198	584		477	1561		140	880	
v/s Ratio Prot	c0.11	c0.14		0.10	0.09		c0.25	0.28		0.06	c0.25	
v/s Ratio Perm												
v/c Ratio	0.94	0.79		0.89	0.54		0.93	0.62		0.74	0.96	
Uniform Delay, d1	39.5	35.4		39.4	33.8		32.0	18.8		40.5	32.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	46.2	10.4		36.0	3.6		24.0	0.8		18.1	20.6	
Delay (s)	85.7	45.8		75.4	37.4		56.0	19.6		58.6	53.4	
Level of Service	F	D		E	D		E	B		E	D	
Approach Delay (s/veh)		54.8			49.6			30.9			53.9	
Approach LOS		D			D			C			D	
<b>Intersection Summary</b>												
HCM 2000 Control Delay (s/veh)			44.9			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.91									
Actuated Cycle Length (s)			90.0			Sum of lost time (s)				16.0		
Intersection Capacity Utilization			92.7%			ICU Level of Service				F		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM 6th Signalized Intersection Summary

## 1: NE Andresen Road & NE 63rd Street























11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	194	336	325	177	260	113	442	849	133	103	676	197
Future Volume (veh/h)	194	336	325	177	260	113	442	849	133	103	676	197
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	1.00		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	1856	1856	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	194	336	115	177	260	64	442	849	123	103	676	168
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	1	3	3	3	2	2	2	3	3	3
Cap, veh/h	207	558	187	200	592	143	447	1311	190	130	682	169
Arrive On Green	0.12	0.21	0.21	0.11	0.21	0.21	0.25	0.42	0.42	0.07	0.24	0.24
Sat Flow, veh/h	1795	2615	878	1767	2802	675	1781	3108	450	1767	2789	692
Grp Volume(v), veh/h	194	228	223	177	161	163	442	485	487	103	427	417
Grp Sat Flow(s),veh/h/ln	1795	1791	1702	1767	1763	1715	1781	1777	1782	1767	1763	1718
Q Serve(g_s), s	9.6	10.3	10.7	8.9	7.2	7.4	22.2	19.6	19.6	5.2	21.7	21.8
Cycle Q Clear(g_c), s	9.6	10.3	10.7	8.9	7.2	7.4	22.2	19.6	19.6	5.2	21.7	21.8
Prop In Lane	1.00		0.52	1.00		0.39	1.00		0.25	1.00		0.40
Lane Grp Cap(c), veh/h	207	382	363	200	372	362	447	749	752	130	431	420
V/C Ratio(X)	0.94	0.60	0.61	0.88	0.43	0.45	0.99	0.65	0.65	0.79	0.99	0.99
Avail Cap(c_a), veh/h	207	382	363	200	372	362	447	749	752	169	431	420
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	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.5	31.9	32.0	39.3	30.8	30.9	33.6	20.7	20.7	41.0	33.9	33.9
Incr Delay (d2), s/veh	44.5	6.7	7.6	31.9	3.4	3.7	39.3	2.0	1.9	17.1	40.9	41.8
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	6.6	5.0	4.9	5.5	3.3	3.3	13.9	7.8	7.8	2.8	13.7	13.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	84.0	38.6	39.6	71.2	34.2	34.6	72.9	22.6	22.6	58.1	74.9	75.8
LnGrp LOS	F	D	D	E	C	C	E	C	C	E	E	E
Approach Vol, veh/h		645			501			1414			947	
Approach Delay, s/veh		52.6			47.4			38.4			73.4	
Approach LOS		D			D			D			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.2	23.2	26.6	26.0	14.4	23.0	10.6	42.0				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	10.2	19.2	22.6	22.0	10.4	19.0	8.6	36.0				
Max Q Clear Time (g_c+I1), s	10.9	12.7	24.2	23.8	11.6	9.4	7.2	21.6				
Green Ext Time (p_c), s	0.0	1.4	0.0	0.0	0.0	1.2	0.0	5.2				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh			51.7									
HCM 6th LOS			D									

# HCM Signalized Intersection Capacity Analysis

## 2: NE 72nd Avenue & NE 63rd Street























11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	94	415	58	27	367	20	85	99	27	29	103	87
Future Volume (vph)	94	415	58	27	367	20	85	99	27	29	103	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frbp, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1881	1550	1765	1846		1770	1794		1748	1707	
Flt Permitted	0.44	1.00	1.00	0.51	1.00		0.51	1.00		0.68	1.00	
Satd. Flow (perm)	819	1881	1550	955	1846		959	1794		1244	1707	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	94	415	58	27	367	20	85	99	27	29	103	87
RTOR Reduction (vph)	0	0	24	0	2	0	0	20	0	0	61	0
Lane Group Flow (vph)	94	415	34	27	385	0	85	106	0	29	129	0
Confl. Peds. (#/hr)	1		6	6		1			2	2		
Confl. Bikes (#/hr)			1			1						1
Heavy Vehicles (%)	1%	1%	1%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Turn Type	pm+pt	NA	Perm	pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	41.1	35.6	35.6	35.1	32.6		9.9	9.9		9.9	9.9	
Effective Green, g (s)	41.1	35.6	35.6	35.1	32.6		9.9	9.9		9.9	9.9	
Actuated g/C Ratio	0.69	0.59	0.59	0.59	0.54		0.17	0.17		0.17	0.17	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	649	1116	919	592	1002		158	296		205	281	
v/s Ratio Prot	c0.01	c0.22		0.00	0.21			0.06			0.08	
v/s Ratio Perm	0.09		0.02	0.02			c0.09			0.02		
v/c Ratio	0.14	0.37	0.04	0.05	0.38		0.54	0.36		0.14	0.46	
Uniform Delay, d1	3.5	6.4	5.1	5.2	7.9		23.0	22.2		21.4	22.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	1.0	0.1	0.0	0.2		3.5	0.7		0.3	1.2	
Delay (s)	3.6	7.3	5.2	5.3	8.2		26.5	23.0		21.7	23.8	
Level of Service	A	A	A	A	A		C	C		C	C	
Approach Delay (s/veh)		6.5			8.0			24.4			23.5	
Approach LOS		A			A			C			C	
<b>Intersection Summary</b>												
HCM 2000 Control Delay (s/veh)			12.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			54.8%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

# HCM 6th Signalized Intersection Summary

## 2: NE 72nd Avenue & NE 63rd Street

11/12/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	415	58	27	367	20	85	99	27	29	103	87
Future Volume (veh/h)	94	415	58	27	367	20	85	99	27	29	103	87
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		1.00	1.00		0.97
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	1870	1870	1870	1870	1870	1870	1856	1856	1856
Adj Flow Rate, veh/h	94	415	36	27	367	17	85	99	10	29	103	25
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	1	1	1	2	2	2	2	2	2	3	3	3
Cap, veh/h	685	1122	927	625	991	46	259	292	29	276	250	61
Arrive On Green	0.07	0.60	0.60	0.03	0.56	0.56	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1795	1885	1557	1781	1771	82	1257	1671	169	1271	1433	348
Grp Volume(v), veh/h	94	415	36	27	0	384	85	0	109	29	0	128
Grp Sat Flow(s),veh/h/ln	1795	1885	1557	1781	0	1853	1257	0	1839	1271	0	1781
Q Serve(g_s), s	1.2	6.9	0.6	0.4	0.0	6.9	3.9	0.0	3.1	1.2	0.0	3.8
Cycle Q Clear(g_c), s	1.2	6.9	0.6	0.4	0.0	6.9	7.7	0.0	3.1	4.3	0.0	3.8
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.09	1.00		0.20
Lane Grp Cap(c), veh/h	685	1122	927	625	0	1037	259	0	321	276	0	311
V/C Ratio(X)	0.14	0.37	0.04	0.04	0.00	0.37	0.33	0.00	0.34	0.11	0.00	0.41
Avail Cap(c_a), veh/h	734	1122	927	734	0	1037	427	0	567	446	0	549
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)	0.52	0.52	0.52	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	4.8	6.3	5.0	5.3	0.0	7.3	25.5	0.0	21.7	23.6	0.0	22.0
Incr Delay (d2), s/veh	0.0	0.5	0.0	0.0	0.0	0.2	0.7	0.0	0.6	0.2	0.0	0.9
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	0.3	2.1	0.1	0.1	0.0	2.1	1.1	0.0	1.3	0.4	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	4.9	6.8	5.1	5.3	0.0	7.6	26.2	0.0	22.4	23.8	0.0	22.9
LnGrp LOS	A	A	A	A		A	C		C	C		C
Approach Vol, veh/h		545			411			194				157
Approach Delay, s/veh		6.3			7.4			24.0				23.1
Approach LOS		A			A			C				C
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	39.7		14.5	8.0	37.6		14.5				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	5.5	24.0		18.5	5.6	23.9		18.5				
Max Q Clear Time (g_c+I1), s	2.4	8.9		9.7	3.2	8.9		6.3				
Green Ext Time (p_c), s	0.0	2.3		0.5	0.0	1.9		0.5				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay, s/veh				11.3								
HCM 6th LOS				B								

HCM 6th TWSC  
3: NE 81st Avenue & NE 63rd Street

11/12/2023

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↶	↷		↶	↷			↕			↕	
Traffic Vol, veh/h	66	335	34	19	302	37	52	4	10	23	3	39
Future Vol, veh/h	66	335	34	19	302	37	52	4	10	23	3	39
Conflicting Peds, #/hr	3	0	1	1	0	3	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	100	100	100	100	100	100	100	100	100	100	100	100
Heavy Vehicles, %	1	1	1	2	2	2	4	4	4	2	2	2
Mvmt Flow	66	335	34	19	302	37	52	4	10	23	3	39

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	342	0	0	370	0	0	865	865	353	853	864	324
Stage 1	-	-	-	-	-	-	485	485	-	362	362	-
Stage 2	-	-	-	-	-	-	380	380	-	491	502	-
Critical Hdwy	4.11	-	-	4.12	-	-	7.14	6.54	6.24	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.12	5.52	-
Follow-up Hdwy	2.209	-	-	2.218	-	-	3.536	4.036	3.336	3.518	4.018	3.318
Pot Cap-1 Maneuver	1223	-	-	1189	-	-	272	289	686	279	292	717
Stage 1	-	-	-	-	-	-	560	548	-	657	625	-
Stage 2	-	-	-	-	-	-	638	610	-	559	542	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1220	-	-	1188	-	-	241	268	685	257	271	715
Mov Cap-2 Maneuver	-	-	-	-	-	-	241	268	-	257	271	-
Stage 1	-	-	-	-	-	-	529	518	-	620	613	-
Stage 2	-	-	-	-	-	-	591	598	-	517	512	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s/v	1.2			0.4			22.7			15.2		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	269	1220	-	-	1188	-	-	419
HCM Lane V/C Ratio	0.245	0.054	-	-	0.016	-	-	0.155
HCM Control Delay (s/veh)	22.7	8.1	-	-	8.1	-	-	15.2
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q (veh)	0.9	0.2	-	-	0	-	-	0.5



HCM 6th TWSC  
4: NE 58th Street & NE 81st Avenue

11/12/2023

Intersection						
Int Delay, s/veh	2.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Vol, veh/h	9	90	97	80	69	9
Future Vol, veh/h	9	90	97	80	69	9
Conflicting Peds, #/hr	1	0	0	1	1	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	92	92	92	92	92	92
Heavy Vehicles, %	1	1	3	3	2	2
Mvmt Flow	10	98	105	87	75	10

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	193	0	-	0	269
Stage 1	-	-	-	-	150
Stage 2	-	-	-	-	119
Critical Hdwy	4.11	-	-	-	6.42
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	2.209	-	-	-	3.518
Pot Cap-1 Maneuver	1386	-	-	-	720
Stage 1	-	-	-	-	878
Stage 2	-	-	-	-	906
Platoon blocked, %		-	-	-	
Mov Cap-1 Maneuver	1385	-	-	-	713
Mov Cap-2 Maneuver	-	-	-	-	713
Stage 1	-	-	-	-	870
Stage 2	-	-	-	-	905

Approach	EB	WB	SB
HCM Control Delay, s/v	0.7	0	10.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1385	-	-	-	730
HCM Lane V/C Ratio	0.007	-	-	-	0.116
HCM Control Delay (s/veh)	7.6	0	-	-	10.6
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q (veh)	0	-	-	-	0.4

HCM 6th TWSC  
5: NE 82nd Avenue & NE 58th Street

11/12/2023

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	0	19	125	92	18	0	160	5	134	0	3	0
Future Vol, veh/h	0	19	125	92	18	0	160	5	134	0	3	0
Conflicting Peds, #/hr	3	0	2	2	0	3	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	1	1	1	33	33	33
Mvmt Flow	0	21	136	100	20	0	174	5	146	0	3	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	23	0	0	159	0	0	313	314	91	388	382	23
Stage 1	-	-	-	-	-	-	91	91	-	223	223	-
Stage 2	-	-	-	-	-	-	222	223	-	165	159	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.11	6.51	6.21	7.43	6.83	6.53
Critical Hdwy Stg 1	-	-	-	-	-	-	6.11	5.51	-	6.43	5.83	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.11	5.51	-	6.43	5.83	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.509	4.009	3.309	3.797	4.297	3.597
Pot Cap-1 Maneuver	1579	-	-	1408	-	-	642	603	969	519	505	971
Stage 1	-	-	-	-	-	-	919	821	-	714	665	-
Stage 2	-	-	-	-	-	-	783	721	-	769	711	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1574	-	-	1405	-	-	602	557	967	412	466	968
Mov Cap-2 Maneuver	-	-	-	-	-	-	602	557	-	412	466	-
Stage 1	-	-	-	-	-	-	917	819	-	712	615	-
Stage 2	-	-	-	-	-	-	723	667	-	649	710	-

Approach	EB	WB	NB	SB
HCM Control Delay, s/v	0	6.5	14	12.8
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	723	1574	-	-	1405	-	-	466
HCM Lane V/C Ratio	0.45	-	-	-	0.071	-	-	0.007
HCM Control Delay (s/veh)	14	0	-	-	7.8	0	-	12.8
HCM Lane LOS	B	A	-	-	A	A	-	B
HCM 95th %tile Q (veh)	2.3	0	-	-	0.2	-	-	0