

TRANSPORTATION TECHNICAL REPORT

for

Pope Elementary School Remodel / Expansion

PREPARED FOR:

Puyallup School District

PREPARED BY:


6544 NE 61st Street, Seattle, WA 98115
ph: (206) 523-3939 ♦ fx: (206) 523-4949



June 12, 2018

TABLE OF CONTENTS

1. INTRODUCTION	1
1.1. Project Identification.....	1
2. EXISTING CONDITIONS.....	5
2.1. Roadway Network.....	5
2.2. Traffic Volumes	5
2.3. Traffic Operations	8
2.4. Parking	9
2.5. Transit Facilities and Service	9
2.6. Non-Motorized Transportation Facilities.....	9
3. FUTURE BASELINE CONDITIONS	10
3.1. Planned Transportation Projects in Site Vicinity	10
3.2. Forecast 2023 Background Traffic Volumes	10
3.3. Traffic Operations	13
4. FUTURE WITH PROJECT CONDITIONS	14
4.1. Roadway Network.....	14
4.2. Traffic Volumes	14
4.3. Traffic Operations	19
4.4. Site Access Spacing & Sight Distance.....	23
4.5. Transit Facilities & Service.....	27
4.6. Non-Motorized Transportation Facilities.....	28
4.7. Parking	28
5. MITIGATION	29
5.1. Physical Improvements	29
5.2. Operational Recommendations	29

APPENDIX A – Traffic Count Data Sheets

APPENDIX B – Level of Service Definitions

APPENDIX C – Level of Service Calculation Sheets

APPENDIX D – Turn Lane Storage Charts

APPENDIX E – Simulation Model Results



LIST OF FIGURES

Figure 1. Site Vicinity Map.....	2
Figure 2. Proposed Site Plan	4
Figure 3. Existing (2017) Traffic Volumes – Morning and Afternoon Peak Hours.....	6
Figure 4. Existing (2017) Traffic Volumes – PM Peak Hour	7
Figure 5. Forecast 2023 Without-Project Traffic Volumes – Morning and Afternoon Peak Hours	11
Figure 6. Forecast 2023 Without-Project Traffic Volumes – PM Peak Hour	12
Figure 7. Pope Elementary Enrollment Area	16
Figure 8. Trip Distribution & Assignment – Morning and Afternoon Peak Hours.....	17
Figure 9. Trip Distribution & Assignment – PM Peak Hour.....	18
Figure 10. Forecast 2023 With-Project Traffic Volumes – Morning and Afternoon Peak Hours	20
Figure 11. Forecast 2023 With-Project Traffic Volumes – PM Peak Hour	21
Figure 12. Entering Sight Distance – Access Driveway on 122 nd Avenue E	25
Figure 13. Sight Distance – Eastern Access Driveway on 152 nd Street E.....	26
Figure 14. Sight Distance – Western (service) Access Driveway on 152 nd Street E.....	27

LIST OF TABLES

Table 1. Level of Service – Existing (2017) Conditions	8
Table 2. Level of Service – Background Off-Site Conditions	13
Table 3. Trip Generation Rates – Pope Elementary School	15
Table 4. Trip Generation Estimates – Pope Elementary School Remodel / Expansion	15
Table 5. Left-Turn Lane Analysis Summary.....	22
Table 6. Level of Service – Future (2023) With-Project.....	23

1. INTRODUCTION

This report presents the transportation impact analysis for the proposed remodel and expansion of Pope Elementary School in the Puyallup area of unincorporated Pierce County, Washington. This report includes a description of existing and proposed conditions in the site vicinity, projected trip generation and distribution patterns, operational analysis at nearby intersections and the site access driveways.

The study area, analysis approach, and assumptions were coordinated with the Pierce County (County) Traffic Section¹ after submittal of *Transportation Analysis Scoping* information and a scoping meeting.²

1.1. Project Identification

1.1.1. Existing School

The Puyallup School District is the applicant proposing to remodel and expand Pope Elementary School, which is located at 15102-122nd Avenue E, Puyallup, WA 98374, in unincorporated Pierce County. The project would replace portable classrooms with permanent building space and provide enrollment capacity of 730 students—an increase of 22 students compared to its existing capacity with the portables.

The Puyallup School District retained Heffron Transportation, Inc. to prepare the required traffic and transportation analyses for the project. Heffron Transportation, Inc. is a professional traffic and transportation engineering consulting firm located and registered in the State of Washington. The analysis and report documentation were prepared by:

Tod S. McBryan, P.E., Principal & Vice President
Heffron Transportation, Inc.
6544 NE 61st Street
Seattle, WA 98115

Phone: (206) 527-8410
Fax: (206) 527-3108
Email: tod@hefftrans.com

Mr. McBryan is a Principal Transportation Engineer and Professional Civil Engineer licensed in the State of Washington with over 26 years of experience preparing traffic impact analyses. He is also a member of the Institute of Transportation Engineers (ITE) and the Transportation Research Board (TRB).

Pope Elementary School serves kindergarten through sixth grade (K-6) and consists of one main school building (totaling 56,640 square feet (sf)) and nine portable classroom buildings (with 7,680 sf).³ The enrollment capacity of the existing school is 708 students (492 in permanent building capacity and 216 in the nine portable classrooms⁴); the current (fall 2017) enrollment is 573 students.⁵

The school site has a play field located north of the buildings and on-site parking that occurs in a main lot east of the school building. The main parking lot has 69 striped spaces with two access driveways—one on 122nd Avenue E (450 feet north of 152nd Street, measured centerline-to-centerline) and one on 152nd Street E opposite 121st Avenue Court E (190 feet west of 122nd Avenue E). There is a small paved service area located south of the main building that is unstriped (signs indicate no drop-off and that parking reserved for school staff). It is occasionally used by staff for parking (three to six cars) and is accessed from 152nd Street E. School-bus load/unload occurs along the east side of 120th Avenue Court E on the west side of the school building. The site location and vicinity are shown on Figure 1.

¹ *Pope Elementary Remodel Scoping Request Memorandum*, B Churchill, P.E., Assoc. County Traffic Engr., Feb. 8, 2018.

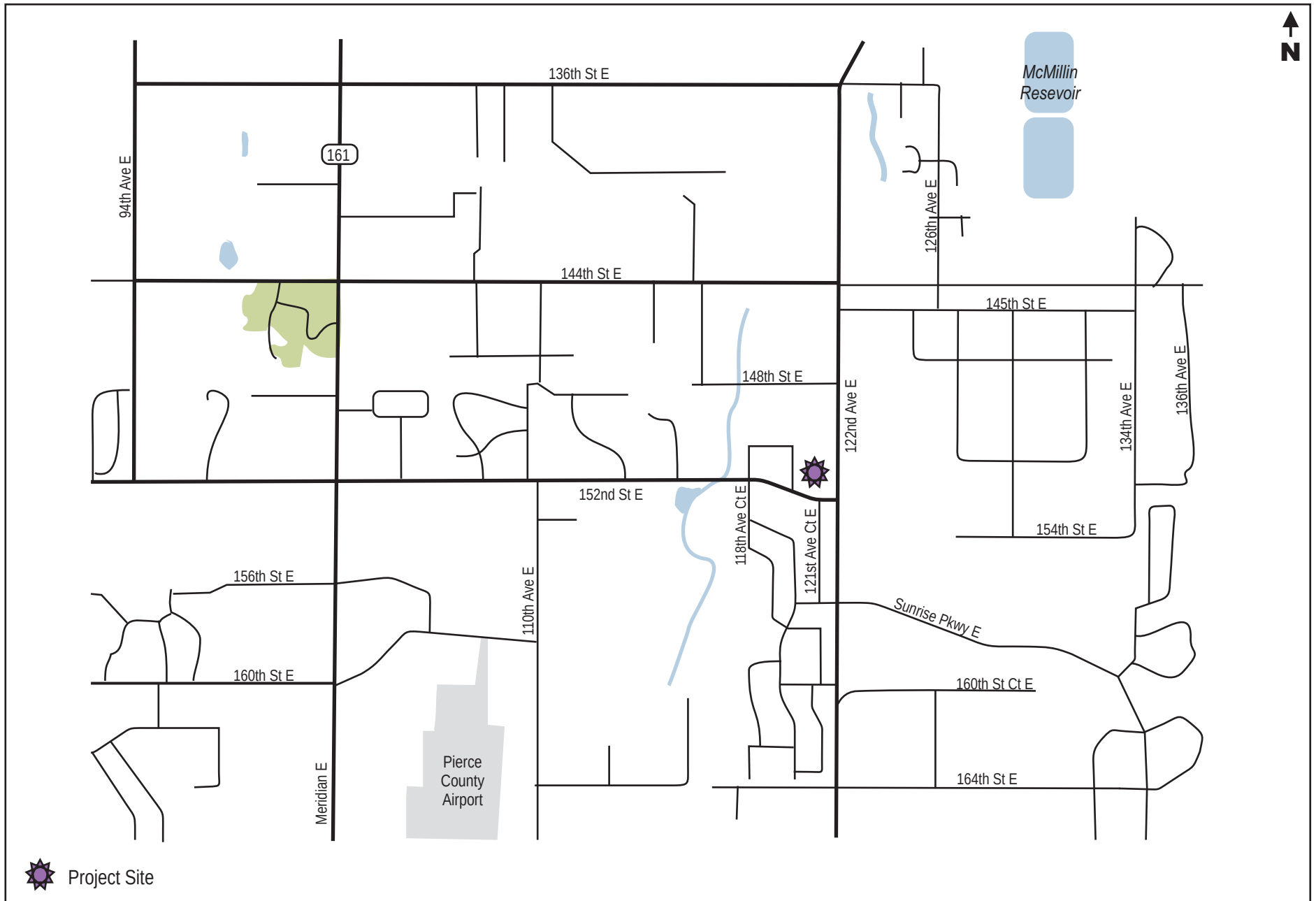
² Meeting held at Pierce County, January 25, 2018.

³ Building areas from Pierce County Assessor Website, Accessed, February 2018.

⁴ Puyallup School District, *2017-2022 Capital Facilities Plan*, October 16, 2017.

⁵ Email communication, M. Meadows – Director Construction Management, Puyallup School District, Nov. 30, 2017.





POPE ELEMENTARY SCHOOL Remodel and Expansion

Figure 1
Site Vicinity

1.1.2. Proposed Remodel / Expansion Project

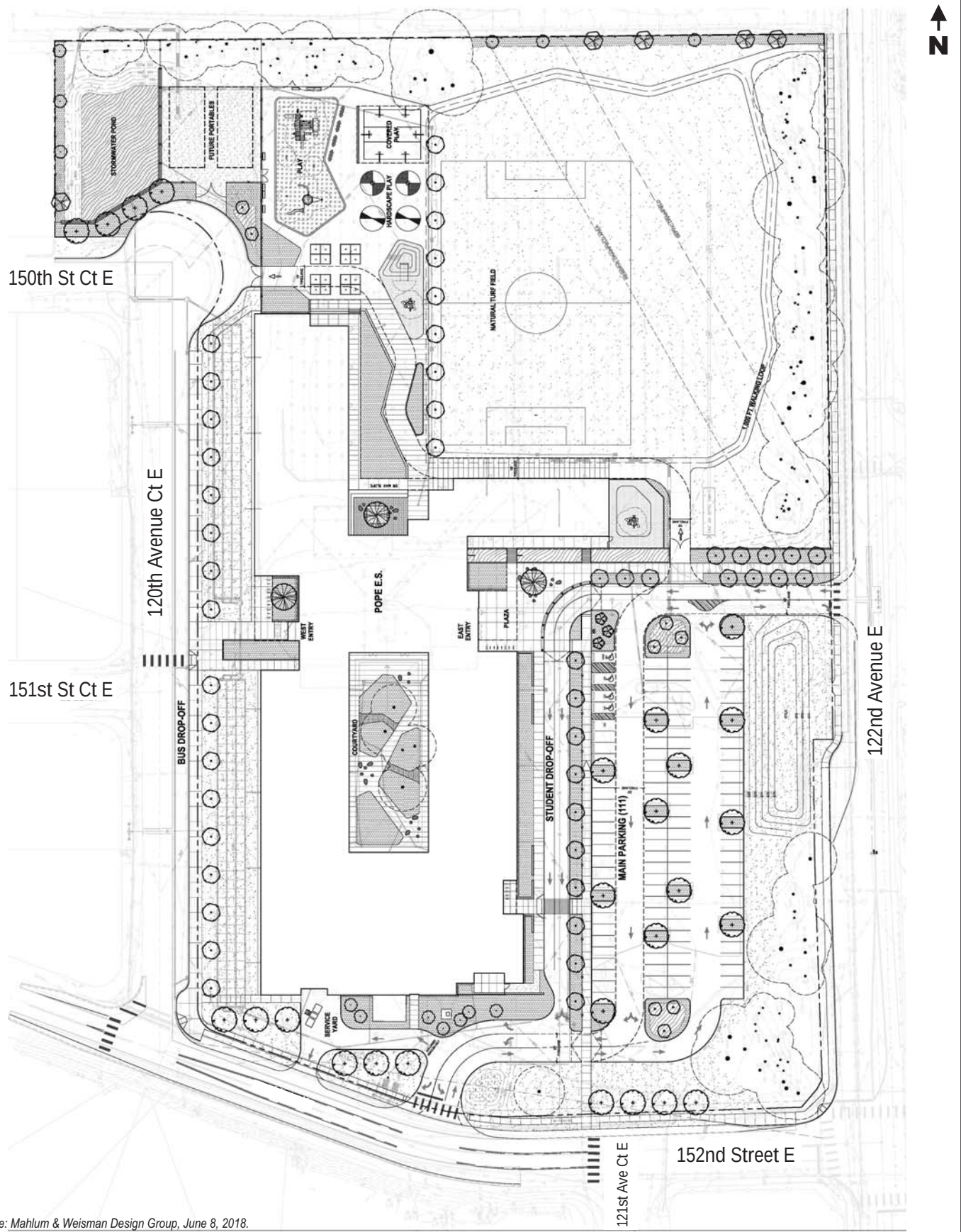
The Puyallup School District proposes to remodel and expand the school to provide for an enrollment capacity of 730 students—an increase of 22 students compared to current enrollment capacity. The project would also reconfigure site access, reconfigure on-site vehicle queuing/stacking capacity, and increase parking supply. The driveway on 152nd Street E that serves the main parking lot would be relocated westward approximately 160 feet (centerline-to-centerline); it would maintain minimum spacing between the driveway and 121st Avenue Court E of 125 feet, as measured from the intersecting road right-of-way line to the nearest edge of the access. The existing service area access driveway on 152nd Street E would be retained in its current location but would be reconfigured as an outbound-only access with an internal entry provided from the main parking lot. The driveway on 122nd Avenue E that serves the main parking lot would be retained in its current location but would be reconfigured to restrict access to right-in/right-out movements only. School-bus load/unload is planned to remain along the east side of 120th Avenue Court E, where an enhanced load zone would be developed with a new curb and sidewalk with a curb-side pullout.

The main school parking lot would be reconfigured and expanded to provide 111 parking spaces and enhanced passenger car load/unload zone. The school-bus and passenger-vehicle load/unload zones may also be available for parking during non-school hours (such as for evening or weekend events) providing capacity for about 40 additional vehicles, for a total capacity of 151 vehicles. The proposed site plan is shown on Figure 2.

The remodel and expansion project is planned to be complete by fall 2020; students and staff would be temporarily relocated to the existing Firgrove building during the 2019-20 school year.

1.1.3. Analysis Study Area

Based on scoping guidance provided by the County, the study area for this analysis consists of existing and proposed site access driveways as well as nearby off-site intersections along 152nd Street E—at 122nd Avenue E, 121st Avenue Court E, 120th Avenue Court E, and 118th Avenue Court E.



Source: Mahlum & Weisman Design Group, June 8, 2018.

POPE ELEMENTARY SCHOOL Remodel and Expansion

Figure 2
Site Plan

2. EXISTING CONDITIONS

This section describes the existing roadway network, traffic volumes, traffic operations (in terms of levels of service), transit facilities, non-motorized facilities, and parking.

2.1. Roadway Network

The County has four primary roadway classifications—Major Arterials, Secondary Arterials, Collector Arterials, and Local Roads depending upon the street’s function in the roadway network.⁶ The key roadways in the vicinity of the project site are described below.

122nd Avenue E is a north-south Secondary Arterial between 136th and 200th Streets E and is aligned along eastern edge of the school site. Near the school site, it has one travel lane in each direction and widens to provide turn pockets at the intersection with 152nd Street E. It generally has paved shoulders on both sides; however, just north and south of the 152nd Street intersection there is curb and sidewalk along the west side (extending about 440 feet south and about 280 feet north). The roadway has a posted speed limit of 35 miles per hour (mph); near the school, there is a 20-mph school zone speed limit in effect when children are present. Its intersection with 152nd Street E is signalized with crosswalks and push-button pedestrian-actuated crossing signals on all three legs.

152nd Street E is an east-west Secondary Arterial between 94th and 122nd Avenues E and is aligned along southern edge of the school site. Near the school site, it has one travel lane in each direction and widens to provide turn pockets at the intersection with 122nd Avenue E. It generally has shoulders consisting of a narrow, paved portion and wider gravel portion. The roadway has a posted speed limit of 35 mph; near the school, there is a 20-mph school zone speed limit in effect when children are present.

120th Avenue Court E is a north-south Local Road that extends for two blocks to the north of 152nd Street E and aligns along the western edge of the school site. It has one lane in each direction with a rolled asphalt curb along the west side and a wide asphalt paved shoulder along the east side. The wide east shoulder is used for school-bus load/unload and has a striped pedestrian walkway in the load area.

121st Avenue Court E and **118th Avenue Court E** are Local Roads that provide access to residential properties north and south of 152nd Street E.

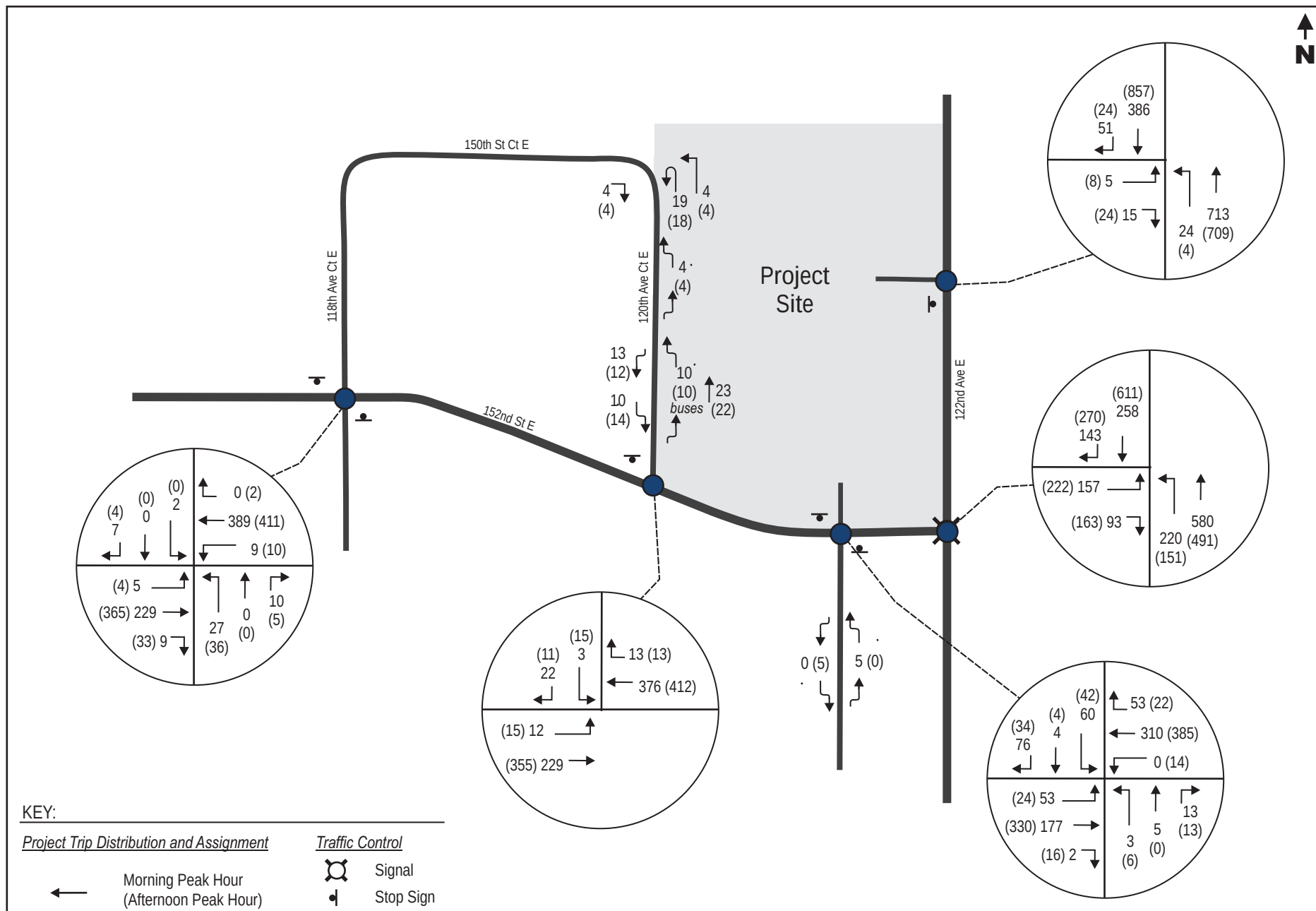
2.2. Traffic Volumes

Classes at Pope Elementary School start at 8:55 A.M. and are dismissed at 3:16 P.M. Video vehicle turning movement counts were performed at the study area intersections and site driveways on Tuesday, October 24, 2017. Morning counts were performed from 7:00 to 9:30 A.M.; afternoon counts were performed from 2:30 to 6:00 P.M. In addition, 72-hour machine counts were performed at the site driveways from October 24 through 26, 2017, to document existing daily trip generation at the site.

The traffic count data were compiled to determine the existing morning arrival and afternoon dismissal peak hour traffic volumes for the school. Based on the counts, the school’s morning peak hour occurs from 8:00 to 9:00 A.M.; the afternoon peak hour occurs from 2:45 to 3:45 P.M.; and the commuter PM peak hour of the adjacent streets occurs from 4:45 to 5:45 P.M. The existing 2017 morning arrival and afternoon dismissal peak hour traffic volumes are shown on Figure 3; the existing PM peak hour traffic volumes are shown on Figure 4. The count data sheets are provided in Appendix A.

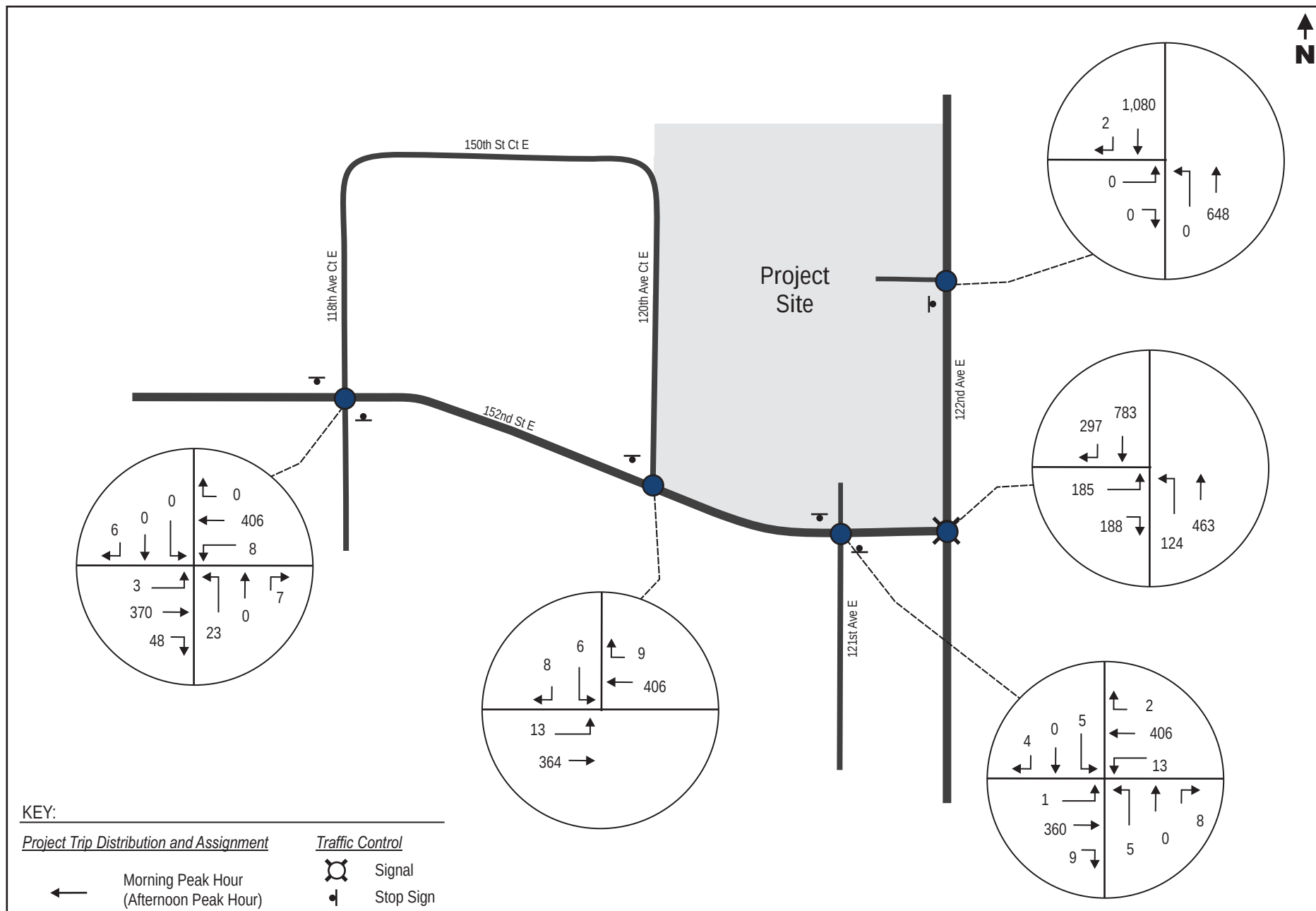
⁶ Pierce County website (www.co.pierce.wa.us/2731/Arterial-Classifications), Exhibit “A” of Ordinance No. 2015-23, last updated 2017, accessed February 2018.





POPE ELEMENTARY SCHOOL Remodel and Expansion

Figure 3
Existing (2017) Traffic Volumes
Morning and Afternoon Peak Hours



POPE ELEMENTARY SCHOOL Remodel and Expansion

Figure 4
Existing (2017) Traffic Volumes
PM Peak Hour

2.3. Traffic Operations

Traffic operations analyses were performed for the study area intersections. Traffic operations are evaluated using levels of service (LOS) with six letter designations, “A” through “F.” LOS A is the best and represents the best traffic operation with little or no delay to motorists. LOS F is the worst and indicates poor traffic operations with long delays. The level of service definitions and thresholds are provided in Appendix B.

Levels of service for the study area intersections were determined using the methodology in the *Highway Capacity Manual, 6th Edition*.⁷ Delay calculations rely on complex equations that consider a number of variables. For example, delay at signalized intersections is determined based on a complex combination of variables including traffic volume by intersection movement, lane configuration, signal phasing and timing, and number of pedestrian crossings. Delay at unsignalized intersections is determined for vehicles that must stop or yield for oncoming traffic. That delay is related to the availability of gaps in the main street's traffic flow and the ability of a driver to enter or pass through those gaps. All level-of-service calculations were performed using the *Synchro 10.1* traffic operations analysis software. The software models reflect current intersection geometries and levels of service were reported using the *HCM 6* module for all intersections. Signal timing information was provided by Pierce County and field verified. Table 1 summarizes levels of service for existing (2017) morning arrival, afternoon dismissal, and PM peak hours at the site access intersections.

Table 1. Level of Service – Existing (2017) Conditions

Control Type / Intersection	Morning Peak Hour (8:00 to 9:00 A.M.)		Afternoon Peak Hour (2:45 to 3:45 P.M.)		PM Peak Hour (4:45 to 5:45 P.M.)	
	LOS ^a	Delay ^b	LOS	Delay	LOS	Delay
Signalized						
152 nd St E / 122 nd Ave E ^c	A	7.5	B	10.2	B	10.8
Unsignalized						
152 nd St E / 121 st Ave Ct E / Dwy (overall)	A	5.9	A	5.3	A	0.9
Northbound movement	C	15.6	C	17.0	B	14.0
Southbound movements	C	22.1	D	27.9	C	15.8
Eastbound left turns	A	8.7	A	8.2	A	8.2
Westbound left turns	A	0.0	A	8.2	A	8.1
152 nd St E / 120 th Ave Ct E (overall)	A	1.1	A	1.2	A	0.5
Southbound movements	C	16.0	C	19.4	B	13.7
Eastbound left turns	A	9.5	A	9.1	A	8.3
152 nd St E / 118 th Ave Ct E (overall)	A	1.3	A	1.7	A	1.3
Northbound movement	C	21.6	D	25.4	C	19.7
Southbound movements	C	15.4	B	11.3	B	11.2
122 nd Ave E / School Dwy (overall)	A	0.9	A	1.7	A	0.0
Northbound left	A	8.5	B	10.1	A	0.0
Eastbound movements	C	18.1	E	36.8	A	0.0

Source: Heffron Transportation, Inc., February 2018.

a. Level of service.

b. Average seconds of delay per vehicle.

c. Eastbound left-turn phase analyzed as a protected to allow application of HCM 6 methodology, which requires NEMA compliant signal phasing. No pedestrian crossings of the north leg were observed during the analysis periods.

⁷ Transportation Research Board 2016.



As shown, the signalized 152nd Street E / 122nd Avenue E intersection currently operates at LOS B or better during all three analysis periods. The four unsignalized study-area intersections currently operate at LOS A overall during all three peak hours. However, southbound movements from the school's main driveway on 152nd Street E and northbound movements from 118th Avenue Court E onto 152nd Street E operate at LOS D during the afternoon peak hour. Eastbound turns from the school driveway on 122nd Avenue E operate at LOS E. All other movements operate at LOS C or better during all hours. The level-of-service calculation sheets are included in Appendix C.

2.4. Parking

As described previously, the existing school has on-site parking with a total of 69 striped spaces in the main parking lot, and a service area that is used by a few staff for parking. School-day parking demand at elementary schools is primarily driven by staffing levels and family-volunteer activity. Field counts of on-site parking demand were conducted on Thursday, November 30, 2017, at 9:10 A.M. and 1:40 P.M. and again on Tuesday, April 3, 2018, between 10:00 and 11:00 A.M. The first count found 73 parked vehicles (55 in the main parking lot, 2 in the service area, and 16 along 120th Avenue Court E); however, based on the observations, it is likely that about 13 of the cars parked along 120th Avenue Court E were family members still inside the building after dropping off students. The second count found 58 vehicles (51 in the main lot, 4 in the service area, and 3 along 120th Avenue Court E). The third count found 64 vehicles (61 in the main lot, 3 in the service area). Based on the current school staffing level (55 employees⁸), the school generates between about 1.05 and 1.33 parked vehicles per employee with an average rate of 1.18 vehicles per employee. This rate is consistent with rates for elementary schools, including others in the Puyallup School District, observed by Heffron Transportation at numerous locations throughout western Washington. ITE's *Parking Generation*⁹ does not include data for elementary schools based on staffing levels (the data provided are based on enrollment levels and are unclear if they reflect conditions during morning arrival, afternoon dismissal, or special events). *Parking Generation* does include an employee-based rate for middle schools of 1.22-vehicles-per-employee, which is also in the range of observations conducted by Heffron Transportation.

2.5. Transit Facilities and Service

The site is not directly served with transit stops; however, Pierce Transit provides bus service within the larger Pierce County and City of Puyallup. The closest transit stops are located over 1.3 miles to the west on Meridian Avenue E (State Route [SR] 161). Stops serving northbound and southbound buses are located at the 152nd Street E intersection and are served by Pierce Transit's Route 402 that connects to Federal Way via South Hill Mall, Puyallup, and Edgewood.

2.6. Non-Motorized Transportation Facilities

As described in the *Roadway Network* section, there are very limited non-motorized facilities in the site vicinity. There are segments of curb and sidewalk along the west side of 122nd Avenue E, to the north and south of the 152nd Street E intersection (extending about 440 south and about 280 feet north). There are marked crosswalks with pedestrian signals at the signalized 122nd Avenue E / 152nd Street E intersection. There are also marked crosswalks at four unsignalized intersections near the site: 152nd Street E / 120th Avenue Courts E (across the west and north legs), 152nd Street E / 121st Avenue Courts E (across the west leg), 122nd Avenue E / 151st Street E (across the south leg), and 120th Avenue Court E / 151st Street Court E (across the north leg).

⁸ M. Meadows, Puyallup School District, November 2017 and staff directory.

⁹ ITE, 4th Edition, 2010.



3. FUTURE BASELINE CONDITIONS

This section of the report presents future transportation conditions without the proposed project. As noted previously, the proposed Pope Elementary School Remodel / Expansion project is planned to be complete by fall 2020. However, Pierce County requires the transportation analysis horizon year to be five years from the date of the traffic study. Therefore, year 2023 was selected as the horizon year. For comparison, and to provide an analysis of potential new traffic and parking impacts, year 2023 without-project conditions assume the existing Pope Elementary School would operate at its existing enrollment capacity 708 students. The following sections describe planned improvements, traffic volumes, and traffic operations (in terms of levels of service).

3.1. Planned Transportation Projects in Site Vicinity

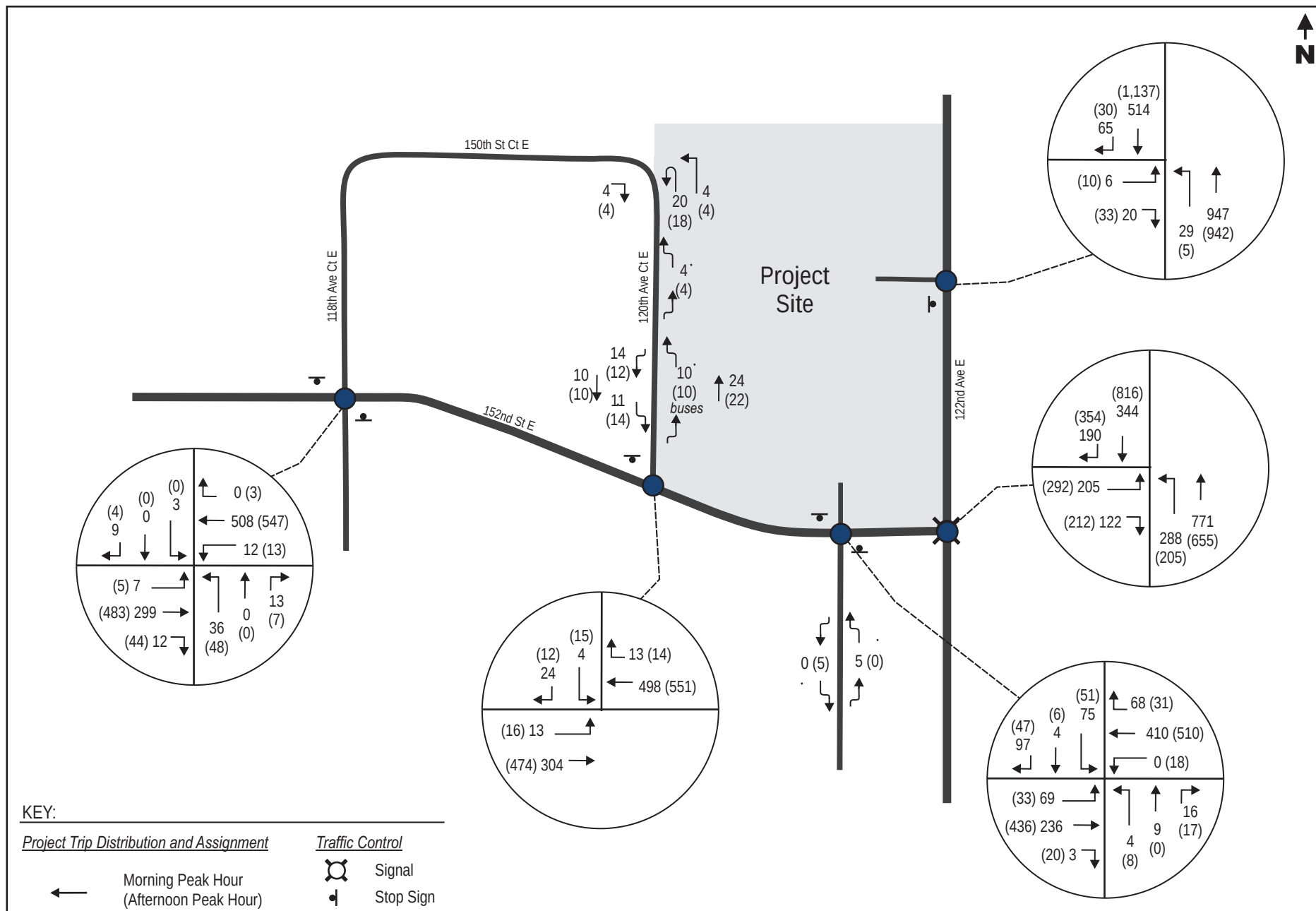
Pierce County's *2018-2023 Six-Year Transportation Improvement Program (TIP)*¹⁰ was reviewed to determine if there are any planned transportation improvements that would affect the study area roadways or intersections. No projects were identified that would change the existing roadway operations or capacity. Therefore, the existing geometries and traffic control were assumed to be in place for future-conditions analyses that are described in the following sections.

3.2. Forecast 2023 Background Traffic Volumes

Traffic forecasts were developed for future 2023 without-project conditions based on guidance provided by the County Associate Traffic Engineer during analysis scoping. Historic traffic count data were evaluated to determine growth in the project vicinity within the past four to five years. Average annual daily traffic (AADT) counts published by Pierce County for 122nd Avenue E (north of 152nd Street E) and 152nd Street E (west of 121st Avenue Court E) were reviewed. The data indicate that combined traffic volumes on both roadways increased by 5.5% annually between 2012 and 2016. Therefore, as directed by County staff, a 5.5% compound annual growth rate was applied to the existing 2017 non-school traffic volumes at the study-area intersections to reflect 2023 without-project traffic estimates for each analysis period. The resulting 2023 "without project" volumes during morning arrival and afternoon dismissal peak hours are shown on Figure 5; the 2023 "without project" volumes during the PM peak hour are shown on Figure 6.

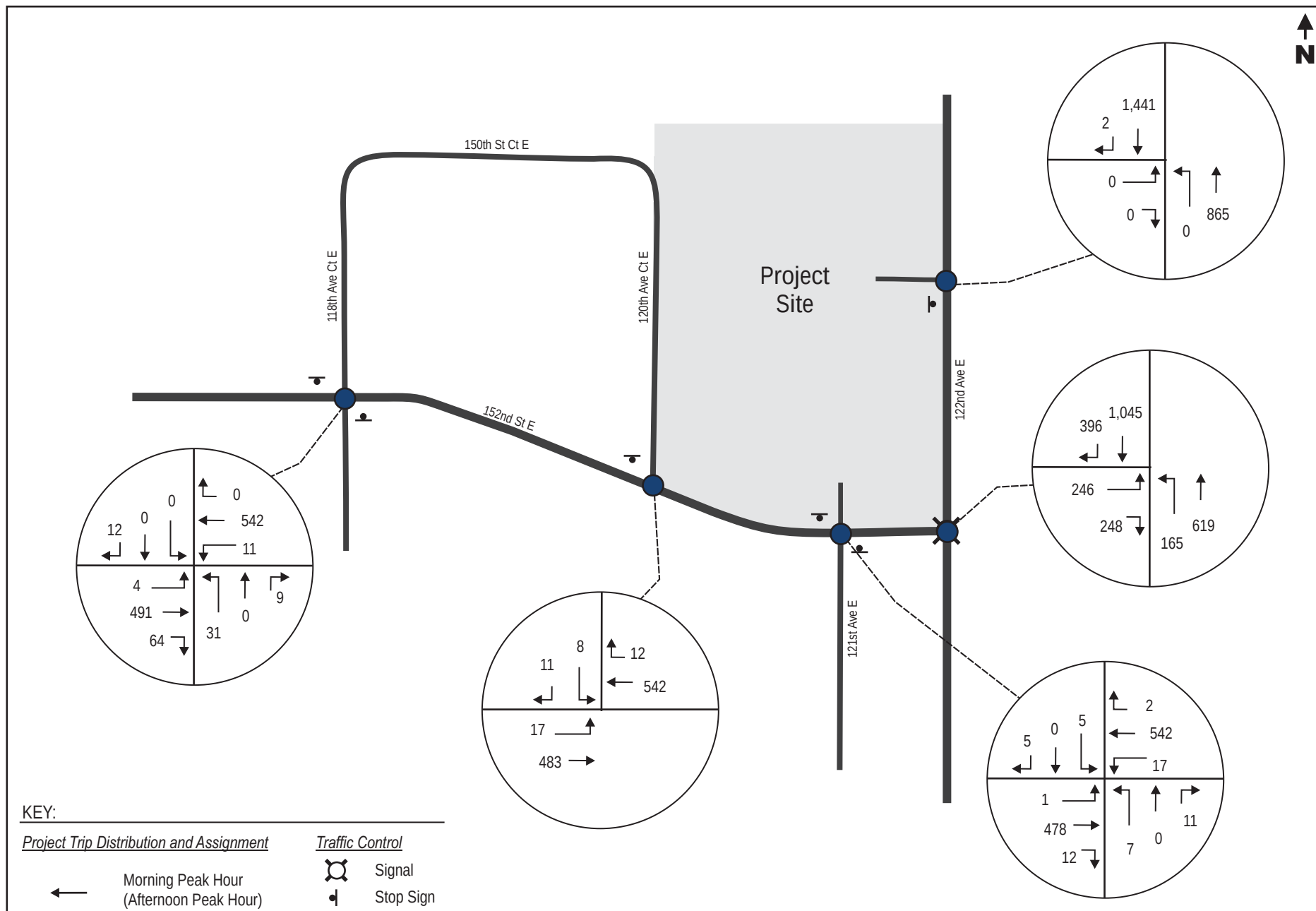
¹⁰ Exhibit "A" to Ordinance No. 2017-63s, Effective November 25, 2017.





POPE ELEMENTARY SCHOOL Remodel and Expansion

Figure 5
Forecast 2023 Without-Project Traffic Volumes
Morning and Afternoon Peak Hours



POPE ELEMENTARY SCHOOL Remodel and Expansion

Figure 6
Forecast 2023 Without-Project Traffic Volumes
PM Peak Hour

3.3. Traffic Operations

Levels of service for study area intersections were calculated for the 2023-without-project background conditions using the methodology described previously. Table 2 shows the results of the level of service analysis; results for the 2017 existing conditions are included for comparison.

As shown, the assumed increases in background traffic (5.5% compound annual growth) along both 122nd Avenue E and 152nd Street E is forecast to result in increased delays at the study area intersections during all three analysis periods. The signalized 152nd Street E / 122nd Avenue E intersection is expected to remain operating at LOS C or better during all periods. However, the increases are projected to degrade movements from the school access driveway on 152nd Street E to LOS F during the morning and afternoon peak hours; growth in background traffic on 122nd Avenue E is projected to degrade turns from the school access to LOS F in the afternoon with severe delays. Similarly, the assumed growth in background traffic on 152nd Street E is projected to degrade the northbound movements from 118th Avenue Court E to LOS E in the morning and to LOS F in the afternoon. The other movements at study area intersections are projected to operate at LOS D or better in 2023 without the project. The level-of-service calculation sheets are provided in Appendix C.

Table 2. Level of Service – Background Off-Site Conditions

Control Type / Intersection	Morning Peak Hour (8:00 to 9:00 A.M.)				Afternoon Peak Hour (2:45 to 3:45 P.M.)				PM Peak Hour (4:45 to 5:45 P.M.)			
	Existing		2023 w/o- Project		Existing		2023 w/o- Project		Existing		2023 w/o- Project	
	LOS ^a	Delay ^b	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Signalized												
152 nd St E / 122 nd Ave E ^c	A	7.5	A	9.7	B	10.2	B	16.8	B	10.8	C	26.0
Unsignalized												
152 nd St E / 121 st Ave Ct E (overall)	A	5.9	C	15.3	A	5.3	C	19.2	A	0.9	A	1.1
Northbound movement	C	15.6	D	26.4	C	17.0	D	29.1	B	14.0	C	18.6
Southbound movements	C	22.1	F	65.2	D	27.9	F	113.4	C	15.8	C	21.0
Eastbound left turns	A	8.7	A	9.4	A	8.2	A	8.7	A	8.2	A	8.6
Westbound left turns	A	0.0	A	0.0	A	8.2	A	8.5	A	8.1	A	8.5
152 nd St E / 120 th Ave Ct E (overall)	A	1.1	A	1.2	A	1.2	A	1.3	A	0.5	A	0.7
Southbound movements	C	16.0	C	21.6	C	19.4	D	28.6	B	13.7	B	17.6
Eastbound left turns	A	9.5	B	10.3	A	9.1	A	9.8	A	8.3	A	8.7
152 nd St E / 118 th Ave Ct E (overall)	A	1.3	A	2.2	A	1.7	A	3.5	A	1.3	A	2.1
Northbound movement	C	21.6	E	39.5	D	25.4	F	56.0	C	19.7	D	34.8
Southbound movements	C	15.4	C	21.7	B	11.3	B	12.9	B	11.2	B	12.7
122 nd Ave E / School Dwy (overall)	A	0.9	A	1.5	A	1.7	A	8.1	A	0.0	A	0.0
Northbound left	A	8.5	A	9.0	B	10.1	B	11.7	A	0.0	A	0.0
Eastbound movements	C	18.1	D	32.3	E	36.8	F	178.3	A	0.0	A	0.0

Source: Heffron Transportation, Inc., February 2018.

a. Level of service.

b. Average seconds of delay per vehicle.

c. Eastbound left-turn phase analyzed as a protected to allow application of HCM 6 methodology, which requires NEMA compliant signal phasing. No pedestrian crossings of the north leg were observed during the analysis periods.

4. FUTURE WITH PROJECT CONDITIONS

This section describes the conditions that would exist with the proposed remodeled and expanded Pope Elementary School at its planned enrollment capacity of 730 students. Potential impacts to study-area traffic operations, site access, queuing, transit, non-motorized facilities, and parking were evaluated.

4.1. Roadway Network

The school is proposed to retain two access driveways to the main parking and passenger-vehicle load/unload area, with one located on 122nd Avenue E and one located on 152nd Street E. The access would be reconfigured to limit turns to right-in/right-out at the 122nd Avenue E access and to relocate the 152nd Street E driveway farther west and away from the signalized 122nd Avenue E intersection. The separated school bus load/unload area along the east side of 120th Avenue Court E would be improved with new curb, sidewalk, and pull-out area. Frontage improvements would be provided as required by the County.

4.2. Traffic Volumes

The small increase in enrollment capacity from 708 to 730 students could generate increases in traffic and parking demand; the modification to access and parking would also change traffic patterns immediately surrounding the site. The following sections describe the potential net increases and changes in access patterns expected to result from the proposal during the key analysis periods.

4.2.1. School Trip Generation Rates

Peak hour trip generation for the school was calculated based upon the counts described previously in *Section 2.2. Traffic Volumes*, and the existing school enrollment at the time of the counts. The counts reflect all school-related activities as well as extracurricular use of the school and playfields. Table 3 summarizes the results of the trip generation study for Pope Elementary. It lists the average number of trips generated for a weekday (24-hours), the AM peak hour (8:00 to 9:00 A.M.), afternoon peak hour (2:45 to 3:45 P.M.), and the PM peak hour of the adjacent street (4:45 to 5:45 P.M.). The current school hours (typically 8:55 A.M. to 3:16 P.M. on Tuesdays through Fridays, with a later start of 9:55 A.M. on Mondays) are not proposed to change with the project.

Trip generation rates were calculated based on the existing enrollment at the time of the counts—573 students. The average rates published in the Institute of Transportation Engineers' [ITE] *Trip Generation Manual*¹¹ for Elementary Schools (Land Use Code 520) are shown for comparison. As shown, AM peak hour and afternoon peak hour rates observed at Pope Elementary are all somewhat higher than the average published ITE rates. The observed rates for daily and PM peak hour of the adjacent street are lower than the published ITE rates. All of the observed rates are well within the range of ITE rates published for each period and are reasonable for application in the analysis of this project. It is noted that these rates reflect all trips generated by the school, including student pick-up/drop-off, school bus trips, parent trips, teacher/staff trips, visitors, and after-hours use of fields or facilities.

¹¹ ITE, 10th Edition, 2017.



Table 3. Trip Generation Rates – Pope Elementary School

School / Reporting Period	Enrollment ¹ & Time Period	Number of Trips			Trip Rate (trips/student)			ITE Rates ² For Comparison
		In	Out	Total	In	Out	Total	
Pope Elementary	573 Students							
Average Weekday	24-hour	455	455	910	50%	50%	1.588	1.89 trips/student
AM Peak Hour	8:00 – 9:00 A.M.	218	189	407	54%	46%	0.710	0.67 trips/student
Afternoon Peak Hour	2:45 – 3:45 P.M.	104	145	249	42%	58%	0.435	0.34 trips/student
Street PM Peak Hour	4:45 – 5:45 P.M.	5	9	14	36%	64%	0.024	0.17 trips/student

Source: Number of trips is based on turning movement counts (TMCs) and machine counts performed at school's driveways. TMCs performed on Tuesday, October 24, 2017 and machine counts performed Tuesday, October 24 through Thursday, October 26, 2017.

1. Enrollment in fall 2017 provided by Puyallup School District for students in kindergarten through 6th grade.
2. ITE, Trip Generation Manual, 10th Edition, September 2017.

4.2.2. Trip Generation Estimates for Remodeled/Expanded School

Table 4 summarizes the forecast trip generation for the existing and proposed Pope Elementary School, based upon the calculated rates described above and the current and planned enrollment capacity (increasing from 708 students to 730 students). As shown, the project is forecast to result in net increases of 40 trips per day, 15 morning peak hour trips, 10 afternoon peak hour trips, and 5 PM peak hour trips.

Table 4. Trip Generation Estimates – Pope Elementary School Remodel / Expansion

Site Condition	Capacity (Students)	Daily Trips	Morning Peak Hour (8:00 to 9:00 A.M.)			Afternoon Peak Hour (2:45 to 3:45 P.M.)			PM Peak Hour (4:45 to 5:45 P.M.)		
			In	Out	Total	In	Out	Total	In	Out	Total
Remodeled / Expanded ¹	730	1,160	281	239	520	134	186	320	7	13	20
Existing School ²	708	1,120	273	232	505	130	180	310	5	10	15
Net Change	22	40	8	7	15	4	6	10	2	3	5

Source: Heffron Transportation, Inc., January 2018 using rates developed for Pope Elementary from counts in October 2017.

1. Proposed capacity of Pope Elementary.
2. Current capacity of Pope Elementary.

4.2.3. Trip Distribution and Assignment

Trip distribution patterns for the project-related traffic were developed from a combination of resources including: 1) the overall residential density within the existing enrollment area (shown on Figure 7) for Pope Elementary School; 2) local access patterns derived from the driveway and local intersection counts described previously; and 3) the proposed new site access, parking, and bus load/unload configuration.

Separate project trip distribution patterns and assignments were developed for the morning, afternoon, and PM peak hours to reflect typical patterns of some family drivers linking trips with work trips. About three-quarters of the school's enrollment area extends between 144th Street E to the north, Sunrise Boulevard E to the south, Meridian E (SR 161) to the west and 122nd Avenue E to the east. The remaining quarter of the enrollment area extends directly east of 122nd Avenue E to just east of 138th Avenue E. It is recognized that attendance areas are subject to review by the Boundary Review Committee and ultimately the Puyallup School Board. The project trip distribution patterns and net new trip assignments are shown in Figure 8 for the morning and afternoon peak hours and in Figure 9 for the PM peak hour.

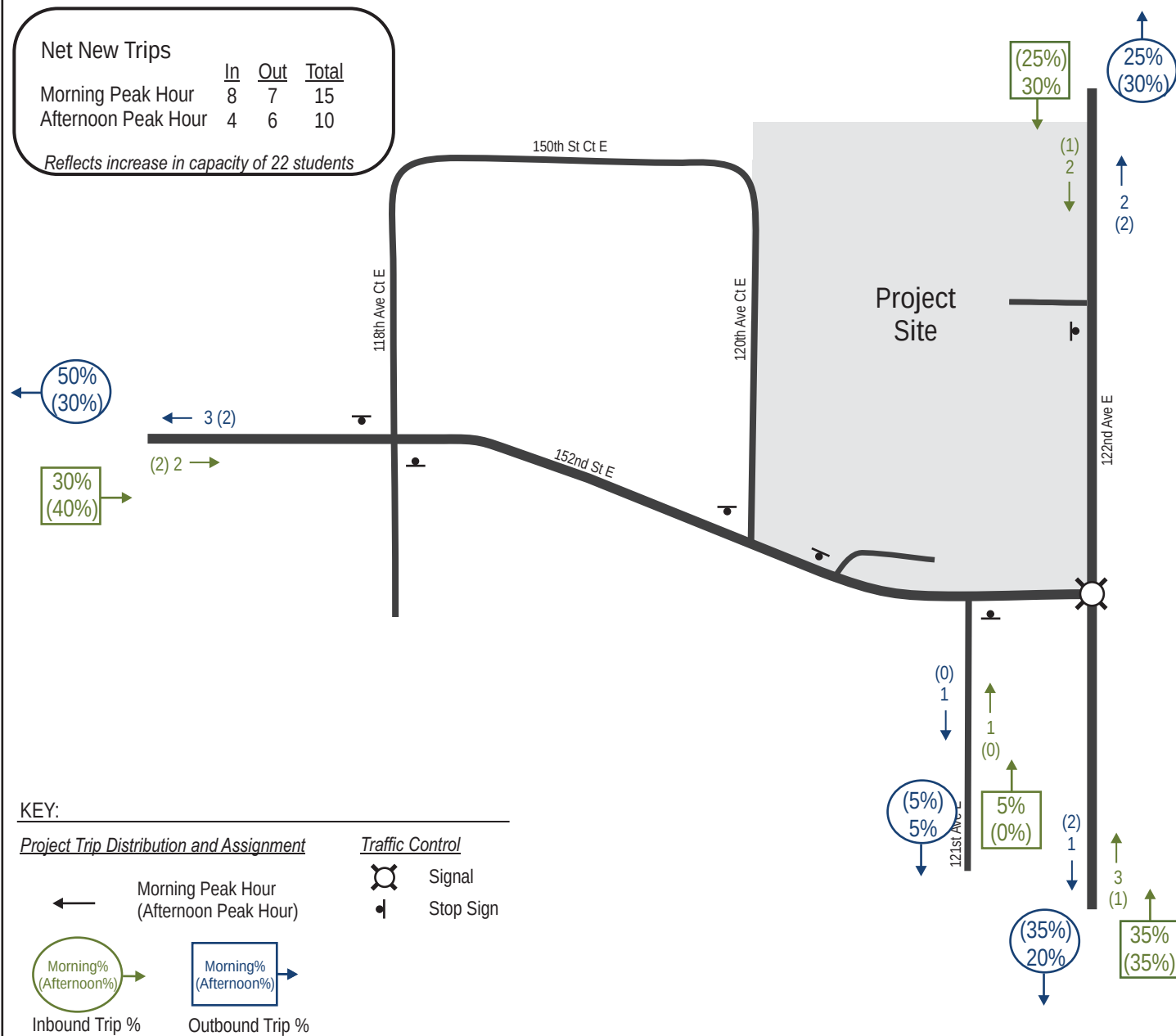


↑
N



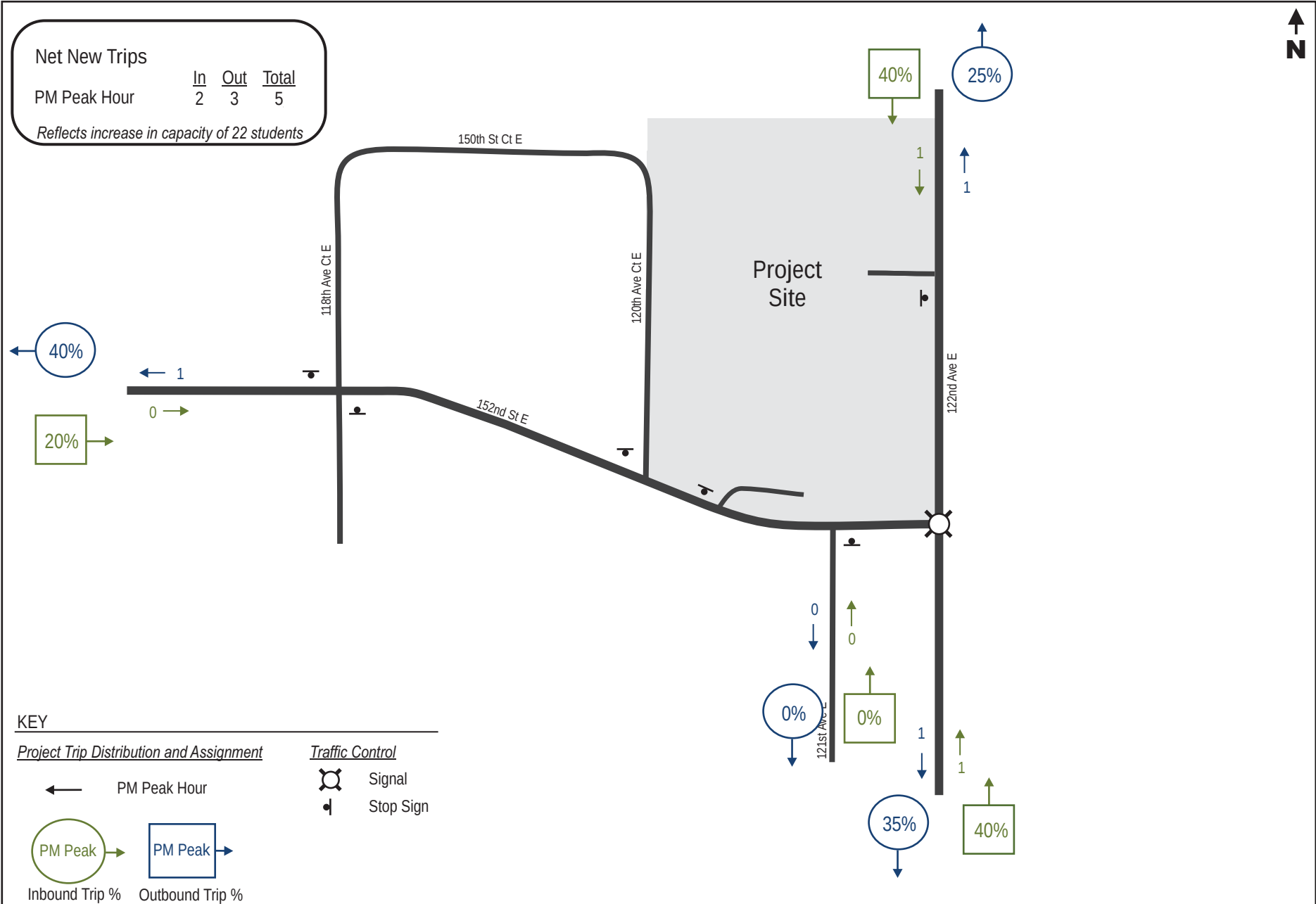
Net New Trips			
	In	Out	Total
Morning Peak Hour	8	7	15
Afternoon Peak Hour	4	6	10

Reflects increase in capacity of 22 students



POPE ELEMENTARY SCHOOL Remodel and Expansion

Figure 8
Net Trip Distribution and Assignments
Morning and Afternoon Peak Hours



POPE ELEMENTARY SCHOOL Remodel and Expansion

Figure 9
Net Trip Distribution and Assignments
PM Peak Hour

4.2.1. Forecast With-Project Traffic Volumes

The increase in site traffic generation was combined with re-assignments of all school-related traffic to develop forecasts of site-access and near-site volumes. The total forecast 2023 volumes with the proposed project are shown on Figure 10 for the morning and afternoon peak hours and Figure 11 for the PM peak hour.

4.3. Traffic Operations

4.3.1. Review of Channelization Requirements

The need for center left-turn lanes along 152nd Street E at 120th Street Court E and at the relocated main site access driveway was evaluated using the methodology in Highway Research Record (HRR) 211 *Volume Warrants for Left-Turn Storage Lanes at Unsignalized Grade Intersections*.¹² This methodology, which is preferred by Pierce County staff, is used to assess the need for left-turn lanes on a street or highway where left-turning drivers must yield to oncoming traffic. With this methodology, the left-turn lane is warranted if there is a high probability that left-turning vehicles would unduly delay vehicles approaching from the same direction as the left turn. The methodology is based on the relationship of advancing volume, opposing volume, and left-turn percentages at an unsignalized intersection.

To evaluate the warrants, the advancing volume, opposing volume, and left-turn percentages were compared to the applicable charts in the appendix of *HRR 211*. *HRR 211* provides specific curves for design speeds of 40 mph and above, and for left turn percentages of 5%, 10%, 20%, 30% and 40%. Due to the conditions along 152nd Street E (including a 20-mph school zone speed limit in effect during morning and afternoon peak hours) and left-turn volumes that represent percentages other than those provided, some interpolated curves were developed for this analysis.

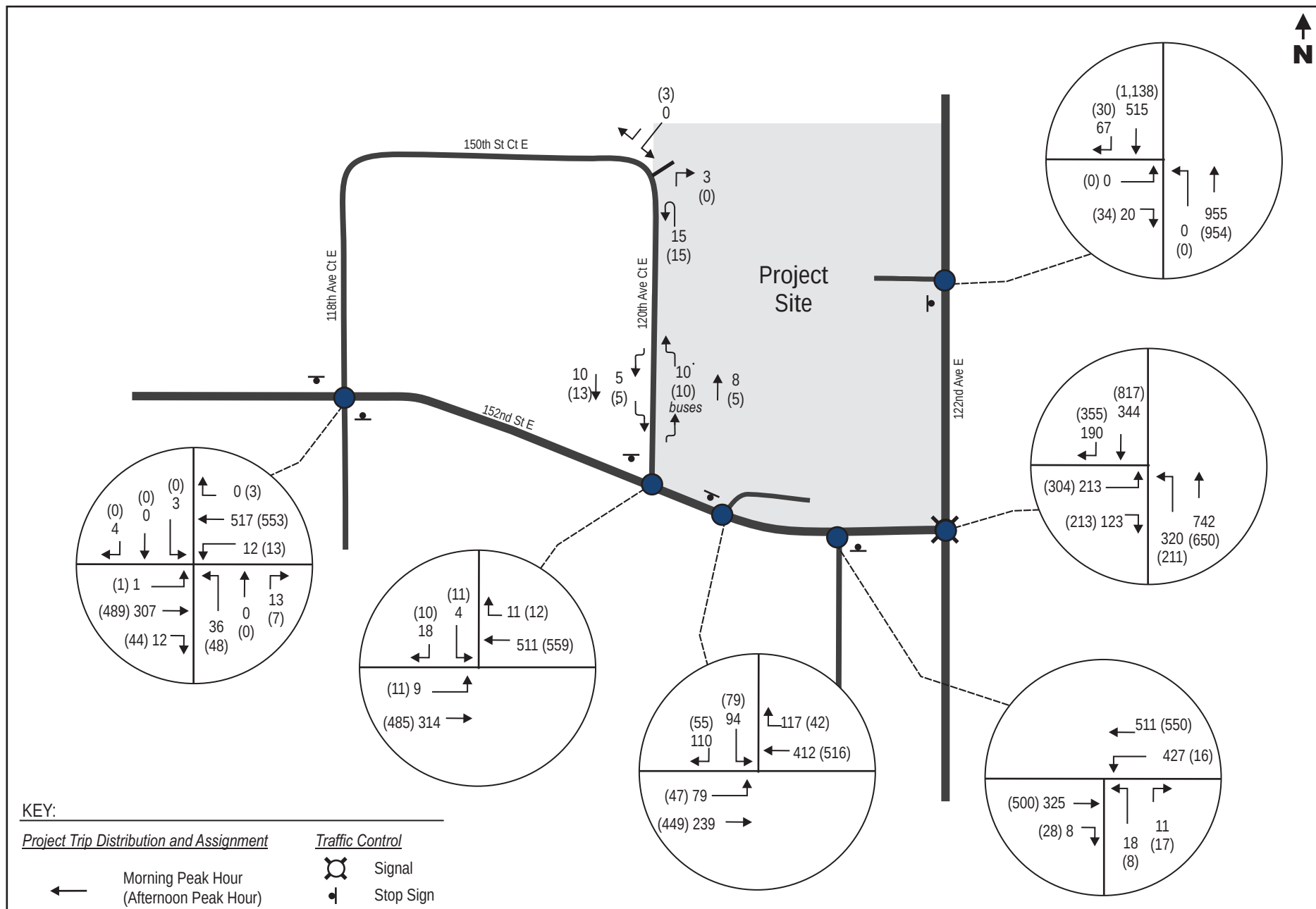
Table 5 summarizes the turning volumes and analysis results for the two intersections where left-turn lane analysis was performed. As shown, the highest volume of left-turns is expected to occur at the main access driveway on 152nd Street E (where passenger-vehicle access and egress would occur for drivers arriving from the west and south). Very few left turns currently occur at the 120th Avenue Court E intersection on 152nd Street E, since that area serve the school-bus load/unload area. With the site reconfiguration and enhanced on-site load/unload capacity, family drivers would be discouraged from using that roadway.

The main access driveway on 152nd Street E would meet warrants for left-turn storage during the morning and afternoon peak hours in 2023. The warrant analysis indicates required storage length of 75 feet for both periods. The warrant is not met at this location for the PM peak hour. Based on this analysis, a center, left-turn lane has been incorporated into the proposed project design and would extend east from the 122nd Avenue E intersection, through the 121st Avenue Court E intersection east of the relocated site access driveway.

Analyses of the 120th Avenue Court E intersection account for the low proportion of left-turns and the estimated warrant curves for those lower percentages. These analyses indicate that a warrant for storage would not be met. It is noted that existing volumes at the 152nd Street E intersection with 120th Avenue Court E also do not meet the warrant for storage and that it is only the assumed increases in background (non-school-generated) traffic along 152nd Street E that results in forecasts approaching the warrant thresholds. The turn lane analysis charts are included in Appendix D. Analysis assumes no left-turn storage and that the taper will be carried through the intersection as is the case elsewhere along 152nd Street E to the west of this site.

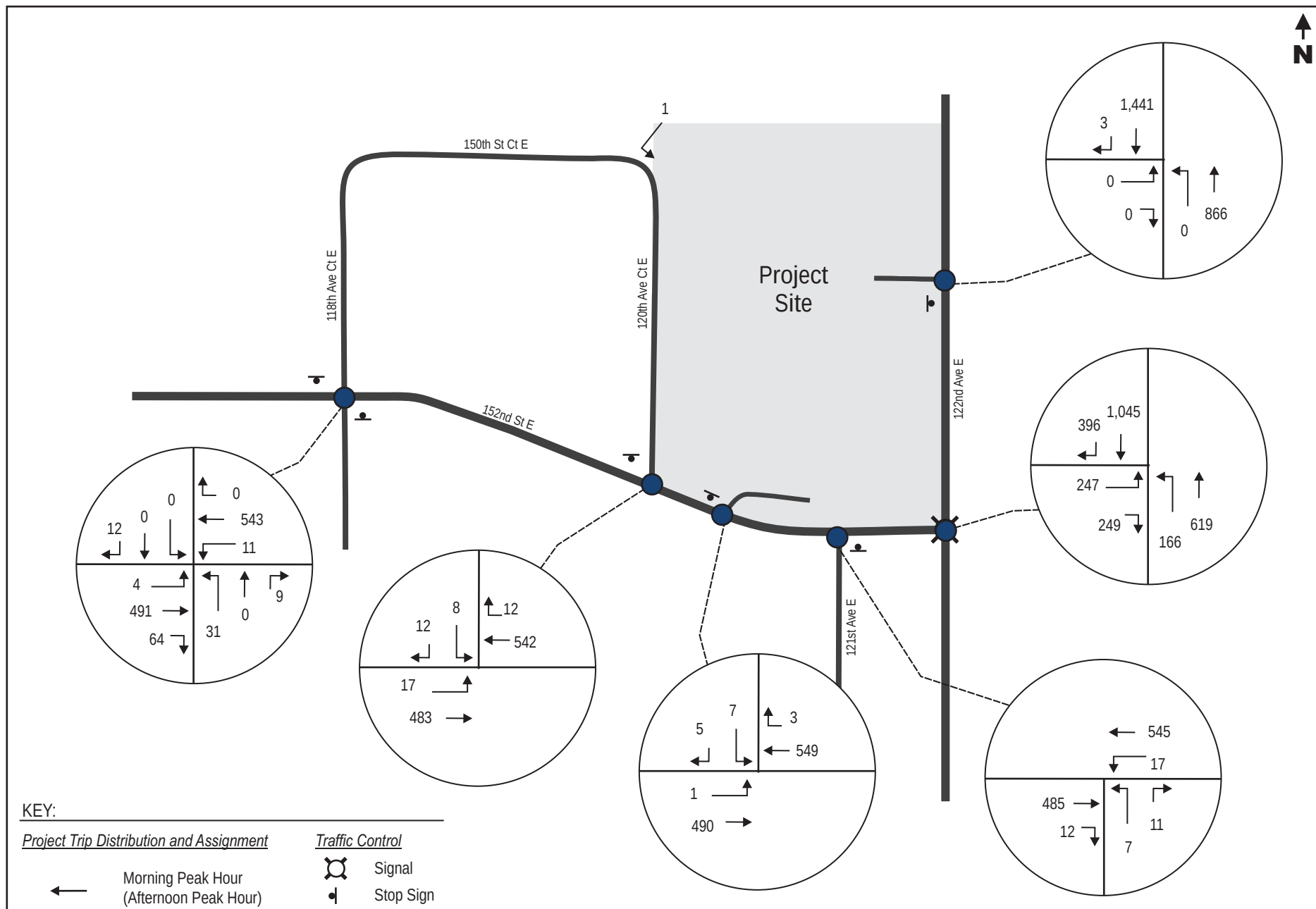
¹² Highway Research Board, 1967.





POPE ELEMENTARY SCHOOL Remodel and Expansion

Figure 10
Forecast 2023 With-Project Traffic Volumes
Morning and Afternoon Peak Hours



POPE ELEMENTARY SCHOOL Remodel and Expansion

Figure 11
Forecast 2023 With-Project Traffic Volumes
PM Peak Hour

Table 5. Left-Turn Lane Analysis Summary

Peak Period / Location	Left-turn Volume	Advancing Volume ^a	% Lefts	Opposing Volume ^b	Turn Lane Warranted?	Required Length
Left to Pope Elementary Dwy on 152 nd St E						
Morning Peak Hour	79	318	25%	529	Yes ^c	75 ft
Afternoon Peak Hour	47	496	9.5%	558	Yes ^d	75 ft
PM Peak Hour	1	491	0.2%	552	No ^e	n/a ^f
Left to 120 th Ave Ct E from 152 nd St Ct E						
Morning Peak Hour	9	323	2.8%	522	No ^e	n/a ^f
Afternoon Peak Hour	11	496	2.2%	571	No ^e	n/a ^f
PM Peak Hour	17	500	3.4%	554	No ^e	n/a ^f

Source: Heffron Transportation, Inc. (Feb. 2018) using HRR 211 – Aspects of Traffic Control Devices, Highway Research Board, 1967.

- a. Advancing Volume = Total of left-turning, through-, and right-turning vehicles.
- b. Opposing Volume = Total of vehicles in opposing lane.
- c. HRR 211 provides curves for conditions with left turns of 5%, 10%, 20%, 30%, and 40% of advancing traffic on roadways with speed limits of 40 mph or higher. Warrant for 75-foot storage met for both 20% and 30% curves.
- d. Tested using curve for L=10% at 40 mph.
- e. Tested using estimated curve for L=3.5% at 35 mph.
- f. n/a = not applicable.

4.3.2. Levels of Service

Intersection levels of service for with-project conditions were determined using the same methodology described previously. Table 6 summarizes forecast 2023-with-project levels of service; without-project results are shown for comparison. As shown, the project is forecast to add small amounts of delay to the signalized 152nd Street E / 122nd Avenue E intersection (increases are projected at less than 2 seconds of average delay per vehicle); the intersection would operate at LOS C or better during all periods with the project. Relocation of the site access driveway west and away from the 121st Avenue Court E intersection would improve operations and reduce delays for both approaches—eliminating the LOS F condition forecast for the school access. Similarly, the planned turn restriction at the site access on 122nd Avenue E is expected to improve operations from LOS F to LOS D. While some negligible decreases in delay are predicted for the 118th Avenue Court E intersection, the northbound movements are still expected to operate at LOS F during the afternoon peak hour. This would occur with or without the project and is reflective of the assumed increases in background traffic on 152nd Street E. The analyses of the 152nd Street E/120th Avenue Court E intersection assume no left-turn storage and that the taper will be carried through the intersection as occurs elsewhere along 152nd Street E to the west. Based on these analyses, the proposed project is expected to benefit traffic operations within the study area and no adverse impacts are expected. The level-of-service calculation sheets are provided in Appendix C.

In addition to the HRR 211 charts and analysis presented in the previous section, the potential queuing conditions along 152nd Street E were evaluated using *Synchro 10.1* and its companion *SimTraffic 10.1* micro-simulation software. Simulation models of the site driveways were developed to determine if school-generated left-turn queues could cause possible upstream blockages during the peak periods before and after school. These use the actual peak-hour factors determined from the driveway counts at Pope Elementary School. These also account for the fact that buses would use 120th Avenue Court E. Five simulation runs were performed. The operations analyses and simulations indicate that queues would very rarely impede through-traffic flow on 152nd Street E, and that an upstream blockage at 120th Avenue Court E would occur during 1% of the morning and afternoon peak hours (about 36 seconds of each hour). The simulations indicated no morning or afternoon peak blockages at the main site access on 152nd Street E. The simulation model results are included in Appendix E.



Table 6. Level of Service – Future (2023) With-Project

Control Type / Intersection	Morning Peak Hour (8:00 to 9:00 A.M.)		Afternoon Peak Hour (2:45 to 3:45 P.M.)		PM Peak Hour (4:45 to 5:45 P.M.)	
	2023 w/o- Project	2023 w/- Project	2023 w/o- Project	2023 w/- Project	2023 w/o- Project	2023 w/- Project
	LOS ^a Delay ^b	LOS Delay	LOS Delay	LOS Delay	LOS Delay	LOS Delay
Signalized						
152 nd St E / 122 nd Ave E ^c	A 9.7	A 10.0	B 16.8	B 18.0	C 26.0	C 26.2
Unsignalized						
152 nd St E / 121 st Ave Ct E (overall)	C 15.3	A 0.6	C 19.2	A 0.6	A 1.1	A 0.5
Northbound movement	D 26.4	C 15.6	D 29.1	B 14.9	C 18.6	B 13.5
Southbound movements	F 65.2	N/A ^d	F 113.4	N/A ^d	C 21.0	N/A ^d
Eastbound left turns	A 9.4	N/A ^d	A 8.7	N/A ^d	A 8.6	N/A ^d
Westbound left turns	A 0.0	A 0.0	A 8.5	A 8.8	A 8.5	A 8.5
152 nd St E / School Dwy (overall)	N/A ^e	A 6.6	N/A ^e	A 4.6	N/A ^e	A 0.3
Southbound left		D 32.6		D 26.7		C 15.2
Southbound right		C 19.2		B 13.7		B 12.0
Eastbound left		A 9.8		A 8.8		A 8.6
152 nd St E / 120 th Ave Ct E (overall)	A 1.2	A 0.5	A 1.3	A 1.0	A 0.7	A 0.7
Southbound movements	C 21.6	B 14.7	D 28.6	D 27.4	B 17.6	B 17.4
Eastbound left turns	B 10.3	A 9.4	A 9.8	B 10.1	A 8.7	A 8.7
152 nd St E / 118 th Ave Ct E (overall)	A 2.2	A 2.0	A 3.5	A 3.3	A 2.1	A 2.1
Northbound movement	E 39.5	E 38.3	F 56.0	F 54.1	D 34.8	D 34.8
Southbound movements	C 21.7	C 24.7	B 12.9	A 0.0	B 12.7	B 12.7
Eastbound left turns	A 9.7	A 9.7	A 9.0	A 9.0	A 8.6	A 8.7
Westbound left turns	A 8.3	A 8.3	A 8.8	A 8.9	A 8.7	A 8.7
122 nd Ave E / School Dwy (overall)	A 1.5	A 0.4	A 8.1	A 1.2	A 0.0	A 0.0
Northbound left	A 9.0	N/A ^f	B 11.7	N/A ^f	A 0.0	N/A ^f
Eastbound movements	D 32.3	B 13.5	F 178.3	D 34.2	A 0.0	A 0.0

Source: Heffron Transportation, Inc., February 2018.

a. Level of service.

b. Average seconds of delay per vehicle.

c. Eastbound left-turn phase analyzed as a protected to allow application of HCM 6 methodology, which requires NEMA compliant signal phasing. No pedestrian crossings of the north leg were observed during the analysis periods.

d. N/A = Not Applicable; movement would not exist with project due to driveway relocation.

e. N/A = Not Applicable; intersection does not currently exist and would not exist without project.

f. N/A = Not Applicable; driveway would be restricted to right-in/right-out (no left turns) with project.

4.4. Site Access Spacing & Sight Distance

4.4.1. Access Driveway Classifications and Standards

With the proposed remodel and expansion, the project site would have a total of three access driveways: one on 122nd Avenue E and two on 152nd Street E. The western access on 152nd Street E would be classified as a Minor Driveway Approach according to definitions in Section 5-2 of the *Manual on Design Guidelines and Specifications for Road and Bridge Construction*.¹³ The western access on 152nd

¹³ Office of the County Engineer, Pierce County, February 1, 2011.



Street E is planned for one-way access to the service/loading area and would have fewer than 1,500 vehicle trips per day and fewer than 150 vehicle trips per hour. The other two access driveways—the access on 122nd Avenue E and the eastern access on 152nd Street E—would be classified as Major Driveway approaches, since they would serve as the primary automobile access points for family drivers, visitors, most staff, and the automobile load/unload area.

Pierce County’s access driveway spacing and sight distance requirements are also outlined in the *Manual on Design Guidelines and Specifications for Road and Bridge Construction*. It states that both Minor and Major Driveway Approaches “...shall be located a minimum of 125 feet from an intersection” and that “Physical site conditions and spacing of existing driveway approaches may cause the County Engineer to require another location.”

The minimum Stopping Sight Distance (SSD) is the length of roadway ahead visible to a driver that would enable the vehicle traveling at the design speed to stop before reaching a stationary object in its path. It is measured from a driver’s eye height of 3.5 feet to an object height of 0.5 feet. Both 122nd Avenue E and 152nd Street E are Urban Secondary Arterials with design speeds of 40 mph and are relatively flat with no vertical sightline obstructions. Both have required minimum SSD of 305 feet.

Minimum Entering Sight Distance (ESD) is the distance required for a vehicle at a stopped position on the minor road (or driveway approach) to view an oncoming vehicle traveling at the speed limit on the major road and appearing after the movement has begun, and safely enter or cross the major road. Minimum values are based on an object (oncoming vehicle) height of 4.25 feet and a driver’s eye height of 3.5 feet set back from the edge of the travel way at least 10 feet for minor driveway approaches, and 14.5 feet for major driveway approaches. Both 122nd Avenue E and 152nd Street E have posted speed limits of 35 mph, which requires ESD of 415 feet for the access driveways on each roadway.

4.4.2. Spacing Analysis

The driveway on 122nd Avenue E is being retained in its existing location, which is approximately 400 feet north of 152nd Street E (as measured from the right-of-way line to the nearest edge of the access)—a signalized intersection. This driveway is located less than 125 feet from the 151st Street E intersection to the north. However, this is an existing condition and the proposal would restrict turns from the access to right-in/right-out only. To maximize the distance to the signalized intersection to the south and to maintain optimal on-site circulation, it is recommended that the driveway be approved to remain at its existing location.

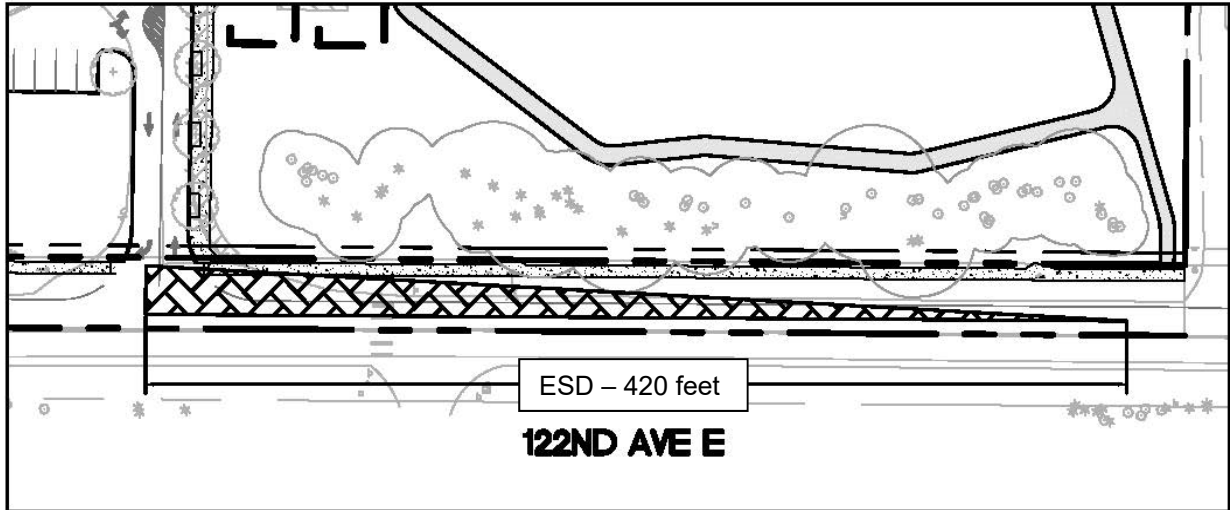
The easternmost driveway on 152nd Street E is proposed to be relocated westward away from the 121st Avenue Court E intersection. The proposed driveway location is 125 feet west of the intersection and is positioned to maximize the available length of the center, left-turn pocket proposed to serve the access and about 180 feet east of the 120th Avenue Court E right-of-way line. This proposed access location would meet County spacing requirements.

The western driveway on 152nd Street E is proposed to be retained at its existing location. It would serve one-way travel only for vehicles using the service/loading area. It would be located less than 125 feet from the eastern site access and from 120th Avenue Court E. However, due to the low volume of traffic expected to use this access (likely fewer than 10 trips per day), it would function similar to an alley or residential driveway, which have spacing requirements of 35 feet and 60 feet respectively. Due to the unique nature of this access function and low volume of traffic expected, it is recommended that the driveway be approved to remain at its existing location.

4.4.3. Sight Distance Analysis

Entering and stopping sight distances at the access driveways were reviewed. The sightlines at the driveway on 122nd Avenue E are not obstructed by vertical or horizontal curves nor vegetation. Field measured SSD at this driveway was greater than 465 feet and would meet the minimum 305 feet required. Field measured ESD was also greater than the minimum 465 feet and would meet the minimum required as illustrated on Figure 12.

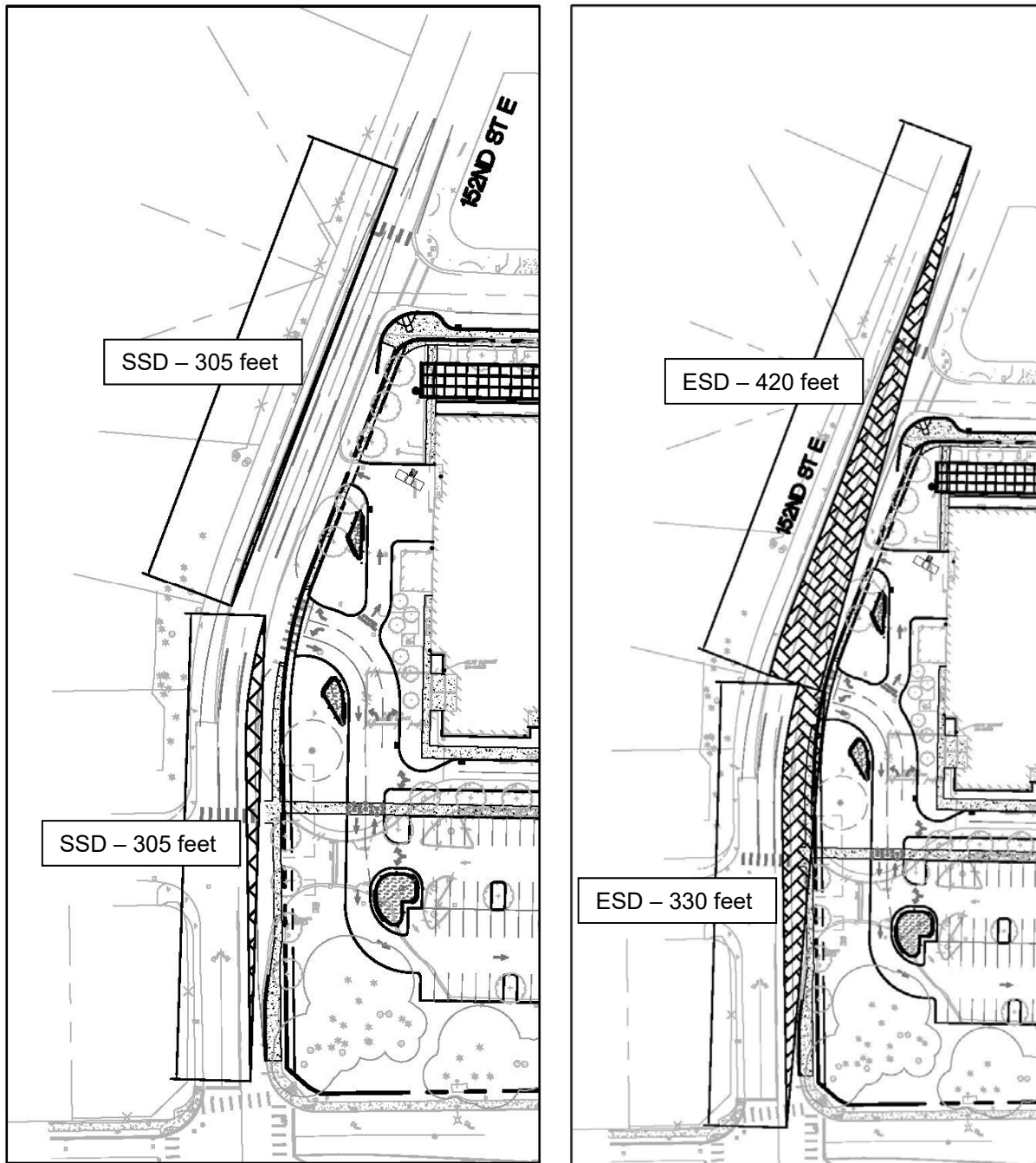
Figure 12. Entering Sight Distance – Access Driveway on 122nd Avenue E



Source: LPD Engineering, March 2018.

The sight lines from the proposed relocated eastern driveway on 152nd Street E are not obstructed by vertical curves but could be obstructed or limited due to a horizontal curve and vegetation. Field measurements of SSD at this proposed driveway location indicate greater than 350 feet exists to the west and the minimum of 305 feet can be provided to the east, as shown on Figure 13. Field measurements of ESD at this proposed driveway location indicate that the sightline to the west of greater than 470 feet can be achieved; the sightline to the east is clear to the signalized intersection with 122nd Avenue E, which is just over 330 feet. The ESD sight triangles are also shown on Figure 13. The ESD to the east exceeds the requirement for a posted speed limit of 25 mph (295 feet). Since vehicles arriving from the east would be turning from the signalized intersection, it is reasonable to expect they would be traveling at 25 mph or slower and that the ESD at the access would be adequate.

Figure 13. Sight Distance – Eastern Access Driveway on 152nd Street E
Stopping Sight Distance (SSD) Entering Sight Distance (ESD)

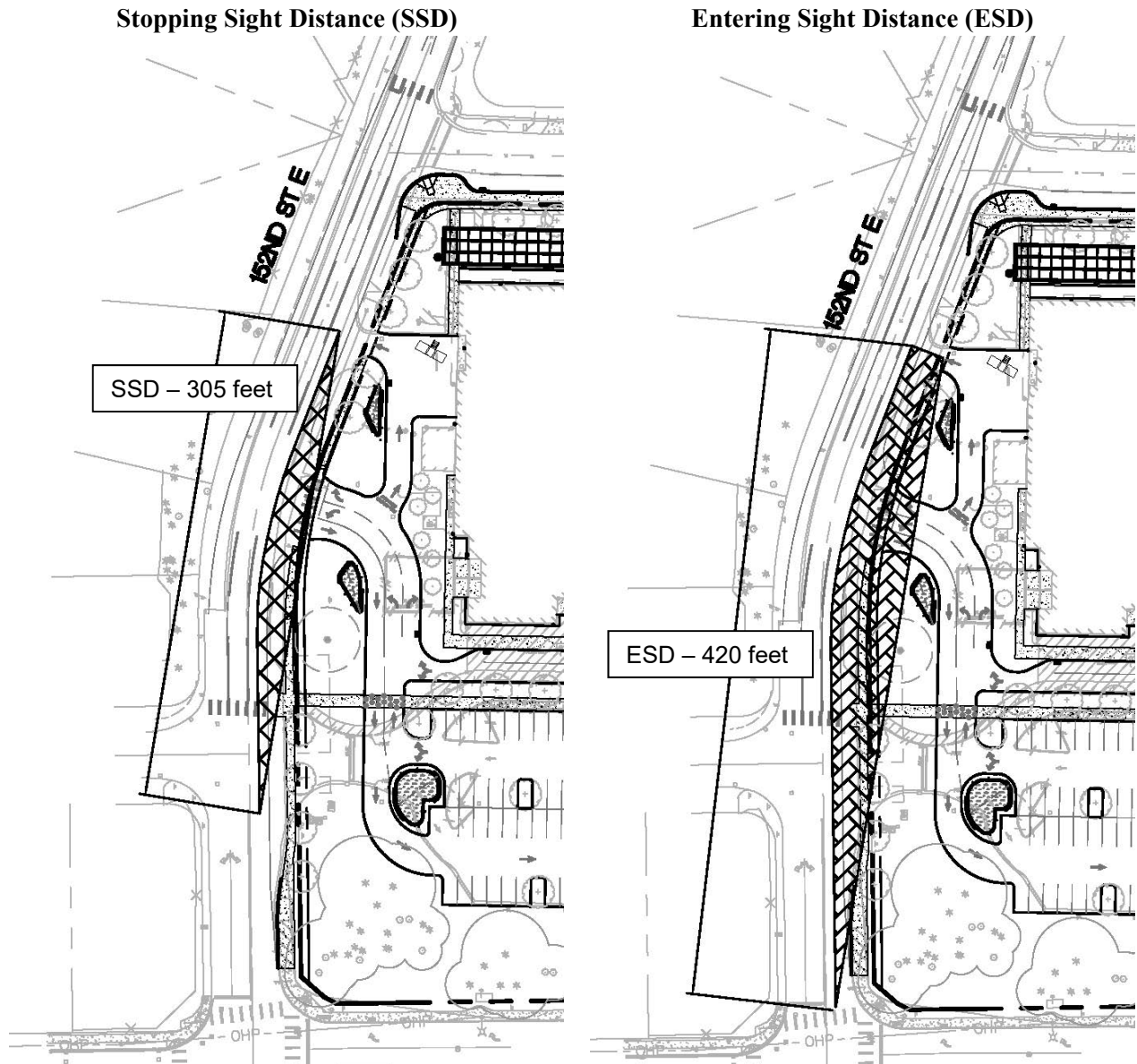


Source: LPD Engineering, March 2018.

The sight lines from the western service/loading access on 152nd Street E are also not obstructed by vertical curves but could be obstructed or limited due to a horizontal curve and vegetation. Field measurements of SSD at this proposed driveway location indicate that greater than 350 feet exists to the west. A minimum SSD of 305 feet can also be provided to the east as shown on Figure 14. Field measurements of ESD at this driveway location indicate that the sightline to the west is greater than 470 feet. An ESD sightline to the east of 420 feet can be achieved, but cuts across a portion of the project

site as shown on Figure 14. Due to the ESD constraints at this service/loading access, a sightline easement will be established that requires maintenance of the area within the sight triangle.

Figure 14. Sight Distance – Western (service) Access Driveway on 152nd Street E



Source: LPD Engineering, March 2018.

4.5. Transit Facilities & Service

It is unlikely that transit trips would be generated by teachers or staff at the site since the nearest transit stops are over a mile from the site. School bus transportation would continue to be provided to those students who qualify. The project is not expected to result in adverse impacts to transit.

4.6. Non-Motorized Transportation Facilities

The project would provide frontage improvements along 152nd Street E, 122nd Avenue E, and 120th Avenue Court E as required by Pierce County. These are proposed to include a new curb and sidewalk where it is not currently provided. The new curb and sidewalk along the east side of 120th Avenue Court E would enhance the school-bus load/unload area that currently exists along this segment. The project would construct pedestrian access pathways from the adjacent roadway network to the building and public spaces within the site. Prior to opening of the remodeled school, the District should review and identify any changes to walk routes, crosswalk locations, and/or crossing guard locations.

4.7. Parking

4.7.1. School Day Parking

As described previously, school-day parking at elementary schools is primarily driven by staffing levels and family-volunteer activity. The District estimates that Pope Elementary School could have up to 61 employees with the school at its planned capacity of 730 students. Using the parking rates derived specifically for Pope Elementary (1.05 to 1.33 parked vehicles per employee), the remodeled school is projected to have parking demand of 64 to 84 vehicles. The higher demand is likely to occur early to mid-morning when teachers, administrative staff, kitchen staff, volunteers, and possibly some family visitors could be on-site. The proposed on-site parking supply of 111 spaces is expected to accommodate typical school day parking demand.

4.7.2. Evening Event Parking

Pope Elementary School would retain common spaces and its gymnasium that would continue to be used for occasional evening and/or weekend events at the school. The small increase in enrollment capacity is not expected to noticeably change the attendance for these types of events. The proposal to increase the total on-site parking supply (increasing from 69 to 111 spaces for a net increase of 42 spaces) would better accommodate event parking and is expected to improve parking conditions.

5. MITIGATION

5.1. Physical Improvements

Based on the analysis required by the Pierce County, no improvements would be required at off-site intersections to accommodate the proposed Pope Elementary School Remodel / Expansion project. However, frontage improvements along 152nd Street E would consist of extending the center left-turn and making frontage improvements including curb, gutter, and sidewalk. The exact design and limits of the widening on 152nd Street E would be coordinated with Pierce County based on the various existing constraints including: proximity of nearby intersecting roadways, available right-of-way, sightline needs, and topographical constraints.

The planned restriction to right-in/right-out only for the access driveway on 122nd Avenue E would require a raised centerline c-curb be installed on 122nd Avenue E across the driveway and that roadway illumination be provide at that access driveway per County standards.

To provide adequate ESD to the east from the western service/loading access on 152nd Street E, a sightline easement will be established that requires maintenance of the area within the sight triangle.

5.2. Operational Recommendations

The following operational measures are recommended to reduce and minimize transportation-related impacts from the school remodel / expansion project.

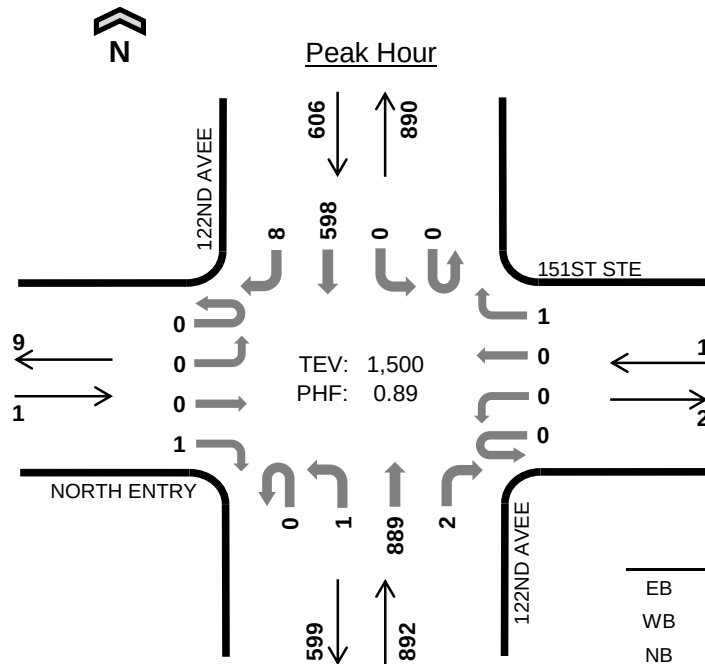
- A. Prior to re-opening of the remodeled school, the District should review and identify any changes to walk routes, crosswalk locations, and/or crossing guard locations.
- B. The District should require the selected contractor to develop a construction management plan (CMP) that addresses traffic and pedestrian control during school construction. It should define truck routes, lane closures, walkway closures, and parking disruptions, as necessary. The CMP may also include measures to keep adjacent streets clean on a daily basis at the truck exit points (such as street sweeping or on-site truck wheel cleaning) to reduce tracking dirt offsite. The CMP should identify parking locations for the construction staff; to the extent possible, construction employee parking should be contained on-site.

APPENDIX A

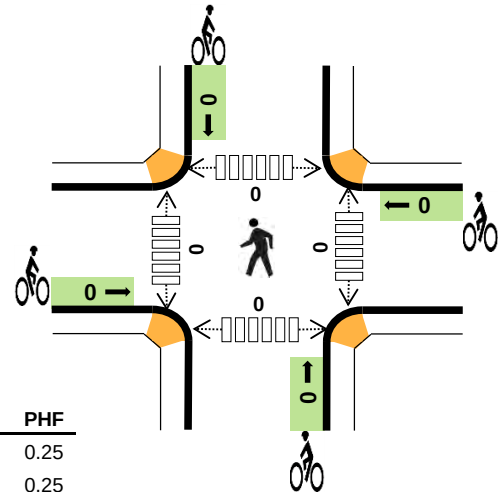
Traffic Count Data Sheets



122ND AVEE NORTH ENTRY



Date: Tue, Oct 24, 2017
Count Period: 7:00 AM to 9:30 AM
Peak Hour: 7:00 AM to 8:00 AM



	HV %:	PHF
EB	0.0%	0.25
WB	0.0%	0.25
NB	2.7%	0.97
SB	5.1%	0.79
TOTAL	3.7%	0.89

Two-and-a-Half-Hour Count Summaries

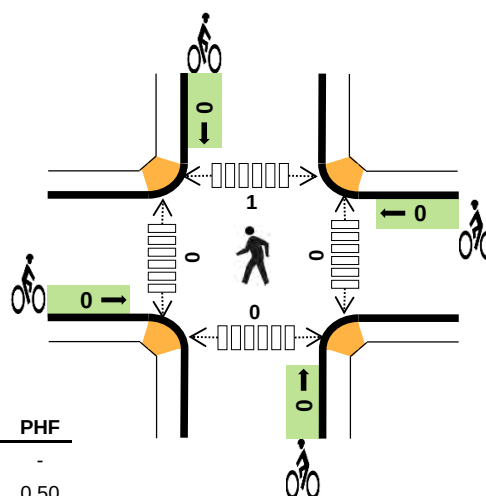
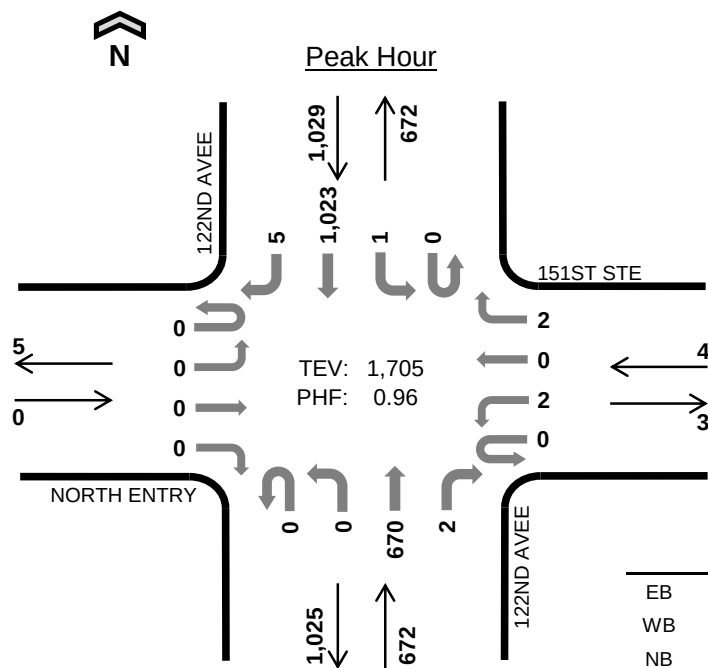
Interval Start	NORTH ENTRY				151ST STE				122ND AVEE				122ND AVEE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	212	0	0	0	124	0	336	0
7:15 AM	0	0	0	1	0	0	0	1	0	0	230	0	0	0	190	1	423	0
7:30 AM	0	0	0	0	0	0	0	0	0	1	220	1	0	0	182	2	406	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	227	1	0	0	102	5	335	1,500
Peak Hour	0	0	0	1	0	0	0	1	0	1	889	2	0	0	598	8	1,500	0

Note: For all three-hour count summary, see next page.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	4	5	9	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	2	14	16	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	7	9	16	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	11	3	14	0	0	0	0	0	0	0	0	0	0
Peak Hour	0	0	24	31	55	0	0	0	0	0	0	0	0	0	0

Two-and-a-Half-Hour Count Summaries																		
Interval Start	NORTH ENTRY				151ST STE				122ND AVEE				122ND AVEE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	212	0	0	0	124	0	336	0
7:15 AM	0	0	0	1	0	0	0	1	0	0	230	0	0	0	190	1	423	0
7:30 AM	0	0	0	0	0	0	0	0	0	1	220	1	0	0	182	2	406	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	227	1	0	0	102	5	335	1,500
8:00 AM	0	1	0	1	0	0	0	0	0	2	173	0	0	0	96	2	275	1,439
8:15 AM	0	0	0	0	0	0	0	1	0	4	159	0	0	0	85	11	260	1,276
8:30 AM	0	0	0	3	0	1	0	0	0	11	212	1	0	1	89	19	337	1,207
8:45 AM	0	4	0	11	0	0	0	1	0	7	166	2	0	0	100	19	310	1,182
9:00 AM	0	3	0	3	0	1	0	1	0	2	112	2	0	1	102	0	227	1,134
9:15 AM	0	1	0	0	0	0	0	1	0	0	130	0	0	0	82	1	215	1,089
Count Total	0	9	0	19	0	2	0	5	0	27	1,841	7	0	2	1,152	60	3,124	0
Peak Hour	0	0	0	1	0	0	0	1	0	1	889	2	0	0	598	8	1,500	0
Note: Two-and-a-half-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.																		
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)					Total		
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total			
7:00 AM	0	0	4	5	9	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	2	14	16	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	7	9	16	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	11	3	14	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	14	4	18	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	9	7	16	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	2	3	5	0	0	0	0	0	0	0	0	2	3	0	0	5
8:45 AM	0	0	15	9	24	0	0	0	0	0	0	0	0	4	4	0	0	8
9:00 AM	0	0	3	4	7	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	1	3	4	0	0	0	0	0	0	0	0	0	1	0	0	1
Count Total	0	0	68	61	129	0	0	0	0	0	0	0	0	6	8	0	0	14
Peak Hour	0	0	24	31	55	0	0	0	0	0	0	0	0	0	0	0	0	0

122ND AVEE NORTH ENTRY



	HV %:	PHF
EB	-	-
WB	0.0%	0.50
NB	0.9%	0.84
SB	1.0%	0.96
TOTAL	0.9%	0.96

Three-and-a-Half-Hour Count Summaries

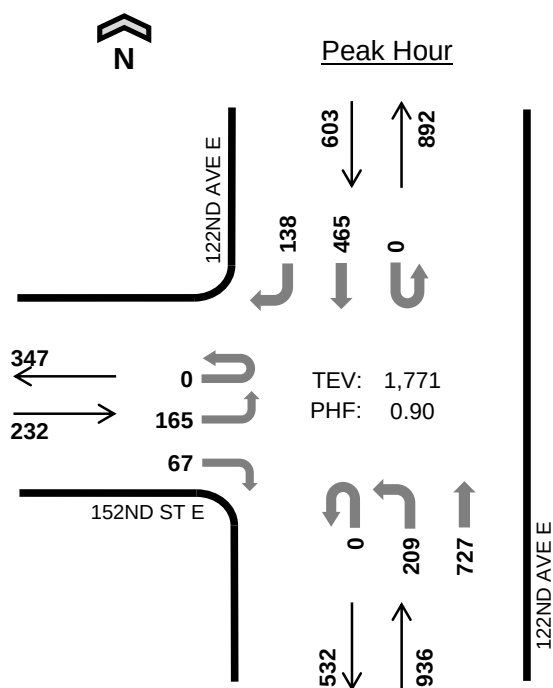
Interval Start	NORTH ENTRY				151ST STE				122ND AVEE				122ND AVEE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:30 PM	0	0	0	0	0	0	0	0	0	0	156	1	0	0	260	3	420	0
4:45 PM	0	0	0	0	0	0	0	2	0	0	165	0	0	1	266	2	436	0
5:00 PM	0	0	0	0	0	1	0	0	0	0	201	0	0	0	243	0	445	0
5:15 PM	0	0	0	0	0	1	0	0	0	0	148	1	0	0	254	0	404	1,705
Peak Hour	0	0	0	0	0	2	0	2	0	0	670	2	0	1	1,023	5	1,705	0

Note: For all three-hour count summary, see next page.

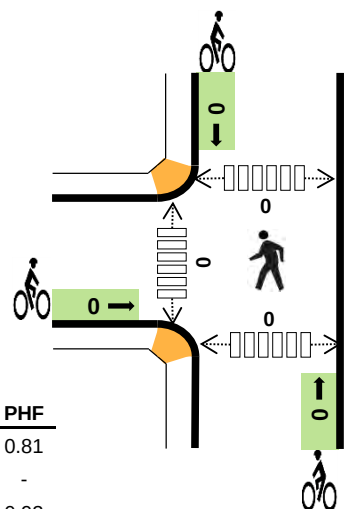
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:30 PM	0	0	2	4	6	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	2	3	5	0	0	0	0	0	0	0	1	0	1
5:00 PM	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0
Peak Hour	0	0	6	10	16	0	0	0	0	0	0	0	1	0	1

Three-and-a-Half-Hour Count Summaries																		
Interval Start	NORTH ENTRY				151ST STE				122ND AVEE				122ND AVEE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
2:30 PM	0	0	0	2	0	1	0	0	0	3	209	2	0	1	168	7	393	0
2:45 PM	0	0	0	2	0	0	0	0	0	1	190	1	0	1	182	8	385	0
3:00 PM	0	4	0	5	0	0	0	0	0	1	161	0	0	1	219	12	403	0
3:15 PM	0	4	0	16	0	1	0	3	0	2	179	1	0	0	200	3	409	1,590
3:30 PM	0	0	0	1	0	1	0	1	0	0	173	0	0	2	228	1	407	1,604
3:45 PM	0	2	0	1	0	1	0	2	0	0	156	0	0	3	238	0	403	1,622
4:00 PM	0	0	0	0	0	1	0	0	0	0	161	1	0	0	225	0	388	1,607
4:15 PM	0	0	0	0	0	0	0	0	0	0	170	1	0	1	219	0	391	1,589
4:30 PM	0	0	0	0	0	0	0	0	0	0	156	1	0	0	260	3	420	1,602
4:45 PM	0	0	0	0	0	0	0	2	0	0	165	0	0	1	266	2	436	1,635
5:00 PM	0	0	0	0	0	1	0	0	0	0	201	0	0	0	243	0	445	1,692
5:15 PM	0	0	0	0	0	1	0	0	0	0	148	1	0	0	254	0	404	1,705
5:30 PM	0	0	0	0	0	0	0	1	0	0	134	0	0	2	280	0	417	1,702
5:45 PM	0	0	0	0	0	0	0	1	0	0	146	0	2	2	269	0	420	1,686
Count Total	0	10	0	27	0	7	0	10	0	7	2,349	8	2	14	3,251	36	5,721	0
Peak Hour	0	0	0	0	0	2	0	2	0	0	670	2	0	1	1,023	5	1,705	0
Note: Three-and-a-half-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.																		
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)					Total		
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South				
2:30 PM	0	0	6	4	10	0	0	1	0	1	0	0	0	0	0	0	0	
2:45 PM	0	0	8	5	13	0	0	0	0	0	0	1	1	0	2	0	2	
3:00 PM	0	0	7	8	15	0	0	0	0	0	0	2	4	0	6	0	6	
3:15 PM	0	0	6	6	12	0	0	0	0	0	1	12	29	0	42	0	42	
3:30 PM	0	0	4	6	10	0	0	0	0	0	0	0	0	0	0	0	0	
3:45 PM	0	0	2	8	10	0	0	0	0	0	0	0	2	0	2	0	2	
4:00 PM	0	0	2	5	7	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 PM	0	0	2	2	4	0	0	0	0	0	2	0	0	1	3	0	3	
4:30 PM	0	0	2	4	6	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	0	0	2	3	5	0	0	0	0	0	0	0	1	0	1	0	1	
5:00 PM	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	
5:15 PM	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	
5:30 PM	0	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	
5:45 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
Count Total	0	0	45	56	101	0	0	1	0	1	3	15	37	1	56	0	56	
Peak Hour	0	0	6	10	16	0	0	0	0	0	0	0	1	0	1	0	1	

122ND AVE E 152ND ST E



Date: Tue, Oct 24, 2017
Count Period: 7:00 AM to 9:30 AM
Peak Hour: 7:00 AM to 8:00 AM



	HV %:	PHF
EB	2.6%	0.81
WB	-	-
NB	2.7%	0.93
SB	5.0%	0.79
TOTAL	3.4%	0.90

Two-and-a-Half-Hour Count Summaries

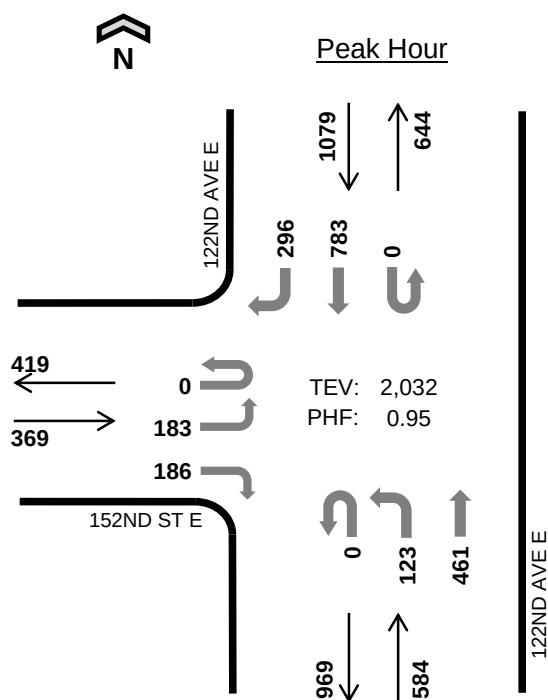
Interval Start	152ND ST E				0				122ND AVE E				122ND AVE E				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	44	0	10	0	0	0	0	0	52	171	0	0	0	95	26	398	0
7:15 AM	0	47	0	25	0	0	0	0	0	49	182	0	0	0	154	35	492	0
7:30 AM	0	44	0	17	0	0	0	0	0	54	176	0	0	0	155	35	481	0
7:45 AM	0	30	0	15	0	0	0	0	0	54	198	0	0	0	61	42	400	1,771
Peak Hour	0	165	0	67	0	0	0	0	0	209	727	0	0	0	465	138	1,771	0

Note: For all three-hour count summary, see next page.

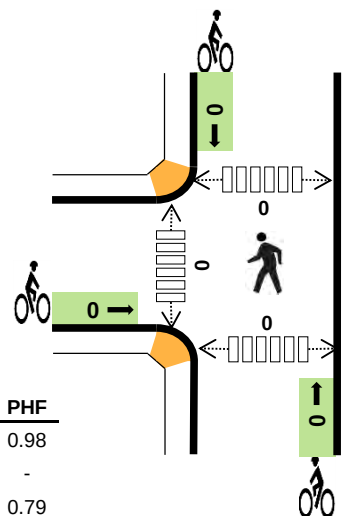
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	0	3	4	8	0	0	0	0	0	0	0	0	0	0
7:15 AM	2	0	4	11	17	0	0	0	0	0	0	0	0	0	0
7:30 AM	1	0	6	12	19	0	0	0	0	0	0	0	0	0	0
7:45 AM	2	0	12	3	17	0	0	0	0	0	0	0	0	0	0
Peak Hour	6	0	25	30	61	0	0	0	0	0	0	0	0	0	0

Two-and-a-Half-Hour Count Summaries																		
Interval Start	152ND ST E				0				122ND AVE E				122ND AVE E				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	44	0	10	0	0	0	0	0	52	171	0	0	0	95	26	398	0
7:15 AM	0	47	0	25	0	0	0	0	0	49	182	0	0	0	154	35	492	0
7:30 AM	0	44	0	17	0	0	0	0	0	54	176	0	0	0	155	35	481	0
7:45 AM	0	30	0	15	0	0	0	0	0	54	198	0	0	0	61	42	400	1,771
8:00 AM	0	43	0	12	0	0	0	0	0	34	133	0	0	0	70	28	320	1,693
8:15 AM	0	30	0	23	0	0	0	0	0	40	135	0	0	0	66	22	316	1,517
8:30 AM	0	45	0	37	0	0	0	0	0	63	177	0	0	0	48	45	415	1,451
8:45 AM	0	36	0	21	0	0	0	0	0	83	134	0	0	0	74	48	396	1,447
9:00 AM	0	16	0	12	0	0	0	0	0	27	98	0	0	0	65	40	258	1,385
9:15 AM	0	28	0	9	0	0	0	0	0	23	103	0	0	0	63	22	248	1,317
Count Total	0	363	0	181	0	0	0	0	0	479	1,507	0	0	0	851	343	3,724	0
Peak Hour	0	165	0	67	0	0	0	0	0	209	727	0	0	0	465	138	1,771	0
Note: Two-and-a-half-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.																		
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)					Total		
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total			
7:00 AM	1	0	3	4	8	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	2	0	4	11	17	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	1	0	6	12	19	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	2	0	12	3	17	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	3	0	14	4	21	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	4	0	9	6	19	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	3	0	4	3	10	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	2	0	24	9	35	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	1	0	3	4	8	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	1	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	19	0	80	59	158	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hr	6	0	25	30	61	0	0	0	0	0	0	0	0	0	0	0	0	0

122ND AVE E 152ND ST E



Date: Tue, Oct 24, 2017
Count Period: 2:30 PM to 6:00 PM
Peak Hour: 4:45 PM to 5:45 PM



	HV %:	PHF
EB	1.1%	0.98
WB	-	-
NB	1.0%	0.79
SB	0.6%	0.92
TOTAL	0.8%	0.95

Three-and-a-Half-Hour Count Summaries

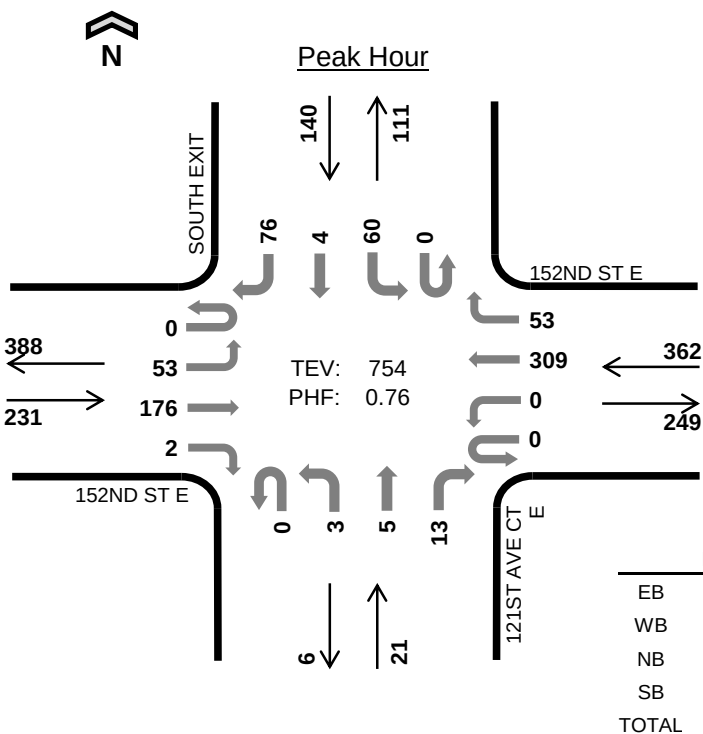
Interval Start	152ND ST E				0				122ND AVE E				122ND AVE E				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:45 PM	0	46	0	47	0	0	0	0	0	32	117	0	0	0	192	81	515	0
5:00 PM	0	50	0	40	0	0	0	0	0	35	150	0	0	0	193	67	535	0
5:15 PM	0	45	0	47	0	0	0	0	0	30	103	0	0	0	186	66	477	0
5:30 PM	0	42	0	52	0	0	0	0	0	26	91	0	0	0	212	82	505	2,032
Peak Hour	0	183	0	186	0	0	0	0	0	123	461	0	0	0	783	296	2,032	0

Note: For all three-hour count summary, see next page.

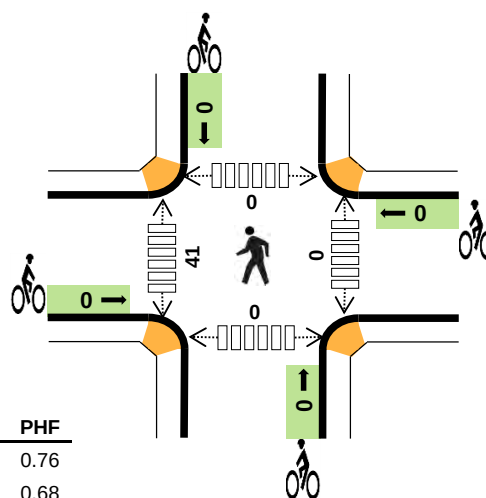
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:45 PM	1	0	2	3	6	0	0	0	0	0	0	0	0	0	0
5:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5:15 PM	2	0	1	2	5	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	3	1	4	0	0	0	0	0	0	0	0	0	0
Peak Hour	4	0	6	6	16	0	0	0	0	0	0	0	0	0	0

Three-and-a-Half-Hour Count Summaries																		
Interval Start	152ND ST E				0				122ND AVE E				122ND AVE E				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
2:30 PM	0	34	0	26	0	0	0	0	0	43	181	0	0	0	132	43	459	0
2:45 PM	0	48	0	32	0	0	0	0	0	48	141	0	0	0	131	53	453	0
3:00 PM	0	49	0	30	0	0	0	0	0	32	119	0	0	0	160	71	461	0
3:15 PM	0	56	0	52	0	0	0	0	0	39	126	0	0	0	161	71	505	1,878
3:30 PM	0	71	0	51	0	0	0	0	0	32	107	0	0	0	159	75	495	1,914
3:45 PM	0	47	0	38	0	0	0	0	0	36	111	0	0	0	175	63	470	1,931
4:00 PM	0	54	0	41	0	0	0	0	0	29	113	0	0	0	174	61	472	1,942
4:15 PM	0	39	0	41	0	0	0	0	0	30	133	0	0	0	168	55	466	1,903
4:30 PM	0	52	0	47	0	0	0	0	0	36	108	0	0	0	185	70	498	1,906
4:45 PM	0	46	0	47	0	0	0	0	0	32	117	0	0	0	192	81	515	1,951
5:00 PM	0	50	0	40	0	0	0	0	0	35	150	0	0	0	193	67	535	2,014
5:15 PM	0	45	0	47	0	0	0	0	0	30	103	0	0	0	186	66	477	2,025
5:30 PM	0	42	0	52	0	0	0	0	0	26	91	0	0	0	212	82	505	2,032
5:45 PM	0	40	0	39	0	0	0	0	0	27	107	0	0	0	189	88	490	2,007
Count Total	0	673	0	583	0	0	0	0	0	475	1,707	0	0	0	2,417	946	6,801	0
Peak Hour	0	183	0	186	0	0	0	0	0	123	461	0	0	0	783	296	2,032	0
Note: Three-and-a-half-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.																		
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)					Total		
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South				
2:30 PM	2	0	7	3	12	0	0	1	0	1	0	0	0	0	0	0	0	
2:45 PM	2	0	11	5	18	0	0	0	0	0	0	0	0	0	0	0	0	
3:00 PM	5	0	5	8	18	0	0	0	0	0	0	0	0	0	0	0	0	
3:15 PM	6	0	4	6	16	0	0	0	0	0	0	0	0	0	0	0	0	
3:30 PM	3	0	7	6	16	0	0	0	0	0	0	0	0	0	0	0	0	
3:45 PM	0	0	4	8	12	0	0	0	0	0	0	0	0	0	0	0	0	
4:00 PM	1	0	3	5	9	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 PM	2	0	1	2	5	0	0	0	0	0	0	0	0	0	0	0	0	
4:30 PM	0	0	2	4	6	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	1	0	2	3	6	0	0	0	0	0	0	0	0	0	0	0	0	
5:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
5:15 PM	2	0	1	2	5	0	0	0	0	0	0	0	0	0	0	0	0	
5:30 PM	0	0	3	1	4	0	0	0	0	0	0	0	0	0	0	0	0	
5:45 PM	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	
Count Total	25	0	51	54	130	0	0	1	0	1	0	0	0	0	0	0	0	
Peak Hr	4	0	6	6	16	0	0	0	0	0	0	0	0	0	0	0	0	

121ST AVE CT E 152ND ST E



Date: Tue, Oct 24, 2017
Count Period: 7:00 AM to 9:30 AM
Peak Hour: 8:00 AM to 9:00 AM



Two-and-a-Half-Hour Count Summaries

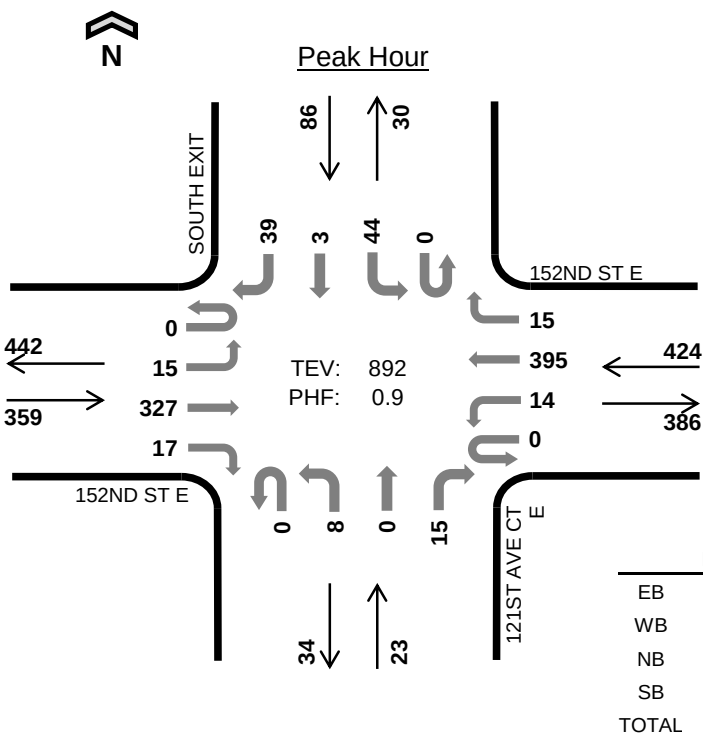
Interval Start	152ND ST E Eastbound				152ND ST E Westbound				121ST AVE CT E Northbound				SOUTH EXIT Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
8:00 AM	0	4	51	0	0	0	56	4	0	0	0	4	0	2	0	2	123	0
8:15 AM	0	16	40	0	0	0	55	8	0	0	1	2	0	9	1	9	141	0
8:30 AM	0	20	55	1	0	0	86	19	0	0	2	4	0	25	2	28	242	0
8:45 AM	0	13	30	1	0	0	112	22	0	3	2	3	0	24	1	37	248	754
Peak Hour	0	53	176	2	0	0	309	53	0	3	5	13	0	60	4	76	754	0

Note: For all three-hour count summary, see next page.

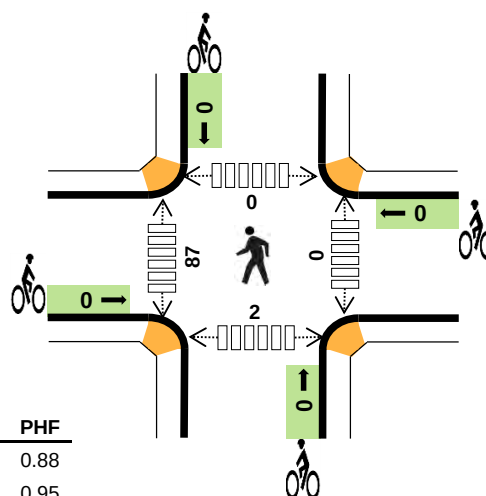
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
8:00 AM	2	2	1	0	5	0	0	0	0	0	0	0	0	0	0
8:15 AM	5	3	0	0	8	0	0	0	0	0	0	0	0	0	0
8:30 AM	3	5	0	0	8	0	0	0	0	0	0	18	0	0	18
8:45 AM	3	13	0	0	16	0	0	0	0	0	0	23	0	0	23
Peak Hour	13	23	1	0	37	0	0	0	0	0	0	41	0	0	41

Two-and-a-Half-Hour Count Summaries																		
Interval Start	152ND ST E				152ND ST E				121ST AVE CT E				SOUTH EXIT				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	2	51	1	0	0	77	1	0	2	0	4	0	0	0	0	138	0
7:15 AM	0	5	70	2	0	2	80	0	0	2	0	2	0	0	0	0	163	0
7:30 AM	0	5	58	1	0	1	87	1	0	2	0	4	0	0	0	0	159	0
7:45 AM	0	7	44	4	0	1	94	1	0	1	0	0	0	1	0	0	153	613
8:00 AM	0	4	51	0	0	0	56	4	0	0	0	4	0	2	0	2	123	598
8:15 AM	0	16	40	0	0	0	55	8	0	0	1	2	0	9	1	9	141	576
8:30 AM	0	20	55	1	0	0	86	19	0	0	2	4	0	25	2	28	242	659
8:45 AM	0	13	30	1	0	0	112	22	0	3	2	3	0	24	1	37	248	754
9:00 AM	0	2	27	2	0	3	64	1	0	1	0	1	0	1	0	3	105	736
9:15 AM	0	0	34	0	0	0	43	1	0	2	0	1	0	1	0	3	85	680
Count Total	0	74	460	12	0	7	754	58	0	13	5	25	0	63	4	82	1,557	0
Peak Hour	0	53	176	2	0	0	309	53	0	3	5	13	0	60	4	76	754	0
Note: Two-and-a-half-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.																		
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)					Total		
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total			
7:00 AM	1	2	1	0	4	0	0	0	0	0	0	1	0	0	0	1		
7:15 AM	2	3	1	0	6	0	0	0	0	0	0	1	0	0	0	1		
7:30 AM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0		
7:45 AM	3	1	0	0	4	0	0	0	0	0	0	0	0	0	0	0		
8:00 AM	2	2	1	0	5	0	0	0	0	0	0	0	0	0	0	0		
8:15 AM	5	3	0	0	8	0	0	0	0	0	0	0	0	0	0	0		
8:30 AM	3	5	0	0	8	0	0	0	0	0	0	0	18	0	0	18		
8:45 AM	3	13	0	0	16	0	0	0	0	0	0	0	23	0	0	23		
9:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0		
9:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0		
Count Total	20	32	3	0	55	0	0	0	0	0	0	0	43	0	0	43		
Peak Hour	13	23	1	0	37	0	0	0	0	0	0	0	41	0	0	41		

121ST AVE CT E 152ND ST E



Date: Tue, Oct 24, 2017
Count Period: 2:30 PM to 6:00 PM
Peak Hour: 3:00 PM to 4:00 PM



Three-and-a-Half-Hour Count Summaries

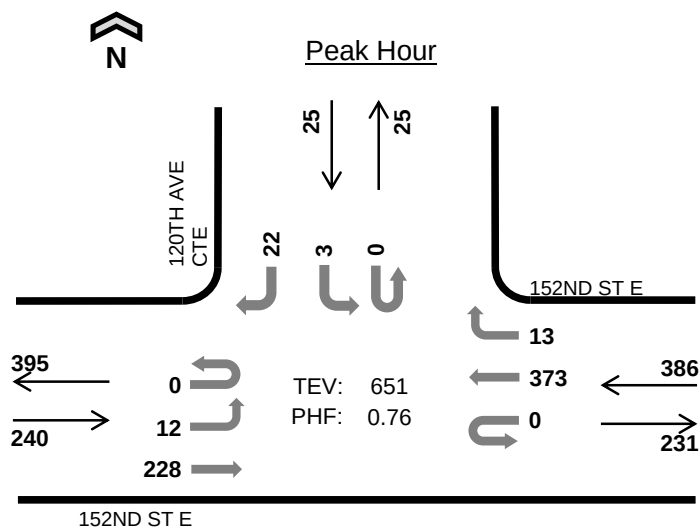
Interval Start	152ND ST E Eastbound				152ND ST E Westbound				121ST AVE CT E Northbound				SOUTH EXIT Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:00 PM	0	10	73	8	0	5	91	8	0	0	0	3	0	6	0	4	208	0
3:15 PM	0	4	80	2	0	4	100	7	0	2	0	5	0	21	2	20	247	0
3:30 PM	0	1	99	2	0	5	103	0	0	1	0	3	0	12	1	8	235	0
3:45 PM	0	0	75	5	0	0	101	0	0	5	0	4	0	5	0	7	202	892
Peak Hour	0	15	327	17	0	14	395	15	0	8	0	15	0	44	3	39	892	0

Note: For all three-hour count summary, see next page.

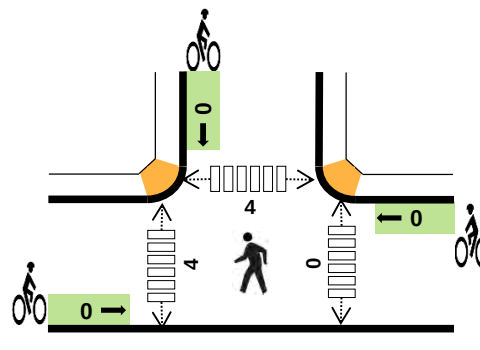
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
3:00 PM	6	4	0	0	10	0	0	0	0	0	0	17	0	2	19
3:15 PM	6	4	0	0	10	0	0	0	0	0	0	67	0	0	67
3:30 PM	1	6	1	0	8	0	0	0	0	0	0	3	0	0	3
3:45 PM	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0
Peak Hour	13	19	1	0	33	0	0	0	0	0	0	87	0	2	89

Three-and-a-Half-Hour Count Summaries																		
Interval Start	152ND ST E				152ND ST E				121ST AVE CT E				SOUTH EXIT				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
2:30 PM	0	5	55	1	0	2	82	8	0	1	0	1	0	1	0	1	157	0
2:45 PM	0	9	74	4	0	0	91	7	0	3	0	2	0	3	1	2	196	0
3:00 PM	0	10	73	8	0	5	91	8	0	0	0	3	0	6	0	4	208	0
3:15 PM	0	4	80	2	0	4	100	7	0	2	0	5	0	21	2	20	247	808
3:30 PM	0	1	99	2	0	5	103	0	0	1	0	3	0	12	1	8	235	886
3:45 PM	0	0	75	5	0	0	101	0	0	5	0	4	0	5	0	7	202	892
4:00 PM	0	0	87	1	0	4	86	0	0	2	0	3	0	2	0	3	188	872
4:15 PM	0	1	79	0	0	3	80	0	0	2	0	0	0	0	0	5	170	795
4:30 PM	0	1	93	1	1	1	101	2	0	2	0	1	0	1	0	4	208	768
4:45 PM	0	0	90	2	0	2	110	2	0	0	0	2	0	4	0	2	214	780
5:00 PM	0	1	92	1	0	2	101	0	0	0	0	1	0	1	0	1	200	792
5:15 PM	0	0	81	3	0	2	92	0	0	2	0	3	0	0	0	0	183	805
5:30 PM	0	0	95	3	0	7	101	0	0	3	0	2	0	0	0	1	212	809
5:45 PM	0	0	68	2	0	4	111	1	0	1	0	2	0	3	0	4	196	791
Count Total	0	32	1,141	35	1	41	1,350	35	0	24	0	32	0	59	4	62	2,816	0
Peak Hour	0	15	327	17	0	14	395	15	0	8	0	15	0	44	3	39	892	0
Note: Three-and-a-half-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.																		
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)					Total		
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South				
2:30 PM	2	2	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	
2:45 PM	2	6	1	0	9	0	0	0	1	1	0	0	0	0	0	0	0	
3:00 PM	6	4	0	0	10	0	0	0	0	0	0	17	0	2	19	19		
3:15 PM	6	4	0	0	10	0	0	0	0	0	0	67	0	0	67	67		
3:30 PM	1	6	1	0	8	0	0	0	0	0	0	3	0	0	3	3		
3:45 PM	0	5	0	0	5	0	0	0	0	0	0	0	0	0	0	0		
4:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0		
4:15 PM	2	1	1	0	4	0	1	0	0	1	0	0	1	0	1	1		
4:30 PM	0	0	1	1	2	0	0	0	0	0	1	0	0	0	1	1		
4:45 PM	2	2	0	0	4	0	0	0	0	0	0	0	0	0	0	0		
5:00 PM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0		
5:15 PM	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1	1		
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1		
5:45 PM	0	1	0	0	1	0	0	0	0	0	0	2	0	0	2	2		
Count Total	25	32	4	1	62	0	1	0	1	2	1	91	1	2	95	95		
Peak Hour	13	19	1	0	33	0	0	0	0	0	0	87	0	2	89	89		

120TH AVE CTE 152ND ST E



Date: Tue, Oct 24, 2017
Count Period: 7:00 AM to 9:30 AM
Peak Hour: 8:00 AM to 9:00 AM



	HV %:	PHF
EB	6.7%	0.73
WB	6.0%	0.63
NB	-	-
SB	40.0%	0.42
TOTAL	7.5%	0.76

Two-and-a-Half-Hour Count Summaries

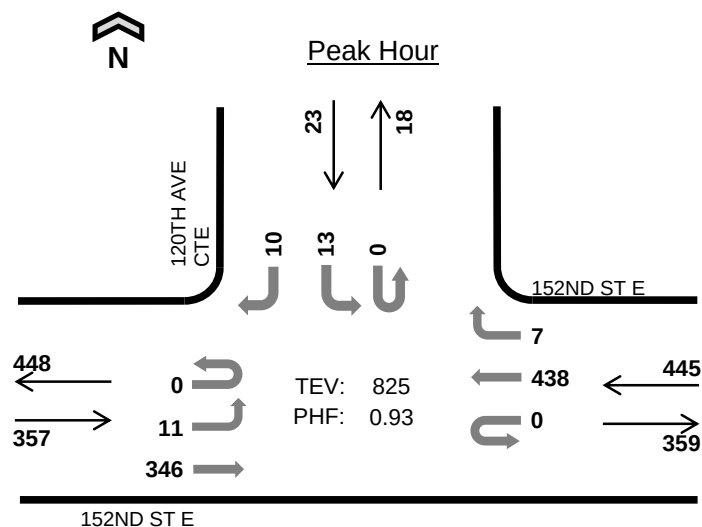
Interval Start	152ND ST E				152ND ST E				0				120TH AVE CTE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
8:00 AM	0	1	55	0	0	0	55	3	0	0	0	0	0	0	0	2	116	0
8:15 AM	0	0	56	0	0	0	62	1	0	0	0	0	0	1	0	2	122	0
8:30 AM	0	7	75	0	0	0	107	5	0	0	0	0	0	1	0	4	199	0
8:45 AM	0	4	42	0	0	0	149	4	0	0	0	0	0	1	0	14	214	651
Peak Hour	0	12	228	0	0	0	373	13	0	0	0	0	0	3	0	22	651	0

Note: For all three-hour count summary, see next page.

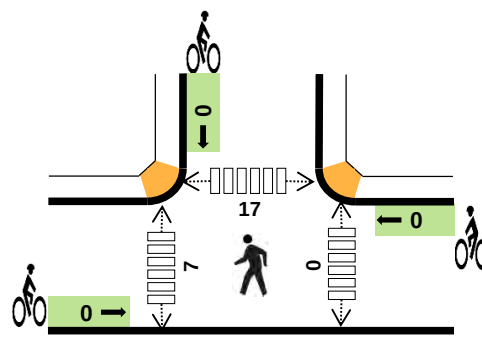
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
8:00 AM	2	2	0	0	4	0	0	0	0	0	0	0	0	0	0
8:15 AM	5	3	0	2	10	0	0	0	0	0	0	0	0	0	0
8:30 AM	4	5	0	3	12	0	0	0	0	0	0	4	4	0	8
8:45 AM	5	13	0	5	23	0	0	0	0	0	0	0	0	0	0
Peak Hour	16	23	0	10	49	0	0	0	0	0	0	4	4	0	8

Two-and-a-Half-Hour Count Summaries																		
Interval Start	152ND ST E				152ND ST E				0				120TH AVE CTE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	57	0	0	0	75	3	0	0	0	0	0	1	0	2	139	0
7:15 AM	0	5	75	0	0	0	78	2	0	0	0	0	0	1	0	7	168	0
7:30 AM	0	0	62	0	0	0	87	3	0	0	0	0	0	1	0	1	154	0
7:45 AM	0	2	54	0	0	0	96	0	0	0	0	0	0	1	0	1	154	615
8:00 AM	0	1	55	0	0	0	55	3	0	0	0	0	0	0	0	2	116	592
8:15 AM	0	0	56	0	0	0	62	1	0	0	0	0	0	1	0	2	122	546
8:30 AM	0	7	75	0	0	0	107	5	0	0	0	0	0	1	0	4	199	591
8:45 AM	0	4	42	0	0	0	149	4	0	0	0	0	0	1	0	14	214	651
9:00 AM	0	1	35	0	0	0	69	0	0	0	0	0	0	0	0	0	105	640
9:15 AM	0	0	32	0	0	0	49	0	0	0	0	0	0	0	0	1	82	600
Count Total	0	21	543	0	0	0	827	21	0	0	0	0	0	7	0	34	1,453	0
Peak Hour	0	12	228	0	0	0	373	13	0	0	0	0	0	3	0	22	651	0
Note: Two-and-a-half-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.																		
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)					Total		
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total			
7:00 AM	1	2	0	0	3	1	0	0	0	1	0	0	1	0	1			
7:15 AM	2	4	0	0	6	0	0	0	0	0	0	0	0	0	0			
7:30 AM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0			
7:45 AM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0			
8:00 AM	2	2	0	0	4	0	0	0	0	0	0	0	0	0	0			
8:15 AM	5	3	0	2	10	0	0	0	0	0	0	0	0	0	0			
8:30 AM	4	5	0	3	12	0	0	0	0	0	0	4	4	0	8			
8:45 AM	5	13	0	5	23	0	0	0	0	0	0	0	0	0	0			
9:00 AM	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1			
9:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0			
Count Total	23	31	0	10	64	1	0	0	0	1	0	4	6	0	10			
Peak Hr	16	23	0	10	49	0	0	0	0	0	0	4	4	0	8			

120TH AVE CTE 152ND ST E



Date: Tue, Oct 24, 2017
Count Period: 2:30 PM to 6:00 PM
Peak Hour: 3:00 PM to 4:00 PM



	HV %:	PHF
EB	3.4%	0.86
WB	4.0%	0.90
NB	-	-
SB	43.5%	0.44
TOTAL	4.8%	0.93

Three-and-a-Half-Hour Count Summaries

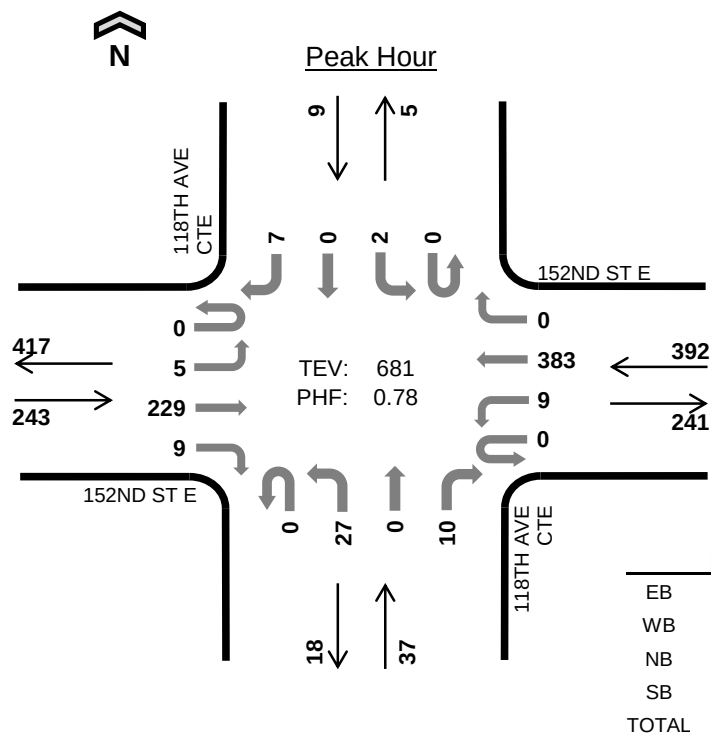
Interval Start	152ND ST E				152ND ST E				0				120TH AVE CTE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:00 PM	0	7	87	0	0	0	88	6	0	0	0	0	0	4	0	1	193	0
3:15 PM	0	0	78	0	0	0	123	1	0	0	0	0	0	7	0	6	215	0
3:30 PM	0	4	100	0	0	0	113	0	0	0	0	0	0	2	0	2	221	0
3:45 PM	0	0	81	0	0	0	114	0	0	0	0	0	0	0	0	1	196	825
Peak Hour	0	11	346	0	0	0	438	7	0	0	0	0	0	13	0	10	825	0

Note: For all three-hour count summary, see next page.

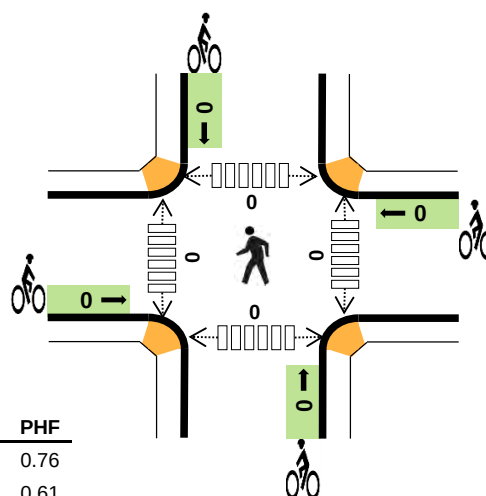
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
3:00 PM	8	3	0	3	14	0	0	0	0	0	0	1	2	0	3
3:15 PM	2	3	0	6	11	0	0	0	0	0	0	5	14	0	19
3:30 PM	2	6	0	1	9	0	0	0	0	0	0	0	1	0	1
3:45 PM	0	6	0	0	6	0	0	0	0	0	0	1	0	0	1
Peak Hour	12	18	0	10	40	0	0	0	0	0	0	7	17	0	24

Three-and-a-Half-Hour Count Summaries																		
Interval Start	152ND ST E				152ND ST E				0				120TH AVE CTE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
2:30 PM	0	1	63	0	0	0	83	2	0	0	0	0	0	0	0	0	149	0
2:45 PM	0	4	87	0	0	0	90	6	0	0	0	0	0	2	0	2	191	0
3:00 PM	0	7	87	0	0	0	88	6	0	0	0	0	0	4	0	1	193	0
3:15 PM	0	0	78	0	0	0	123	1	0	0	0	0	0	7	0	6	215	748
3:30 PM	0	4	100	0	0	0	113	0	0	0	0	0	0	2	0	2	221	820
3:45 PM	0	0	81	0	0	0	114	0	0	0	0	0	0	0	0	1	196	825
4:00 PM	0	2	88	0	0	0	85	4	0	0	0	0	0	0	0	1	180	812
4:15 PM	0	2	77	0	0	0	88	1	0	0	0	0	0	2	0	0	170	767
4:30 PM	0	2	94	0	0	0	105	1	0	0	0	0	0	2	0	2	206	752
4:45 PM	0	4	87	0	0	0	110	3	0	0	0	0	0	2	0	2	208	764
5:00 PM	0	2	99	0	0	0	99	3	0	0	0	0	0	1	0	2	206	790
5:15 PM	0	2	80	0	0	0	91	2	0	0	0	0	0	0	0	1	176	796
5:30 PM	0	5	98	0	0	0	105	1	0	0	0	0	0	3	0	4	216	806
5:45 PM	0	1	65	0	0	0	113	2	0	0	0	0	0	1	0	2	184	782
Count Total	0	36	1,184	0	0	0	1,407	32	0	0	0	0	0	26	0	26	2,711	0
Peak Hour	0	11	346	0	0	0	438	7	0	0	0	0	0	13	0	10	825	0
Note: Three-and-a-half-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.																		
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)					Total		
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South				
2:30 PM	2	2	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	
2:45 PM	4	6	0	0	10	0	1	0	0	1	1	6	1	0	8			
3:00 PM	8	3	0	3	14	0	0	0	0	0	0	1	2	0	3			
3:15 PM	2	3	0	6	11	0	0	0	0	0	0	5	14	0	19			
3:30 PM	2	6	0	1	9	0	0	0	0	0	0	0	1	0	1			
3:45 PM	0	6	0	0	6	0	0	0	0	0	0	1	0	0	1			
4:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0			
4:15 PM	2	0	0	0	2	0	0	0	0	0	0	0	1	0	1			
4:30 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0			
4:45 PM	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0			
5:00 PM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0			
5:15 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0			
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
5:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	2	0	2			
Count Total	26	31	0	10	67	0	1	0	0	1	1	13	21	0	35			
Peak Hr	12	18	0	10	40	0	0	0	0	0	0	7	17	0	24			

118TH AVE CTE 152ND ST E



Date: Tue, Oct 24, 2017
Count Period: 7:00 AM to 9:30 AM
Peak Hour: 8:00 AM to 9:00 AM



Two-and-a-Half-Hour Count Summaries

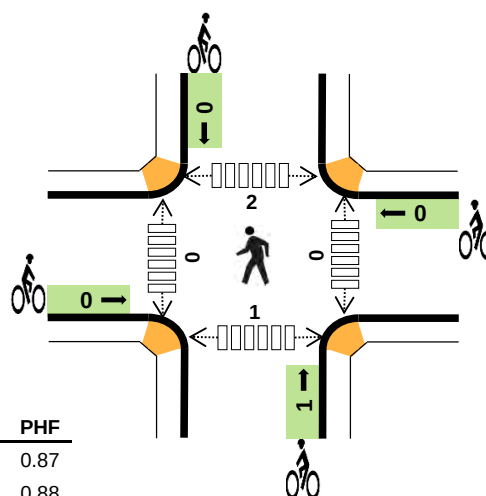
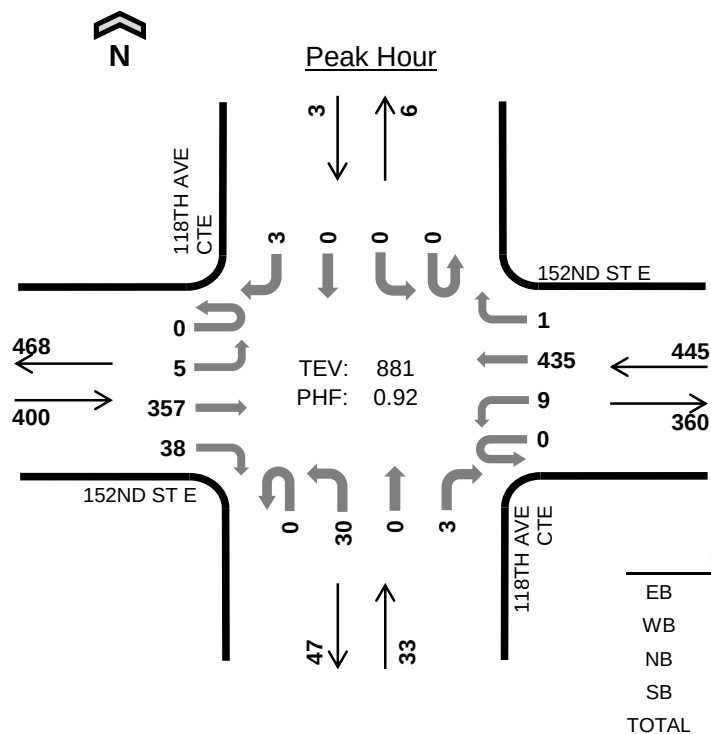
Interval Start	152ND ST E Eastbound				152ND ST E Westbound				118TH AVE CTE Northbound				118TH AVE CTE Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
8:00 AM	0	1	54	4	0	3	54	0	0	6	0	2	0	0	0	1	125	0
8:15 AM	0	1	57	2	0	0	64	0	0	9	0	2	0	0	0	1	136	0
8:30 AM	0	3	75	2	0	1	109	0	0	4	0	4	0	2	0	2	202	0
8:45 AM	0	0	43	1	0	5	156	0	0	8	0	2	0	0	0	3	218	681
Peak Hour	0	5	229	9	0	9	383	0	0	27	0	10	0	2	0	7	681	0

Note: For all three-hour count summary, see next page.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
8:00 AM	2	1	1	0	4	0	0	0	0	0	0	0	0	0	0
8:15 AM	5	3	0	0	8	0	0	0	0	0	0	0	0	0	0
8:30 AM	4	5	0	0	9	0	0	0	0	0	0	0	0	0	0
8:45 AM	5	16	0	1	22	0	0	0	0	0	0	0	0	0	0
Peak Hour	16	25	1	1	43	0	0	0	0	0	0	0	0	0	0

Two-and-a-Half-Hour Count Summaries																		
Interval Start	152ND ST E				152ND ST E				118TH AVE CTE				118TH AVE CTE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	56	3	0	0	76	0	0	8	0	2	0	0	0	0	145	0
7:15 AM	0	0	69	3	1	0	83	0	0	9	0	6	0	0	0	3	174	0
7:30 AM	0	0	56	4	0	0	91	1	0	4	0	4	0	1	0	1	162	0
7:45 AM	0	0	52	2	0	1	95	1	0	10	0	4	0	0	0	2	167	648
8:00 AM	0	1	54	4	0	3	54	0	0	6	0	2	0	0	0	1	125	628
8:15 AM	0	1	57	2	0	0	64	0	0	9	0	2	0	0	0	1	136	590
8:30 AM	0	3	75	2	0	1	109	0	0	4	0	4	0	2	0	2	202	630
8:45 AM	0	0	43	1	0	5	156	0	0	8	0	2	0	0	0	3	218	681
9:00 AM	0	1	33	1	0	1	68	1	0	7	0	1	0	1	0	0	114	670
9:15 AM	0	0	30	3	0	0	50	0	0	1	0	2	0	0	0	0	86	620
Count Total	0	6	525	25	1	11	846	3	0	66	0	29	0	4	0	13	1,529	0
Peak Hour	0	5	229	9	0	9	383	0	0	27	0	10	0	2	0	7	681	0
Note: Two-and-a-half-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.																		
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)					Total		
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total			
7:00 AM	1	1	0	0	2	1	0	0	0	1	0	0	0	0	0	0	0	0
7:15 AM	2	4	0	1	7	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	1	1	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	2	1	1	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	5	3	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	4	5	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	5	16	0	1	22	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	24	32	2	2	60	1	0	0	0	1	0	0	0	0	0	0	0	0
Peak Hour	16	25	1	1	43	0	0	0	0	0	0	0	0	0	0	0	0	0

118TH AVE CTE 152ND ST E



Three-and-a-Half-Hour Count Summaries

Interval Start	152ND ST E Eastbound				152ND ST E Westbound				118TH AVE CTE Northbound				118TH AVE CTE Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:00 PM	0	2	93	6	0	0	88	1	0	9	0	1	0	0	0	0	200	0
3:15 PM	0	1	78	10	0	3	123	0	0	6	0	1	0	0	0	2	224	0
3:30 PM	0	0	104	11	0	4	111	0	0	9	0	0	0	0	0	1	240	0
3:45 PM	0	2	82	11	0	2	113	0	0	6	0	1	0	0	0	0	217	881
Peak Hour	0	5	357	38	0	9	435	1	0	30	0	3	0	0	0	3	881	0

Note: For all three-hour count summary, see next page.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
3:00 PM	8	2	2	0	12	0	0	0	0	0	0	0	0	0	0
3:15 PM	2	5	0	0	7	0	0	1	0	1	0	0	0	0	0
3:30 PM	3	7	1	0	11	0	0	0	0	0	0	0	2	0	2
3:45 PM	0	5	0	0	5	0	0	0	0	0	0	0	0	1	1
Peak Hour	13	19	3	0	35	0	0	1	0	1	0	0	2	1	3

Three-and-a-Half-Hour Count Summaries																		
Interval Start	152ND ST E				152ND ST E				118TH AVE CTE				118TH AVE CTE				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
2:30 PM	0	1	63	7	0	2	78	0	0	5	0	0	0	0	0	0	156	0
2:45 PM	0	1	88	6	0	3	88	1	0	12	0	3	0	0	0	3	205	0
3:00 PM	0	2	93	6	0	0	88	1	0	9	0	1	0	0	0	0	200	0
3:15 PM	0	1	78	10	0	3	123	0	0	6	0	1	0	0	0	2	224	785
3:30 PM	0	0	104	11	0	4	111	0	0	9	0	0	0	0	0	1	240	869
3:45 PM	0	2	82	11	0	2	113	0	0	6	0	1	0	0	0	0	217	881
4:00 PM	0	0	90	8	0	0	83	0	0	3	0	1	0	0	0	1	186	867
4:15 PM	0	0	80	11	0	0	89	0	0	6	0	0	0	0	0	1	187	830
4:30 PM	0	4	92	10	0	0	102	3	0	5	0	1	0	1	0	0	218	808
4:45 PM	0	2	89	8	0	1	112	0	0	4	0	2	0	0	0	4	222	813
5:00 PM	0	0	100	19	0	2	97	0	0	6	0	2	0	0	0	2	228	855
5:15 PM	0	0	77	13	0	1	93	0	0	10	0	2	0	0	0	1	197	865
5:30 PM	0	1	102	8	0	4	105	0	0	3	0	1	0	0	0	2	226	873
5:45 PM	0	2	66	6	0	0	110	0	0	7	0	2	0	0	0	0	193	844
Count Total	0	16	1,204	134	0	22	1,392	5	0	91	0	17	0	1	0	17	2,899	0
Peak Hour	0	5	357	38	0	9	435	1	0	30	0	3	0	0	0	3	881	0
Note: Three-and-a-half-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.																		
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)					Total		
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South				
2:30 PM	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	
2:45 PM	5	5	0	0	10	0	0	0	0	0	0	0	0	2	1	3	3	
3:00 PM	8	2	2	0	12	0	0	0	0	0	0	0	0	0	0	0	0	
3:15 PM	2	5	0	0	7	0	0	1	0	1	0	0	0	0	0	0	0	
3:30 PM	3	7	1	0	11	0	0	0	0	0	0	0	0	2	0	2	2	
3:45 PM	0	5	0	0	5	0	0	0	0	0	0	0	0	0	1	1	1	
4:00 PM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 PM	2	0	0	0	2	0	0	0	0	0	0	0	0	1	0	1	1	
4:30 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	1	2	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	
5:00 PM	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	
5:15 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	
5:30 PM	0	0	0	0	0	0	0	2	0	2	1	0	0	0	0	1	1	
5:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	2	0	0	2	2	
Count Total	28	30	4	1	63	0	0	3	0	3	1	0	7	2	10	10	10	
Peak Hour	13	19	3	0	35	0	0	1	0	1	0	0	2	1	3	3	3	

Location: NORTH ENTRY W/O 122ND AVE E
 Date Range: 10/24/2017 - 10/30/2017
 Site Code: A

Time	Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Mid-Week Average		
	10/24/2017			10/25/2017			10/26/2017			10/27/2017			10/28/2017			10/29/2017			10/30/2017					
	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	0	0	0	0	0	0	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
4:00 AM	0	0	0	0	0	0	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
5:00 AM	0	1	1	0	1	1	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
6:00 AM	0	1	1	0	2	2	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
7:00 AM	1	10	11	1	13	14	0	9	9	-	-	-	-	-	-	-	-	-	-	-	-	1	11	11
8:00 AM	18	73	91	16	59	75	24	78	102	-	-	-	-	-	-	-	-	-	-	-	-	19	70	89
9:00 AM	8	5	13	5	4	9	5	5	10	-	-	-	-	-	-	-	-	-	-	-	-	6	5	11
10:00 AM	1	3	4	2	4	6	1	3	4	-	-	-	-	-	-	-	-	-	-	-	-	1	3	5
11:00 AM	9	2	11	4	7	11	4	5	9	-	-	-	-	-	-	-	-	-	-	-	-	6	5	10
12:00 PM	3	3	6	2	2	4	7	6	13	-	-	-	-	-	-	-	-	-	-	-	-	4	4	8
1:00 PM	1	7	8	1	6	7	4	5	9	-	-	-	-	-	-	-	-	-	-	-	-	2	6	8
2:00 PM	7	21	28	4	21	25	3	15	18	-	-	-	-	-	-	-	-	-	-	-	-	5	19	24
3:00 PM	30	23	53	27	20	47	22	25	47	-	-	-	-	-	-	-	-	-	-	-	-	26	23	49
4:00 PM	0	6	6	2	4	6	1	14	15	-	-	-	-	-	-	-	-	-	-	-	-	1	8	9
5:00 PM	0	0	0	0	1	1	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	0	0	1
6:00 PM	1	2	3	0	1	1	0	4	4	-	-	-	-	-	-	-	-	-	-	-	-	0	2	3
7:00 PM	1	0	1	0	1	1	0	2	2	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
8:00 PM	0	0	0	1	0	1	2	0	2	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1
9:00 PM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
10:00 PM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Total	80	157	237	65	146	211	76	173	249	-	-	-	-	-	-	-	-	-	-	-	-	74	159	232
Percent	34%	66%	-	31%	69%	-	31%	69%	-	-	-	-	-	-	-	-	-	-	-	-	-	32%	68%	-

1. Mid-week average includes data between Tuesday and Thursday.

Location: SOUTH EXIT N/O 152ND ST E
 Date Range: 10/24/2017 - 10/30/2017
 Site Code: B

Time	Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Mid-Week Average		
	10/24/2017			10/25/2017			10/26/2017			10/27/2017			10/28/2017			10/29/2017			10/30/2017					
	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	0	0	0	0	0	0	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
1:00 AM	0	0	0	1	2	3	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
2:00 AM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
4:00 AM	0	0	0	0	0	0	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
6:00 AM	2	0	2	1	0	1	3	0	3	-	-	-	-	-	-	-	-	-	-	-	-	2	0	2
7:00 AM	22	1	23	33	13	46	15	1	16	-	-	-	-	-	-	-	-	-	-	-	-	23	5	28
8:00 AM	108	127	235	96	126	222	110	125	235	-	-	-	-	-	-	-	-	-	-	-	-	105	126	231
9:00 AM	6	12	18	8	8	16	10	12	22	-	-	-	-	-	-	-	-	-	-	-	-	8	11	19
10:00 AM	4	4	8	7	2	9	10	12	22	-	-	-	-	-	-	-	-	-	-	-	-	7	6	13
11:00 AM	7	7	14	6	12	18	9	11	20	-	-	-	-	-	-	-	-	-	-	-	-	7	10	17
12:00 PM	4	4	8	3	6	9	13	16	29	-	-	-	-	-	-	-	-	-	-	-	-	7	9	15
1:00 PM	5	7	12	2	5	7	5	5	10	-	-	-	-	-	-	-	-	-	-	-	-	4	6	10
2:00 PM	33	10	43	26	12	38	25	8	33	-	-	-	-	-	-	-	-	-	-	-	-	28	10	38
3:00 PM	29	75	104	42	83	125	36	87	123	-	-	-	-	-	-	-	-	-	-	-	-	36	82	117
4:00 PM	6	21	27	0	25	25	13	41	54	-	-	-	-	-	-	-	-	-	-	-	-	6	29	35
5:00 PM	2	10	12	0	6	6	3	12	15	-	-	-	-	-	-	-	-	-	-	-	-	2	9	11
6:00 PM	0	1	1	0	4	4	5	3	8	-	-	-	-	-	-	-	-	-	-	-	-	2	3	4
7:00 PM	2	1	3	1	2	3	4	4	8	-	-	-	-	-	-	-	-	-	-	-	-	2	2	5
8:00 PM	1	0	1	1	0	1	1	11	12	-	-	-	-	-	-	-	-	-	-	-	-	1	4	5
9:00 PM	0	0	0	2	0	2	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1
10:00 PM	0	0	0	0	1	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
11:00 PM	0	2	2	0	2	2	0	2	2	-	-	-	-	-	-	-	-	-	-	-	-	0	2	2
Total	231	282	513	229	309	538	264	351	615	-	-	-	-	-	-	-	-	-	-	-	-	241	314	555
Percent	45%	55%	-	43%	57%	-	43%	57%	-	-	-	-	-	-	-	-	-	-	-	-	-	43%	57%	-

1. Mid-week average includes data between Tuesday and Thursday.

Location: 120TH AVE CT E N/O 152ND ST E
 Date Range: 10/24/2017 - 10/30/2017
 Site Code: C

Time	Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Mid-Week Average		
	10/24/2017			10/25/2017			10/26/2017			10/27/2017			10/28/2017			10/29/2017			10/30/2017					
	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total	NB	SB	Total
12:00 AM	1	0	1	0	2	2	2	0	2	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2
1:00 AM	1	2	3	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	0	1	1	
2:00 AM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	0	0	0	
3:00 AM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	0	0	0	
4:00 AM	1	2	3	0	1	1	2	2	4	-	-	-	-	-	-	-	-	-	-	-	1	2	3	
5:00 AM	1	4	5	2	4	6	1	5	6	-	-	-	-	-	-	-	-	-	-	-	1	4	6	
6:00 AM	27	28	55	25	25	50	26	25	51	-	-	-	-	-	-	-	-	-	-	-	26	26	52	
7:00 AM	16	15	31	11	13	24	10	10	20	-	-	-	-	-	-	-	-	-	-	-	12	13	25	
8:00 AM	24	27	51	23	25	48	30	28	58	-	-	-	-	-	-	-	-	-	-	-	26	27	52	
9:00 AM	4	2	6	3	1	4	7	4	11	-	-	-	-	-	-	-	-	-	-	-	5	2	7	
10:00 AM	2	3	5	2	2	4	8	5	13	-	-	-	-	-	-	-	-	-	-	-	4	3	7	
11:00 AM	4	3	7	4	6	10	4	7	11	-	-	-	-	-	-	-	-	-	-	-	4	5	9	
12:00 PM	4	4	8	3	1	4	1	10	11	-	-	-	-	-	-	-	-	-	-	-	3	5	8	
1:00 PM	2	2	4	2	2	4	4	2	6	-	-	-	-	-	-	-	-	-	-	-	3	2	5	
2:00 PM	12	5	17	15	11	26	17	10	27	-	-	-	-	-	-	-	-	-	-	-	15	9	23	
3:00 PM	21	25	46	18	19	37	24	31	55	-	-	-	-	-	-	-	-	-	-	-	21	25	46	
4:00 PM	19	11	30	9	7	16	26	14	40	-	-	-	-	-	-	-	-	-	-	-	18	11	29	
5:00 PM	18	14	32	23	17	40	24	13	37	-	-	-	-	-	-	-	-	-	-	-	22	15	36	
6:00 PM	14	21	35	11	21	32	12	29	41	-	-	-	-	-	-	-	-	-	-	-	12	24	36	
7:00 PM	3	0	3	4	1	5	1	1	2	-	-	-	-	-	-	-	-	-	-	-	3	1	3	
8:00 PM	5	4	9	5	4	9	3	1	4	-	-	-	-	-	-	-	-	-	-	-	4	3	7	
9:00 PM	0	0	0	2	3	5	1	1	2	-	-	-	-	-	-	-	-	-	-	-	1	1	2	
10:00 PM	3	0	3	1	1	2	1	0	1	-	-	-	-	-	-	-	-	-	-	-	2	0	2	
11:00 PM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	0	0	0	
Total	182	172	354	163	166	329	204	198	402	-	-	-	-	-	-	-	-	-	-	-	183	179	362	
Percent	51%	49%	-	50%	50%	-	51%	49%	-	-	-	-	-	-	-	-	-	-	-	-	51%	49%	-	

1. Mid-week average includes data between Tuesday and Thursday.

Location: 150TH ST CT E W/O 120TH AVE CT E
 Date Range: 10/24/2017 - 10/30/2017
 Site Code: D

Time	Tuesday			Wednesday			Thursday			Friday			Saturday			Sunday			Monday			Mid-Week Average		
	10/24/2017			10/25/2017			10/26/2017			10/27/2017			10/28/2017			10/29/2017			10/30/2017					
	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total	EB	WB	Total
12:00 AM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
1:00 AM	1	0	1	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
4:00 AM	1	1	2	0	0	0	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
5:00 AM	0	0	0	0	1	1	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
6:00 AM	0	2	2	1	1	2	0	3	3	-	-	-	-	-	-	-	-	-	-	-	-	0	2	2
7:00 AM	1	2	3	2	4	6	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	1	3	4
8:00 AM	3	1	4	2	1	3	5	3	8	-	-	-	-	-	-	-	-	-	-	-	-	3	2	5
9:00 AM	0	2	2	1	2	3	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	1	2
10:00 AM	0	0	0	0	1	1	0	2	2	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
11:00 AM	1	3	4	4	4	8	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	2	3	5
12:00 PM	2	0	2	0	2	2	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2
1:00 PM	0	0	0	1	2	3	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2
2:00 PM	0	1	1	3	1	4	3	1	4	-	-	-	-	-	-	-	-	-	-	-	-	2	1	3
3:00 PM	2	4	6	1	1	2	0	2	2	-	-	-	-	-	-	-	-	-	-	-	-	1	2	3
4:00 PM	4	3	7	2	4	6	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	2	3	5
5:00 PM	0	2	2	2	1	3	0	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1	1	2
6:00 PM	0	1	1	0	0	0	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	0	1	1
7:00 PM	0	0	0	0	1	1	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
8:00 PM	1	1	2	1	0	1	1	0	1	-	-	-	-	-	-	-	-	-	-	-	-	1	0	1
9:00 PM	0	0	0	1	1	2	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	1
10:00 PM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
11:00 PM	0	0	0	0	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Total	16	23	39	21	27	48	14	21	35	-	-	-	-	-	-	-	-	-	-	-	-	17	24	41
Percent	41%	59%	-	44%	56%	-	40%	60%	-	-	-	-	-	-	-	-	-	-	-	-	-	42%	58%	-

1. Mid-week average includes data between Tuesday and Thursday.

APPENDIX B

Level of Service Definitions



Levels of service (LOS) are qualitative descriptions of traffic operating conditions. These levels of service are designated with letters ranging from LOS A, which is indicative of good operating conditions with little or no delay, to LOS F, which is indicative of stop-and-go conditions with frequent and lengthy delays. Levels of service for this analysis were developed using procedures presented in the *Highway Capacity Manual, 6th Edition* (Transportation Research Board, 2016).

Level of service for signalized intersections is defined in terms of delay. Delay can be a cause of driver discomfort, frustration, inefficient fuel consumption, and lost travel time. Specifically, level-of-service criteria are stated in terms of the average delay per vehicle in seconds. Delay is a complex measure and is dependent on a number of variables including: the quality of progression, cycle length, green ratio, and a volume-to-capacity ratio for the lane group or approach in question. Table A-1 shows the level of service criteria for signalized intersections from the *Highway Capacity Manual, 6th Edition*.

Table A-1. Level of Service for Signalized Intersections

Level of Service	Average Delay Per Vehicle	General Description
A	Less than 10.0 Seconds	Free flow
B	10.1 to 20.0 seconds	Stable flow (slight delays)
C	20.1 to 35.0 seconds	Stable flow (acceptable delays)
D	35.1 to 55.0 seconds	Approaching unstable flow (tolerable delay—occasionally wait through more than one signal cycle before proceeding.
E	55.1 to 80.0 seconds	Unstable flow (approaching capacity)
F	Greater than 80.0 seconds	Forced flow (jammed)

Source: Transportation Research Board, *Highway Capacity Manual*, 2016.

For unsignalized intersections, level of service is based on the average delay per vehicle for each turning movement. The level of service for a two-way, stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. Delay is related to the availability of gaps in the main street's traffic flow, and the ability of a driver to enter or pass through those gaps. Table A-2 shows the level of service criteria for unsignalized intersections from the *Highway Capacity Manual, 6th Edition*.

Table A-2. Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Delay (seconds per vehicle)
A	Less than 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	Greater than 50.0

Source: Transportation Research Board, *Highway Capacity Manual*, 2016.



APPENDIX C

Level of Service Calculation Sheets



PSD Pope Elementary
2: 122nd Ave E & 152nd St E

Existing (2017) Morning
HCM 6th Signalized Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	157	93	220	580	258	143
Future Volume (veh/h)	157	93	220	580	258	143
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1811	1811	1811	1811
Adj Flow Rate, veh/h	180	107	253	667	297	164
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	5	5	6	6	6	6
Cap, veh/h	281	250	602	993	495	419
Arrive On Green	0.16	0.16	0.14	0.55	0.27	0.27
Sat Flow, veh/h	1739	1547	1725	1811	1811	1535
Grp Volume(v), veh/h	180	107	253	667	297	164
Grp Sat Flow(s),veh/h/ln	1739	1547	1725	1811	1811	1535
Q Serve(g_s), s	2.8	1.8	2.6	7.7	4.2	2.5
Cycle Q Clear(g_c), s	2.8	1.8	2.6	7.7	4.2	2.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	281	250	602	993	495	419
V/C Ratio(X)	0.64	0.43	0.42	0.67	0.60	0.39
Avail Cap(c_a), veh/h	1248	1110	717	1887	1268	1075
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	11.1	5.5	4.7	9.2	8.7
Incr Delay (d2), s/veh	0.9	0.4	0.2	0.3	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.5	0.4	0.9	1.1	0.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.4	11.5	5.7	5.0	9.7	8.9
LnGrp LOS	B	B	A	A	A	A
Approach Vol, veh/h	287			920	461	
Approach Delay, s/veh	12.1			5.2	9.4	
Approach LOS	B			A	A	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	8.0	12.5			20.5	8.7
Change Period (Y+Rc), s	4.0	4.5			4.5	4.0
Max Green Setting (Gmax), s	6.0	20.5			30.5	21.0
Max Q Clear Time (g_c+I1), s	4.6	6.2			9.7	4.8
Green Ext Time (p_c), s	0.0	1.3			3.0	0.4

Intersection Summary

HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

PSD Pope Elementary
3: 121st Ave St E/Pope Dwy & 152nd St E

Existing (2017) Morning
HCM 6th TWSC

Intersection												
Int Delay, s/veh	5.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕		↕	↕	
Traffic Vol, veh/h	53	177	2	0	310	53	3	5	13	60	4	76
Future Vol, veh/h	53	177	2	0	310	53	3	5	13	60	4	76
Conflicting Peds, #/hr	0	0	0	0	0	0	41	0	0	0	0	41
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	68	68	68	66	66	66	56	56	56
Heavy Vehicles, %	0	7	7	7	7	0	5	5	5	0	0	0
Mvmt Flow	70	233	3	0	456	78	5	8	20	107	7	136

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	534	0	0	236	0	0	983	909	235	884	871	536
Stage 1	-	-	-	-	-	-	375	375	-	495	495	-
Stage 2	-	-	-	-	-	-	608	534	-	389	376	-
Critical Hdwy	4.1	-	-	4.17	-	-	7.15	6.55	6.25	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.263	-	-	3.545	4.045	3.345	3.5	4	3.3
Pot Cap-1 Maneuver	1044	-	-	1302	-	-	225	272	797	268	291	549
Stage 1	-	-	-	-	-	-	640	612	-	560	549	-
Stage 2	-	-	-	-	-	-	478	520	-	639	620	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1044	-	-	1302	-	-	148	251	797	240	269	528
Mov Cap-2 Maneuver	-	-	-	-	-	-	148	251	-	240	269	-
Stage 1	-	-	-	-	-	-	591	565	-	517	549	-
Stage 2	-	-	-	-	-	-	337	520	-	568	572	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	2			0			15.6			22.1		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	372	1044	-	-	1302	-	-	240	504
HCM Lane V/C Ratio	0.086	0.067	-	-	-	-	-	0.446	0.283
HCM Control Delay (s)	15.6	8.7	0	-	0	-	-	31.6	14.9
HCM Lane LOS	C	A	A	-	A	-	-	D	B
HCM 95th %tile Q(veh)	0.3	0.2	-	-	0	-	-	2.1	1.2

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	229	376	13	3	22
Future Vol, veh/h	12	229	376	13	3	22
Conflicting Peds, #/hr	4	0	0	4	0	4
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	73	73	63	63	42	42
Heavy Vehicles, %	33	5	5	46	40	40
Mvmt Flow	16	314	597	21	7	52

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	622	0	958
Stage 1	-	-	612
Stage 2	-	-	346
Critical Hdwy	4.43	-	6.8
Critical Hdwy Stg 1	-	-	5.8
Critical Hdwy Stg 2	-	-	5.8
Follow-up Hdwy	2.497	-	3.86
Pot Cap-1 Maneuver	826	-	244
Stage 1	-	-	474
Stage 2	-	-	639
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	823	-	236
Mov Cap-2 Maneuver	-	-	236
Stage 1	-	-	461
Stage 2	-	-	636

Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	16
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	823	-	-	-	388
HCM Lane V/C Ratio	0.02	-	-	-	0.153
HCM Control Delay (s)	9.5	0	-	-	16
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.5

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	229	9	9	389	0	27	0	10	2	0	7
Future Vol, veh/h	5	229	9	9	389	0	27	0	10	2	0	7
Conflicting Peds, #/hr	0	0	0	0	0	0	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	76	76	76	61	61	61	84	84	84	56	56	56
Heavy Vehicles, %	7	7	7	6	6	6	3	3	3	11	11	11
Mvmt Flow	7	301	12	15	638	0	32	0	12	4	0	13
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	638	0	0	313	0	0	996	989	307	995	995	638
Stage 1	-	-	-	-	-	-	321	321	-	668	668	-
Stage 2	-	-	-	-	-	-	675	668	-	327	327	-
Critical Hdwy	4.17	-	-	4.16	-	-	7.13	6.53	6.23	7.21	6.61	6.31
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.21	5.61	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.21	5.61	-
Follow-up Hdwy	2.263	-	-	2.254	-	-	3.527	4.027	3.327	3.599	4.099	3.399
Pot Cap-1 Maneuver	922	-	-	1225	-	-	222	246	731	215	236	461
Stage 1	-	-	-	-	-	-	689	650	-	433	443	-
Stage 2	-	-	-	-	-	-	442	455	-	667	632	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	922	-	-	1225	-	-	211	239	731	207	229	461
Mov Cap-2 Maneuver	-	-	-	-	-	-	211	239	-	207	229	-
Stage 1	-	-	-	-	-	-	683	644	-	429	435	-
Stage 2	-	-	-	-	-	-	422	446	-	650	626	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.2			21.6			15.4		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	261	922	-	-	1225	-	-	362				
HCM Lane V/C Ratio	0.169	0.007	-	-	0.012	-	-	0.044				
HCM Control Delay (s)	21.6	8.9	0	-	8	0	-	15.4				
HCM Lane LOS	C	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.1				

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	5	15	24	713	386	51
Future Vol, veh/h	5	15	24	713	386	51
Conflicting Peds, #/hr	7	0	6	0	0	6
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	33	33	82	82	89	89
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	15	45	29	870	434	57

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	1404	469	497	0	-	0
Stage 1	469	-	-	-	-	-
Stage 2	935	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	155	598	1077	-	-	-
Stage 1	634	-	-	-	-	-
Stage 2	385	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	145	595	1071	-	-	-
Mov Cap-2 Maneuver	145	-	-	-	-	-
Stage 1	597	-	-	-	-	-
Stage 2	383	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.1	0.3	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1071	-	335	-	-
HCM Lane V/C Ratio	0.027	-	0.181	-	-
HCM Control Delay (s)	8.5	0	18.1	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

PSD Pope Elementary
2: 122nd Ave E & 152nd St E

Forecast 2023 Morning WOP
HCM 6th Signalized Intersection Summary

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	205	122	288	771	344	190
Future Volume (veh/h)	205	122	288	771	344	190
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1811	1811	1811	1811
Adj Flow Rate, veh/h	236	140	331	886	395	218
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	5	5	6	6	6	6
Cap, veh/h	333	296	566	1048	556	471
Arrive On Green	0.19	0.19	0.16	0.58	0.31	0.31
Sat Flow, veh/h	1739	1547	1725	1811	1811	1535
Grp Volume(v), veh/h	236	140	331	886	395	218
Grp Sat Flow(s),veh/h/ln	1739	1547	1725	1811	1811	1535
Q Serve(g_s), s	4.7	3.0	4.2	14.9	7.1	4.2
Cycle Q Clear(g_c), s	4.7	3.0	4.2	14.9	7.1	4.2
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	333	296	566	1048	556	471
V/C Ratio(X)	0.71	0.47	0.59	0.85	0.71	0.46
Avail Cap(c_a), veh/h	989	880	705	1741	1104	935
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.0	13.3	7.0	6.4	11.3	10.3
Incr Delay (d2), s/veh	1.1	0.4	0.4	0.9	0.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.9	0.9	2.7	2.2	1.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.0	13.7	7.4	7.3	12.0	10.6
LnGrp LOS	B	B	A	A	B	B
Approach Vol, veh/h	376			1217	613	
Approach Delay, s/veh	14.5			7.3	11.5	
Approach LOS	B			A	B	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	10.0	15.8			25.9	11.1
Change Period (Y+Rc), s	4.0	4.5			4.5	4.0
Max Green Setting (Gmax), s	9.0	22.5			35.5	21.0
Max Q Clear Time (g_c+I1), s	6.2	9.1			16.9	6.7
Green Ext Time (p_c), s	0.1	1.7			4.5	0.5
Intersection Summary						
HCM 6th Ctrl Delay			9.7			
HCM 6th LOS			A			

PSD Pope Elementary
3: 121st Ave St E/Pope Dwy & 152nd St E

Forecast 2023 Morning WOP
HCM 6th TWSC

Intersection												
Int Delay, s/veh	15.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	69	236	3	0	410	68	4	9	16	75	4	97
Future Vol, veh/h	69	236	3	0	410	68	4	9	16	75	4	97
Conflicting Peds, #/hr	0	0	0	0	0	0	51	0	0	0	0	51
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	0	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	76	76	76	68	68	68	66	66	66	56	56	56
Heavy Vehicles, %	0	7	7	7	7	0	5	5	5	0	0	0
Mvmt Flow	91	311	4	0	603	100	6	14	24	134	7	173

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	703	0	0	315	0	0	1289	1198	313	1167	1150	704
Stage 1	-	-	-	-	-	-	495	495	-	653	653	-
Stage 2	-	-	-	-	-	-	794	703	-	514	497	-
Critical Hdwy	4.1	-	-	4.17	-	-	7.15	6.55	6.25	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.15	5.55	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.15	5.55	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.263	-	-	3.545	4.045	3.345	3.5	4	3.3
Pot Cap-1 Maneuver	904	-	-	1217	-	-	139	183	720	172	200	440
Stage 1	-	-	-	-	-	-	551	541	-	460	467	-
Stage 2	-	-	-	-	-	-	377	436	-	547	548	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	904	-	-	1217	-	-	68	161	720	141	176	419
Mov Cap-2 Maneuver	-	-	-	-	-	-	68	161	-	141	176	-
Stage 1	-	-	-	-	-	-	484	475	-	404	467	-
Stage 2	-	-	-	-	-	-	207	436	-	451	481	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.1	0	26.4	65.2
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	212	904	-	-	1217	-	-	141	397
HCM Lane V/C Ratio	0.207	0.1	-	-	-	-	-	0.95	0.454
HCM Control Delay (s)	26.4	9.4	0	-	0	-	-	124.3	21.4
HCM Lane LOS	D	A	A	-	A	-	-	F	C
HCM 95th %tile Q(veh)	0.8	0.3	-	-	0	-	-	6.7	2.3

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	304	498	13	4	24
Future Vol, veh/h	13	304	498	13	4	24
Conflicting Peds, #/hr	5	0	0	5	0	5
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	73	73	63	63	42	42
Heavy Vehicles, %	31	5	5	46	36	36
Mvmt Flow	18	416	790	21	10	57
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	816	0	-	0	1258	811
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	452	-
Critical Hdwy	4.41	-	-	-	6.76	6.56
Critical Hdwy Stg 1	-	-	-	-	5.76	-
Critical Hdwy Stg 2	-	-	-	-	5.76	-
Follow-up Hdwy	2.479	-	-	-	3.824	3.624
Pot Cap-1 Maneuver	699	-	-	-	161	332
Stage 1	-	-	-	-	386	-
Stage 2	-	-	-	-	575	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	696	-	-	-	154	329
Mov Cap-2 Maneuver	-	-	-	-	154	-
Stage 1	-	-	-	-	371	-
Stage 2	-	-	-	-	572	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.4	0		21.6		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	696	-	-	-	283	
HCM Lane V/C Ratio	0.026	-	-	-	0.236	
HCM Control Delay (s)	10.3	0	-	-	21.6	
HCM Lane LOS	B	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.9	

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	301	12	12	510	0	36	0	13	3	0	8
Future Vol, veh/h	5	301	12	12	510	0	36	0	13	3	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	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	76	76	76	61	61	61	84	84	84	56	56	56
Heavy Vehicles, %	7	7	7	6	6	6	3	3	3	11	11	11
Mvmt Flow	7	396	16	20	836	0	43	0	15	5	0	14
Major/Minor	Major1		Major2			Minor1			Minor2			
Conflicting Flow All	836	0	0	412	0	0	1301	1294	404	1302	1302	836
Stage 1	-	-	-	-	-	-	418	418	-	876	876	-
Stage 2	-	-	-	-	-	-	883	876	-	426	426	-
Critical Hdwy	4.17	-	-	4.16	-	-	7.13	6.53	6.23	7.21	6.61	6.31
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.21	5.61	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.21	5.61	-
Follow-up Hdwy	2.263	-	-	2.254	-	-	3.527	4.027	3.327	3.599	4.099	3.399
Pot Cap-1 Maneuver	777	-	-	1126	-	-	137	162	644	132	154	354
Stage 1	-	-	-	-	-	-	610	589	-	331	354	-
Stage 2	-	-	-	-	-	-	339	365	-	589	571	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	777	-	-	1126	-	-	127	155	644	124	147	354
Mov Cap-2 Maneuver	-	-	-	-	-	-	127	155	-	124	147	-
Stage 1	-	-	-	-	-	-	603	582	-	327	342	-
Stage 2	-	-	-	-	-	-	315	353	-	568	564	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	0.2		0.2			39.5			21.7			
HCM LOS						E			C			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	161	777	-	-	1126	-	-	235				
HCM Lane V/C Ratio	0.362	0.008	-	-	0.017	-	-	0.084				
HCM Control Delay (s)	39.5	9.7	0	-	8.3	0	-	21.7				
HCM Lane LOS	E	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	1.5	0	-	-	0.1	-	-	0.3				

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	20	29	947	514	65
Future Vol, veh/h	6	20	29	947	514	65
Conflicting Peds, #/hr	9	0	9	0	0	7
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	33	33	82	82	89	89
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	18	61	35	1155	578	73
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1858	624	660	0	-	0
Stage 1	624	-	-	-	-	-
Stage 2	1234	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	82	489	938	-	-	-
Stage 1	538	-	-	-	-	-
Stage 2	277	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	72	485	930	-	-	-
Mov Cap-2 Maneuver	72	-	-	-	-	-
Stage 1	477	-	-	-	-	-
Stage 2	275	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	32.3	0.3		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	930	-	209	-	-	
HCM Lane V/C Ratio	0.038	-	0.377	-	-	
HCM Control Delay (s)	9	0	32.3	-	-	
HCM Lane LOS	A	A	D	-	-	
HCM 95th %tile Q(veh)	0.1	-	1.6	-	-	

PSD Pope Elementary
2: 122nd Ave E & 152nd St E

Forecast 2023 Morning WProj
HCM 6th Signalized Intersection Summary

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	213	123	320	742	344	191
Future Volume (veh/h)	213	123	320	742	344	191
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1811	1811	1811	1811
Adj Flow Rate, veh/h	245	141	368	853	395	220
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	5	5	6	6	6	6
Cap, veh/h	340	303	576	1050	534	452
Arrive On Green	0.20	0.20	0.18	0.58	0.29	0.29
Sat Flow, veh/h	1739	1547	1725	1811	1811	1535
Grp Volume(v), veh/h	245	141	368	853	395	220
Grp Sat Flow(s),veh/h/ln	1739	1547	1725	1811	1811	1535
Q Serve(g_s), s	5.0	3.0	4.9	14.2	7.4	4.5
Cycle Q Clear(g_c), s	5.0	3.0	4.9	14.2	7.4	4.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	340	303	576	1050	534	452
V/C Ratio(X)	0.72	0.47	0.64	0.81	0.74	0.49
Avail Cap(c_a), veh/h	966	859	678	1700	1078	913
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.2	13.5	7.3	6.3	12.0	11.0
Incr Delay (d2), s/veh	1.1	0.4	0.9	0.6	0.8	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.9	1.1	2.6	2.4	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	15.3	13.9	8.2	6.9	12.8	11.3
LnGrp LOS	B	B	A	A	B	B
Approach Vol, veh/h	386			1221	615	
Approach Delay, s/veh	14.8			7.3	12.2	
Approach LOS	B			A	B	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	10.8	15.6			26.4	11.4
Change Period (Y+Rc), s	4.0	4.5			4.5	4.0
Max Green Setting (Gmax), s	9.0	22.5			35.5	21.0
Max Q Clear Time (g_c+I1), s	6.9	9.4			16.2	7.0
Green Ext Time (p_c), s	0.1	1.7			4.3	0.5
Intersection Summary						
HCM 6th Ctrl Delay			10.0			
HCM 6th LOS			A			

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	325	8	0	511	18	11
Future Vol, veh/h	325	8	0	511	18	11
Conflicting Peds, #/hr	0	0	0	0	41	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	20	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	76	76	68	68	66	66
Heavy Vehicles, %	7	7	7	7	5	5
Mvmt Flow	428	11	0	751	27	17
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	439	0	1226	434
Stage 1	-	-	-	-	434	-
Stage 2	-	-	-	-	792	-
Critical Hdwy	-	-	4.17	-	6.45	6.25
Critical Hdwy Stg 1	-	-	-	-	5.45	-
Critical Hdwy Stg 2	-	-	-	-	5.45	-
Follow-up Hdwy	-	-	2.263	-	3.545	3.345
Pot Cap-1 Maneuver	-	-	1095	-	194	616
Stage 1	-	-	-	-	647	-
Stage 2	-	-	-	-	441	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1095	-	186	616
Mov Cap-2 Maneuver	-	-	-	-	313	-
Stage 1	-	-	-	-	647	-
Stage 2	-	-	-	-	424	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		15.6		
HCM LOS	C					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	385	-	-	1095	-	
HCM Lane V/C Ratio	0.114	-	-	-	-	
HCM Control Delay (s)	15.6	-	-	0	-	
HCM Lane LOS	C	-	-	A	-	
HCM 95th %tile Q(veh)	0.4	-	-	0	-	

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	314	511	11	4	18
Future Vol, veh/h	9	314	511	11	4	18
Conflicting Peds, #/hr	0	0	0	0	0	0
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, %	44	5	5	55	45	45
Mvmt Flow	10	341	555	12	4	20
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	567	0	-	0	922	561
Stage 1	-	-	-	-	561	-
Stage 2	-	-	-	-	361	-
Critical Hdwy	4.54	-	-	-	6.85	6.65
Critical Hdwy Stg 1	-	-	-	-	5.85	-
Critical Hdwy Stg 2	-	-	-	-	5.85	-
Follow-up Hdwy	2.596	-	-	-	3.905	3.705
Pot Cap-1 Maneuver	826	-	-	-	252	454
Stage 1	-	-	-	-	495	-
Stage 2	-	-	-	-	620	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	826	-	-	-	248	454
Mov Cap-2 Maneuver	-	-	-	-	248	-
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	620	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		14.7		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	826	-	-	-	394	
HCM Lane V/C Ratio	0.012	-	-	-	0.061	
HCM Control Delay (s)	9.4	0	-	-	14.7	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	1	307	12	12	517	0	36	0	13	3	0	4
Future Vol, veh/h	1	307	12	12	517	0	36	0	13	3	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	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	76	76	76	61	61	61	84	84	84	56	56	56
Heavy Vehicles, %	7	7	7	6	6	6	3	3	3	11	11	11
Mvmt Flow	1	404	16	20	848	0	43	0	15	5	0	7
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	848	0	0	420	0	0	1306	1302	412	1310	1310	848
Stage 1	-	-	-	-	-	-	414	414	-	888	888	-
Stage 2	-	-	-	-	-	-	892	888	-	422	422	-
Critical Hdwy	4.17	-	-	4.16	-	-	7.13	6.53	6.23	7.21	6.61	6.31
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.21	5.61	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.21	5.61	-
Follow-up Hdwy	2.263	-	-	2.254	-	-	3.527	4.027	3.327	3.599	4.099	3.399
Pot Cap-1 Maneuver	769	-	-	1118	-	-	136	160	638	130	153	348
Stage 1	-	-	-	-	-	-	614	591	-	326	350	-
Stage 2	-	-	-	-	-	-	335	360	-	592	573	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	769	-	-	1118	-	-	130	154	638	123	147	348
Mov Cap-2 Maneuver	-	-	-	-	-	-	130	154	-	123	147	-
Stage 1	-	-	-	-	-	-	613	590	-	325	338	-
Stage 2	-	-	-	-	-	-	317	348	-	576	572	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.2			38.3			24.7		
HCM LOS							E			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	165	769	-	-	1118	-	-	195				
HCM Lane V/C Ratio	0.354	0.002	-	-	0.018	-	-	0.064				
HCM Control Delay (s)	38.3	9.7	0	-	8.3	0	-	24.7				
HCM Lane LOS	E	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	1.5	0	-	-	0.1	-	-	0.2				

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	20	0	955	515	67
Future Vol, veh/h	0	20	0	955	515	67
Conflicting Peds, #/hr	9	0	9	0	0	8
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	33	33	82	82	89	89
Heavy Vehicles, %	0	0	0	6	6	0
Mvmt Flow	0	61	0	1165	579	75
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1800	626	663	0	-	0
Stage 1	626	-	-	-	-	-
Stage 2	1174	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	89	488	935	-	-	-
Stage 1	537	-	-	-	-	-
Stage 2	296	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	87	484	927	-	-	-
Mov Cap-2 Maneuver	87	-	-	-	-	-
Stage 1	532	-	-	-	-	-
Stage 2	293	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.5	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	927	-	484	-	-	
HCM Lane V/C Ratio	-	-	0.125	-	-	
HCM Control Delay (s)	0	-	13.5	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.4	-	-	

Intersection						
Int Delay, s/veh	6.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	79	239	412	117	94	110
Future Vol, veh/h	79	239	412	117	94	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	76	76	68	68	56	56
Heavy Vehicles, %	0	7	7	0	0	0
Mvmt Flow	104	314	606	172	168	196
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	778	0	-	0	1214	692
Stage 1	-	-	-	-	692	-
Stage 2	-	-	-	-	522	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	848	-	-	-	202	447
Stage 1	-	-	-	-	500	-
Stage 2	-	-	-	-	599	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	848	-	-	-	177	447
Mov Cap-2 Maneuver	-	-	-	-	293	-
Stage 1	-	-	-	-	439	-
Stage 2	-	-	-	-	599	-
Approach	EB	WB		SB		
HCM Control Delay, s	2.4	0		25.4		
HCM LOS				D		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	848	-	-	-	293	447
HCM Lane V/C Ratio	0.123	-	-	-	0.573	0.439
HCM Control Delay (s)	9.8	-	-	-	32.6	19.2
HCM Lane LOS	A	-	-	-	D	C
HCM 95th %tile Q(veh)	0.4	-	-	-	3.3	2.2

PSD Pope Elementary
2: 122nd Ave E & 152nd St E

Existing (2017) Afternoon
HCM 6th Signalized Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	222	163	151	491	611	270
Future Volume (veh/h)	222	163	151	491	611	270
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1856	1856
Adj Flow Rate, veh/h	234	172	159	517	643	284
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	3	3
Cap, veh/h	329	293	382	1100	782	662
Arrive On Green	0.19	0.19	0.08	0.60	0.42	0.42
Sat Flow, veh/h	1753	1560	1753	1841	1856	1572
Grp Volume(v), veh/h	234	172	159	517	643	284
Grp Sat Flow(s),veh/h/ln	1753	1560	1753	1841	1856	1572
Q Serve(g_s), s	5.0	4.0	1.8	6.2	12.2	5.1
Cycle Q Clear(g_c), s	5.0	4.0	1.8	6.2	12.2	5.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	329	293	382	1100	782	662
V/C Ratio(X)	0.71	0.59	0.42	0.47	0.82	0.43
Avail Cap(c_a), veh/h	928	826	382	1416	1100	932
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.1	14.7	7.9	4.5	10.2	8.1
Incr Delay (d2), s/veh	1.1	0.7	0.3	0.1	2.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	1.2	0.4	1.1	4.0	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	16.2	15.4	8.2	4.6	12.6	8.3
LnGrp LOS	B	B	A	A	B	A
Approach Vol, veh/h	406			676	927	
Approach Delay, s/veh	15.8			5.4	11.3	
Approach LOS	B			A	B	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	7.0	21.2			28.2	11.5
Change Period (Y+Rc), s	4.0	4.5			4.5	4.0
Max Green Setting (Gmax), s	3.0	23.5			30.5	21.0
Max Q Clear Time (g_c+I1), s	3.8	14.2			8.2	7.0
Green Ext Time (p_c), s	0.0	2.5			2.2	0.6

Intersection Summary

HCM 6th Ctrl Delay	10.2
HCM 6th LOS	B

PSD Pope Elementary
3: 121st Ave St E/Pope Dwy & 152nd St E

Existing (2017) Afternoon
HCM 6th TWSC

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	24	330	16	14	385	22	6	0	13	42	4	34
Future Vol, veh/h	24	330	16	14	385	22	6	0	13	42	4	34
Conflicting Peds, #/hr	0	0	2	2	0	0	87	0	0	0	0	87
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	90	90	90	95	95	95	68	68	68	47	47	47
Heavy Vehicles, %	0	5	5	5	5	0	11	11	11	0	0	0
Mvmt Flow	27	367	18	15	405	23	9	0	19	89	9	72

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	428	0	0	387	0	0	1006	890	378	887	888	504
Stage 1	-	-	-	-	-	-	432	432	-	447	447	-
Stage 2	-	-	-	-	-	-	574	458	-	440	441	-
Critical Hdwy	4.1	-	-	4.15	-	-	7.21	6.61	6.31	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.21	5.61	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.21	5.61	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.245	-	-	3.599	4.099	3.399	3.5	4	3.3
Pot Cap-1 Maneuver	1142	-	-	1155	-	-	212	273	649	267	285	572
Stage 1	-	-	-	-	-	-	585	567	-	595	577	-
Stage 2	-	-	-	-	-	-	488	552	-	600	580	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1142	-	-	1153	-	-	158	260	648	250	271	525
Mov Cap-2 Maneuver	-	-	-	-	-	-	158	260	-	250	271	-
Stage 1	-	-	-	-	-	-	566	549	-	577	567	-
Stage 2	-	-	-	-	-	-	374	543	-	565	561	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0.3	17	27.9
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	327	1142	-	-	1153	-	-	323
HCM Lane V/C Ratio	0.085	0.023	-	-	0.013	-	-	0.527
HCM Control Delay (s)	17	8.2	0	-	8.2	0	-	27.9
HCM Lane LOS	C	A	A	-	A	A	-	D
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0	-	-	2.9

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	355	412	13	15	11
Future Vol, veh/h	15	355	412	13	15	11
Conflicting Peds, #/hr	18	0	0	18	0	12
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	88	88	86	86	50	50
Heavy Vehicles, %	33	3	3	0	38	38
Mvmt Flow	17	403	479	15	30	22
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	512	0	-	0	942	517
Stage 1	-	-	-	-	505	-
Stage 2	-	-	-	-	437	-
Critical Hdwy	4.43	-	-	-	6.78	6.58
Critical Hdwy Stg 1	-	-	-	-	5.78	-
Critical Hdwy Stg 2	-	-	-	-	5.78	-
Follow-up Hdwy	2.497	-	-	-	3.842	3.642
Pot Cap-1 Maneuver	912	-	-	-	252	493
Stage 1	-	-	-	-	539	-
Stage 2	-	-	-	-	581	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	896	-	-	-	238	479
Mov Cap-2 Maneuver	-	-	-	-	238	-
Stage 1	-	-	-	-	517	-
Stage 2	-	-	-	-	571	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.4	0		19.4		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	896	-	-	-	302	
HCM Lane V/C Ratio	0.019	-	-	-	0.172	
HCM Control Delay (s)	9.1	0	-	-	19.4	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6	

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	365	33	10	411	2	36	0	5	0	0	4
Future Vol, veh/h	4	365	33	10	411	2	36	0	5	0	0	4
Conflicting Peds, #/hr	4	0	1	1	0	4	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	87	87	87	84	84	84	68	68	100	100	50	50
Heavy Vehicles, %	5	5	5	5	5	5	7	7	7	0	0	0
Mvmt Flow	5	420	38	12	489	2	53	0	5	0	0	8
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	495	0	0	459	0	0	968	969	440	970	987	494
Stage 1	-	-	-	-	-	-	450	450	-	518	518	-
Stage 2	-	-	-	-	-	-	518	519	-	452	469	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.17	6.57	6.27	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.563	4.063	3.363	3.5	4	3.3
Pot Cap-1 Maneuver	1053	-	-	1086	-	-	228	249	607	235	249	579
Stage 1	-	-	-	-	-	-	579	563	-	544	536	-
Stage 2	-	-	-	-	-	-	531	524	-	591	564	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1049	-	-	1085	-	-	221	243	606	228	243	577
Mov Cap-2 Maneuver	-	-	-	-	-	-	221	243	-	228	243	-
Stage 1	-	-	-	-	-	-	575	559	-	539	526	-
Stage 2	-	-	-	-	-	-	516	514	-	583	560	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.2			25.4			11.3		
HCM LOS							D			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	234	1049	-	-	1085	-	-	577				
HCM Lane V/C Ratio	0.248	0.004	-	-	0.011	-	-	0.014				
HCM Control Delay (s)	25.4	8.4	0	-	8.4	0	-	11.3				
HCM Lane LOS	D	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.9	0	-	-	0	-	-	0				

Intersection

Int Delay, s/veh 1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	24	4	709	857	24
Future Vol, veh/h	8	24	4	709	857	24
Conflicting Peds, #/hr	34	0	15	0	0	15
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	40	40	92	92	92	92
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	20	60	4	771	932	26

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1773	960	973
Stage 1	960	-	-
Stage 2	813	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	92	314	717
Stage 1	375	-	-
Stage 2	440	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	89	310	707
Mov Cap-2 Maneuver	89	-	-
Stage 1	366	-	-
Stage 2	434	-	-

Approach	EB	NB	SB
HCM Control Delay, s	36.8	0.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	707	-	191	-	-
HCM Lane V/C Ratio	0.006	-	0.419	-	-
HCM Control Delay (s)	10.1	0	36.8	-	-
HCM Lane LOS	B	A	E	-	-
HCM 95th %tile Q(veh)	0	-	1.9	-	-

PSD Pope Elementary
2: 122nd Ave E & 152nd St E

Forecast (2023) Afternoon WOP
HCM 6th Signalized Intersection Summary

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	292	212	205	655	816	354
Future Volume (veh/h)	292	212	205	655	816	354
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1856	1856
Adj Flow Rate, veh/h	307	223	216	689	859	373
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	3	3
Cap, veh/h	367	326	298	1212	954	808
Arrive On Green	0.21	0.21	0.08	0.66	0.51	0.51
Sat Flow, veh/h	1753	1560	1753	1841	1856	1572
Grp Volume(v), veh/h	307	223	216	689	859	373
Grp Sat Flow(s),veh/h/ln	1753	1560	1753	1841	1856	1572
Q Serve(g_s), s	10.8	8.5	3.4	13.1	26.9	9.7
Cycle Q Clear(g_c), s	10.8	8.5	3.4	13.1	26.9	9.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	367	326	298	1212	954	808
V/C Ratio(X)	0.84	0.68	0.72	0.57	0.90	0.46
Avail Cap(c_a), veh/h	574	511	318	1449	1171	993
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	23.4	14.0	6.0	14.1	9.9
Incr Delay (d2), s/veh	3.5	0.9	6.2	0.2	7.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	3.0	2.0	3.6	11.2	2.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.8	24.4	20.2	6.1	21.6	10.1
LnGrp LOS	C	C	C	A	C	B
Approach Vol, veh/h	530			905	1232	
Approach Delay, s/veh	26.3			9.5	18.1	
Approach LOS	C			A	B	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.3	37.5			46.7	17.4
Change Period (Y+Rc), s	4.0	4.5			4.5	4.0
Max Green Setting (Gmax), s	6.0	40.5			50.5	21.0
Max Q Clear Time (g_c+I1), s	5.4	28.9			15.1	12.8
Green Ext Time (p_c), s	0.0	4.1			3.4	0.7
Intersection Summary						
HCM 6th Ctrl Delay			16.8			
HCM 6th LOS			B			

PSD Pope Elementary
3: 121st Ave St E/Pope Dwy & 152nd St E

Forecast (2023) Afternoon WOP
HCM 6th TWSC

Intersection												
Int Delay, s/veh	19.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	33	436	20	18	510	31	8	0	17	51	6	47
Future Vol, veh/h	33	436	20	18	510	31	8	0	17	51	6	47
Conflicting Peds, #/hr	0	0	2	2	0	0	108	0	0	0	0	108
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	90	90	90	95	95	95	68	68	68	47	47	47
Heavy Vehicles, %	0	4	4	5	5	0	11	11	11	0	0	0
Mvmt Flow	37	484	22	19	537	33	12	0	25	109	13	100
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	570	0	0	508	0	0	1327	1179	497	1174	1174	662
Stage 1	-	-	-	-	-	-	571	571	-	592	592	-
Stage 2	-	-	-	-	-	-	756	608	-	582	582	-
Critical Hdwy	4.1	-	-	4.15	-	-	7.21	6.61	6.31	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.21	5.61	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.21	5.61	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.245	-	-	3.599	4.099	3.399	3.5	4	3.3
Pot Cap-1 Maneuver	1013	-	-	1042	-	-	127	183	555	170	193	465
Stage 1	-	-	-	-	-	-	490	491	-	496	497	-
Stage 2	-	-	-	-	-	-	387	472	-	502	502	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1013	-	-	1040	-	-	77	169	554	153	178	417
Mov Cap-2 Maneuver	-	-	-	-	-	-	77	169	-	153	178	-
Stage 1	-	-	-	-	-	-	464	465	-	471	484	-
Stage 2	-	-	-	-	-	-	250	459	-	455	475	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.3			29.1			113.4		
HCM LOS							D			F		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	186	1013	-	-	1040	-	-	217				
HCM Lane V/C Ratio	0.198	0.036	-	-	0.018	-	-	1.02				
HCM Control Delay (s)	29.1	8.7	0	-	8.5	0	-	113.4				
HCM Lane LOS	D	A	A	-	A	A	-	F				
HCM 95th %tile Q(veh)	0.7	0.1	-	-	0.1	-	-	9.4				

PSD Pope Elementary
4: 152nd St E & 120th Ave Ct E

Forecast (2023) Afternoon WOP
HCM 6th TWSC

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	16	474	551	14	15	12
Future Vol, veh/h	16	474	551	14	15	12
Conflicting Peds, #/hr	22	0	0	22	0	15
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	88	88	86	86	50	50
Heavy Vehicles, %	31	3	3	36	37	37
Mvmt Flow	18	539	641	16	30	24
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	679	0	-	0	1246	686
Stage 1	-	-	-	-	671	-
Stage 2	-	-	-	-	575	-
Critical Hdwy	4.41	-	-	-	6.77	6.57
Critical Hdwy Stg 1	-	-	-	-	5.77	-
Critical Hdwy Stg 2	-	-	-	-	5.77	-
Follow-up Hdwy	2.479	-	-	-	3.833	3.633
Pot Cap-1 Maneuver	791	-	-	-	163	393
Stage 1	-	-	-	-	448	-
Stage 2	-	-	-	-	500	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	774	-	-	-	151	379
Mov Cap-2 Maneuver	-	-	-	-	151	-
Stage 1	-	-	-	-	424	-
Stage 2	-	-	-	-	490	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		28.6		
HCM LOS				D		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	774	-	-	-	206	
HCM Lane V/C Ratio	0.023	-	-	-	0.262	
HCM Control Delay (s)	9.8	0	-	-	28.6	
HCM Lane LOS	A	A	-	-	D	
HCM 95th %tile Q(veh)	0.1	-	-	-	1	

Intersection												
Int Delay, s/veh	3.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	5	483	44	13	547	3	48	0	7	0	0	4
Future Vol, veh/h	5	483	44	13	547	3	48	0	7	0	0	4
Conflicting Peds, #/hr	5	0	1	1	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	87	87	87	84	84	84	68	68	68	50	50	50
Heavy Vehicles, %	5	5	5	5	5	5	7	7	7	0	0	0
Mvmt Flow	6	555	51	15	651	4	71	0	10	0	0	8
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	660	0	0	607	0	0	1281	1284	582	1286	1307	658
Stage 1	-	-	-	-	-	-	594	594	-	688	688	-
Stage 2	-	-	-	-	-	-	687	690	-	598	619	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.17	6.57	6.27	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.563	4.063	3.363	3.5	4	3.3
Pot Cap-1 Maneuver	914	-	-	957	-	-	139	161	504	143	161	468
Stage 1	-	-	-	-	-	-	483	485	-	440	450	-
Stage 2	-	-	-	-	-	-	429	439	-	492	483	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	910	-	-	956	-	-	133	154	504	136	154	466
Mov Cap-2 Maneuver	-	-	-	-	-	-	133	154	-	136	154	-
Stage 1	-	-	-	-	-	-	478	480	-	433	437	-
Stage 2	-	-	-	-	-	-	411	426	-	477	478	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.2			56			12.9		
HCM LOS							F			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	147	910	-	-	956	-	-	466				
HCM Lane V/C Ratio	0.55	0.006	-	-	0.016	-	-	0.017				
HCM Control Delay (s)	56	9	0	-	8.8	0	-	12.9				
HCM Lane LOS	F	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	2.8	0	-	-	0	-	-	0.1				

PSD Pope Elementary
1: 122nd Ave E & Pope Dwy

Forecast (2023) Afternoon WOP
HCM 6th TWSC

Intersection						
Int Delay, s/veh	8.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	33	5	942	1137	30
Future Vol, veh/h	10	33	5	942	1137	30
Conflicting Peds, #/hr	42	0	19	0	0	19
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	40	40	92	92	93	93
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	25	83	5	1024	1223	32
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2334	1258	1274	0	-	0
Stage 1	1258	-	-	-	-	-
Stage 2	1076	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	41	211	552	-	-	-
Stage 1	270	-	-	-	-	-
Stage 2	330	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	39	207	542	-	-	-
Mov Cap-2 Maneuver	39	-	-	-	-	-
Stage 1	259	-	-	-	-	-
Stage 2	324	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	178.3	0.1		0		
HCM LOS	F					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	542	-	103	-	-	
HCM Lane V/C Ratio	0.01	-	1.044	-	-	
HCM Control Delay (s)	11.7	0	178.3	-	-	
HCM Lane LOS	B	A	F	-	-	
HCM 95th %tile Q(veh)	0	-	6.6	-	-	

PSD Pope Elementary
2: 122nd Ave E & 152nd St E

Forecast 2023 Afternoon WProj
HCM 6th Signalized Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	304	213	211	650	817	355
Future Volume (veh/h)	304	213	211	650	817	355
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1841	1841	1841	1841	1856	1856
Adj Flow Rate, veh/h	320	224	222	684	860	374
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	4	4	4	4	3	3
Cap, veh/h	378	336	295	1207	950	805
Arrive On Green	0.22	0.22	0.08	0.66	0.51	0.51
Sat Flow, veh/h	1753	1560	1753	1841	1856	1572
Grp Volume(v), veh/h	320	224	222	684	860	374
Grp Sat Flow(s),veh/h/ln	1753	1560	1753	1841	1856	1572
Q Serve(g_s), s	11.6	8.7	3.6	13.4	27.8	10.0
Cycle Q Clear(g_c), s	11.6	8.7	3.6	13.4	27.8	10.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	378	336	295	1207	950	805
V/C Ratio(X)	0.85	0.67	0.75	0.57	0.91	0.46
Avail Cap(c_a), veh/h	558	497	309	1410	1140	966
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	23.7	14.4	6.2	14.6	10.3
Incr Delay (d2), s/veh	5.3	0.9	8.3	0.2	8.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	3.1	2.2	3.8	11.9	3.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	30.1	24.6	22.8	6.4	23.0	10.5
LnGrp LOS	C	C	C	A	C	B
Approach Vol, veh/h	544			906	1234	
Approach Delay, s/veh	27.8			10.4	19.2	
Approach LOS	C			B	B	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.5	38.2			47.7	18.2
Change Period (Y+Rc), s	4.0	4.5			4.5	4.0
Max Green Setting (Gmax), s	6.0	40.5			50.5	21.0
Max Q Clear Time (g_c+I1), s	5.6	29.8			15.4	13.6
Green Ext Time (p_c), s	0.0	3.9			3.4	0.6
Intersection Summary						
HCM 6th Ctrl Delay			18.0			
HCM 6th LOS			B			

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	500	28	16	550	8	17
Future Vol, veh/h	500	28	16	550	8	17
Conflicting Peds, #/hr	0	3	3	0	110	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	20	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	97	97	68	68
Heavy Vehicles, %	4	4	5	5	11	11
Mvmt Flow	556	31	16	567	12	25
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	590	0	1284	575
Stage 1	-	-	-	-	575	-
Stage 2	-	-	-	-	709	-
Critical Hdwy	-	-	4.15	-	6.51	6.31
Critical Hdwy Stg 1	-	-	-	-	5.51	-
Critical Hdwy Stg 2	-	-	-	-	5.51	-
Follow-up Hdwy	-	-	2.245	-	3.599	3.399
Pot Cap-1 Maneuver	-	-	971	-	174	501
Stage 1	-	-	-	-	545	-
Stage 2	-	-	-	-	472	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	968	-	153	500
Mov Cap-2 Maneuver	-	-	-	-	279	-
Stage 1	-	-	-	-	534	-
Stage 2	-	-	-	-	422	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.2		14.9	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	399	-	-	968	-	
HCM Lane V/C Ratio	0.092	-	-	0.017	-	
HCM Control Delay (s)	14.9	-	-	8.8	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.3	-	-	0.1	-	

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	11	485	559	12	11	10
Future Vol, veh/h	11	485	559	12	11	10
Conflicting Peds, #/hr	23	0	0	23	0	15
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	88	88	86	86	50	50
Heavy Vehicles, %	45	3	3	42	45	45
Mvmt Flow	13	551	650	14	22	20
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	687	0	-	0	1257	695
Stage 1	-	-	-	-	680	-
Stage 2	-	-	-	-	577	-
Critical Hdwy	4.55	-	-	-	6.85	6.65
Critical Hdwy Stg 1	-	-	-	-	5.85	-
Critical Hdwy Stg 2	-	-	-	-	5.85	-
Follow-up Hdwy	2.605	-	-	-	3.905	3.705
Pot Cap-1 Maneuver	736	-	-	-	154	377
Stage 1	-	-	-	-	432	-
Stage 2	-	-	-	-	486	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	720	-	-	-	144	363
Mov Cap-2 Maneuver	-	-	-	-	144	-
Stage 1	-	-	-	-	412	-
Stage 2	-	-	-	-	475	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.2	0		27.4		
HCM LOS				D		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	720	-	-	-	202	
HCM Lane V/C Ratio	0.017	-	-	-	0.208	
HCM Control Delay (s)	10.1	0	-	-	27.4	
HCM Lane LOS	B	A	-	-	D	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8	

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	1	489	44	13	553	3	48	0	7	0	0	0
Future Vol, veh/h	1	489	44	13	553	3	48	0	7	0	0	0
Conflicting Peds, #/hr	5	0	1	1	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	87	87	87	84	84	84	68	68	68	50	50	50
Heavy Vehicles, %	5	5	5	5	5	5	7	7	7	0	0	0
Mvmt Flow	1	562	51	15	658	4	71	0	10	0	0	0
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	667	0	0	614	0	0	1281	1288	589	1290	1311	665
Stage 1	-	-	-	-	-	-	591	591	-	695	695	-
Stage 2	-	-	-	-	-	-	690	697	-	595	616	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.17	6.57	6.27	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.563	4.063	3.363	3.5	4	3.3
Pot Cap-1 Maneuver	909	-	-	951	-	-	139	160	499	142	160	464
Stage 1	-	-	-	-	-	-	485	487	-	436	447	-
Stage 2	-	-	-	-	-	-	427	435	-	494	485	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	905	-	-	950	-	-	136	155	499	136	155	462
Mov Cap-2 Maneuver	-	-	-	-	-	-	136	155	-	136	155	-
Stage 1	-	-	-	-	-	-	484	486	-	433	434	-
Stage 2	-	-	-	-	-	-	416	422	-	483	484	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.2			54.1			0		
HCM LOS							F			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	150	905	-	-	950	-	-	-				
HCM Lane V/C Ratio	0.539	0.001	-	-	0.016	-	-	-				
HCM Control Delay (s)	54.1	9	0	-	8.9	0	-	0				
HCM Lane LOS	F	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	2.7	0	-	-	0.1	-	-	-				

Intersection						
Int Delay, s/veh	1.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	34	0	954	1138	30
Future Vol, veh/h	0	34	0	954	1138	30
Conflicting Peds, #/hr	43	0	19	0	0	19
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	40	40	92	92	93	93
Heavy Vehicles, %	0	0	0	4	3	0
Mvmt Flow	0	85	0	1037	1224	32
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2339	1259	1275	0	-	0
Stage 1	1259	-	-	-	-	-
Stage 2	1080	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	41	210	551	-	-	-
Stage 1	270	-	-	-	-	-
Stage 2	329	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	40	206	541	-	-	-
Mov Cap-2 Maneuver	40	-	-	-	-	-
Stage 1	265	-	-	-	-	-
Stage 2	323	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	34.2	0		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	541	-	206	-	-	
HCM Lane V/C Ratio	-	-	0.413	-	-	
HCM Control Delay (s)	0	-	34.2	-	-	
HCM Lane LOS	A	-	D	-	-	
HCM 95th %tile Q(veh)	0	-	1.9	-	-	

Intersection						
Int Delay, s/veh	4.6					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	47	449	516	42	79	55
Future Vol, veh/h	47	449	516	42	79	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	95	95	47	47
Heavy Vehicles, %	0	4	5	0	0	0
Mvmt Flow	52	499	543	44	168	117
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	587	0	-	0	1168	565
Stage 1	-	-	-	-	565	-
Stage 2	-	-	-	-	603	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	998	-	-	-	216	528
Stage 1	-	-	-	-	573	-
Stage 2	-	-	-	-	550	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	998	-	-	-	205	528
Mov Cap-2 Maneuver	-	-	-	-	330	-
Stage 1	-	-	-	-	543	-
Stage 2	-	-	-	-	550	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.8	0		21.4		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	998	-	-	-	330	528
HCM Lane V/C Ratio	0.052	-	-	-	0.509	0.222
HCM Control Delay (s)	8.8	-	-	-	26.7	13.7
HCM Lane LOS	A	-	-	-	D	B
HCM 95th %tile Q(veh)	0.2	-	-	-	2.7	0.8

PSD Pope Elementary
2: 122nd Ave E & 152nd St E

Existing (2017) PM Peak
HCM 6th Signalized Intersection Summary

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	185	186	124	463	783	297
Future Volume (veh/h)	185	186	124	463	783	297
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	195	196	131	487	824	313
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	302	269	323	1236	967	820
Arrive On Green	0.17	0.17	0.06	0.66	0.51	0.51
Sat Flow, veh/h	1795	1598	1795	1885	1885	1598
Grp Volume(v), veh/h	195	196	131	487	824	313
Grp Sat Flow(s),veh/h/ln	1795	1598	1795	1885	1885	1598
Q Serve(g_s), s	4.9	5.6	1.5	5.8	18.2	5.7
Cycle Q Clear(g_c), s	4.9	5.6	1.5	5.8	18.2	5.7
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	302	269	323	1236	967	820
V/C Ratio(X)	0.65	0.73	0.41	0.39	0.85	0.38
Avail Cap(c_a), veh/h	782	696	328	1779	1505	1276
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.7	19.0	9.6	3.9	10.2	7.1
Incr Delay (d2), s/veh	0.9	1.4	0.3	0.1	1.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	1.9	0.5	1.2	5.8	1.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.6	20.4	9.9	3.9	11.9	7.2
LnGrp LOS	B	C	A	A	B	A
Approach Vol, veh/h	391			618	1137	
Approach Delay, s/veh	20.0			5.2	10.6	
Approach LOS	C			A	B	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	6.9	29.2			36.1	12.1
Change Period (Y+Rc), s	4.0	4.5			4.5	4.0
Max Green Setting (Gmax), s	3.0	38.5			45.5	21.0
Max Q Clear Time (g_c+I1), s	3.5	20.2			7.8	7.6
Green Ext Time (p_c), s	0.0	4.5			2.1	0.5
Intersection Summary						
HCM 6th Ctrl Delay			10.8			
HCM 6th LOS			B			

PSD Pope Elementary
3: 121st Ave St E/Pope Dwy & 152nd St E

Existing (2017) PM Peak
HCM 6th TWSC

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	358	9	13	406	2	5	0	8	5	0	4
Future Vol, veh/h	1	358	9	13	406	2	5	0	8	5	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	3	0	0	0	0	3
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	94	94	94	92	92	92	65	65	65	38	38	38
Heavy Vehicles, %	0	1	1	1	1	0	0	0	0	0	0	0
Mvmt Flow	1	381	10	14	441	2	8	0	12	13	0	11
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	443	0	0	391	0	0	867	859	386	864	863	445
Stage 1	-	-	-	-	-	-	388	388	-	470	470	-
Stage 2	-	-	-	-	-	-	479	471	-	394	393	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1128	-	-	1173	-	-	275	296	666	277	295	617
Stage 1	-	-	-	-	-	-	640	612	-	578	563	-
Stage 2	-	-	-	-	-	-	571	563	-	635	609	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1128	-	-	1173	-	-	266	291	666	268	290	615
Mov Cap-2 Maneuver	-	-	-	-	-	-	266	291	-	268	290	-
Stage 1	-	-	-	-	-	-	639	611	-	577	554	-
Stage 2	-	-	-	-	-	-	551	554	-	623	608	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.3			14			15.8		
HCM LOS							B			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	422	1128	-	-	1173	-	-	358				
HCM Lane V/C Ratio	0.047	0.001	-	-	0.012	-	-	0.066				
HCM Control Delay (s)	14	8.2	0	-	8.1	0	-	15.8				
HCM Lane LOS	B	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.2				

PSD Pope Elementary
4: 152nd St E & 120th Ave Ct E

Existing (2017) PM Peak
HCM 6th TWSC

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	13	362	406	9	6	8
Future Vol, veh/h	13	362	406	9	6	8
Conflicting Peds, #/hr	0	0	0	0	0	0
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	54	54
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	14	393	441	10	11	15
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	451	0	-	0	867	446
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	421	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1115	-	-	-	326	617
Stage 1	-	-	-	-	649	-
Stage 2	-	-	-	-	667	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1115	-	-	-	321	617
Mov Cap-2 Maneuver	-	-	-	-	321	-
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	667	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		13.7		
HCM LOS				B		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1115	-	-	-	442	
HCM Lane V/C Ratio	0.013	-	-	-	0.059	
HCM Control Delay (s)	8.3	0	-	-	13.7	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.2	

PSD Pope Elementary
5: 118th Ave Ct E & 152nd St E

Existing (2017) PM Peak
HCM 6th TWSC

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	368	48	8	406	0	23	0	7	0	0	9
Future Vol, veh/h	3	368	48	8	406	0	23	0	7	0	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	1	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	94	94	94	92	92	92	63	63	63	56	56	56
Heavy Vehicles, %	1	1	1	1	1	1	3	3	3	11	11	11
Mvmt Flow	3	391	51	9	441	0	37	0	11	0	0	16
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	441	0	0	442	0	0	890	882	418	888	907	441
Stage 1	-	-	-	-	-	-	423	423	-	459	459	-
Stage 2	-	-	-	-	-	-	467	459	-	429	448	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.13	6.53	6.23	7.21	6.61	6.31
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.21	5.61	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.21	5.61	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.527	4.027	3.327	3.599	4.099	3.399
Pot Cap-1 Maneuver	1124	-	-	1123	-	-	262	284	633	255	266	598
Stage 1	-	-	-	-	-	-	607	586	-	565	551	-
Stage 2	-	-	-	-	-	-	574	565	-	587	558	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1124	-	-	1123	-	-	252	280	632	247	262	598
Mov Cap-2 Maneuver	-	-	-	-	-	-	252	280	-	247	262	-
Stage 1	-	-	-	-	-	-	605	584	-	563	545	-
Stage 2	-	-	-	-	-	-	552	559	-	574	556	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.2			19.7			11.2		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	293	1124	-	-	1123	-	-	598				
HCM Lane V/C Ratio	0.163	0.003	-	-	0.008	-	-	0.027				
HCM Control Delay (s)	19.7	8.2	0	-	8.2	0	-	11.2				
HCM Lane LOS	C	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.1				

Intersection

Int Delay, s/veh 0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	648	1080	2
Future Vol, veh/h	0	0	0	648	1080	2
Conflicting Peds, #/hr	1	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	40	40	81	81	93	93
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	0	0	800	1161	2

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	1963	1162	1163
Stage 1	1162	-	-
Stage 2	801	-	-
Critical Hdwy	6.4	6.2	4.1
Critical Hdwy Stg 1	5.4	-	-
Critical Hdwy Stg 2	5.4	-	-
Follow-up Hdwy	3.5	3.3	2.2
Pot Cap-1 Maneuver	70	240	608
Stage 1	300	-	-
Stage 2	445	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	70	240	608
Mov Cap-2 Maneuver	70	-	-
Stage 1	300	-	-
Stage 2	445	-	-

Approach	EB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	608	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	0	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-

PSD Pope Elementary
2: 122nd Ave E & 152nd St E

Forecast 2023 PM Peak WOP
HCM 6th Signalized Intersection Summary

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	246	248	165	619	1045	396
Future Volume (veh/h)	246	248	165	619	1045	396
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	259	261	174	652	1100	417
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	339	301	209	1339	1136	963
Arrive On Green	0.19	0.19	0.06	0.71	0.60	0.60
Sat Flow, veh/h	1795	1598	1795	1885	1885	1598
Grp Volume(v), veh/h	259	261	174	652	1100	417
Grp Sat Flow(s),veh/h/ln	1795	1598	1795	1885	1885	1598
Q Serve(g_s), s	11.5	13.3	3.2	12.9	46.7	11.8
Cycle Q Clear(g_c), s	11.5	13.3	3.2	12.9	46.7	11.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	339	301	209	1339	1136	963
V/C Ratio(X)	0.76	0.87	0.83	0.49	0.97	0.43
Avail Cap(c_a), veh/h	449	400	209	1359	1157	981
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.3	33.0	22.1	5.4	15.9	9.0
Incr Delay (d2), s/veh	3.7	11.7	22.8	0.1	18.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	6.0	3.4	3.9	22.8	3.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	36.0	44.7	44.9	5.5	34.8	9.1
LnGrp LOS	D	D	D	A	C	A
Approach Vol, veh/h	520			826	1517	
Approach Delay, s/veh	40.3			13.8	27.7	
Approach LOS	D			B	C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.0	55.1			64.1	19.8
Change Period (Y+Rc), s	4.0	4.5			4.5	4.0
Max Green Setting (Gmax), s	5.0	51.5			60.5	21.0
Max Q Clear Time (g_c+I1), s	5.2	48.7			14.9	15.3
Green Ext Time (p_c), s	0.0	1.9			3.2	0.5
Intersection Summary						
HCM 6th Ctrl Delay			26.0			
HCM 6th LOS			C			

PSD Pope Elementary
3: 121st Ave St E/Pope Dwy & 152nd St E

Forecast 2023 PM Peak WOP
HCM 6th TWSC

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	478	12	17	542	2	7	0	11	5	0	5
Future Vol, veh/h	1	478	12	17	542	2	7	0	11	5	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	3	0	0	0	0	3
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	94	94	94	92	92	92	65	65	65	38	38	38
Heavy Vehicles, %	0	1	1	1	1	0	0	0	0	0	0	0
Mvmt Flow	1	509	13	18	589	2	11	0	17	13	0	13
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	591	0	0	522	0	0	1154	1145	516	1152	1150	593
Stage 1	-	-	-	-	-	-	518	518	-	626	626	-
Stage 2	-	-	-	-	-	-	636	627	-	526	524	-
Critical Hdwy	4.1	-	-	4.11	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.209	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	995	-	-	1050	-	-	176	201	563	176	200	509
Stage 1	-	-	-	-	-	-	544	536	-	475	480	-
Stage 2	-	-	-	-	-	-	469	479	-	539	533	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	995	-	-	1050	-	-	167	196	563	167	195	508
Mov Cap-2 Maneuver	-	-	-	-	-	-	167	196	-	167	195	-
Stage 1	-	-	-	-	-	-	543	535	-	475	468	-
Stage 2	-	-	-	-	-	-	444	467	-	522	532	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0.3			18.6			21		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	293	995	-	-	1050	-	-	251				
HCM Lane V/C Ratio	0.095	0.001	-	-	0.018	-	-	0.105				
HCM Control Delay (s)	18.6	8.6	0	-	8.5	0	-	21				
HCM Lane LOS	C	A	A	-	A	A	-	C				
HCM 95th %tile Q(veh)	0.3	0	-	-	0.1	-	-	0.3				

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	483	542	12	8	11
Future Vol, veh/h	17	483	542	12	8	11
Conflicting Peds, #/hr	0	0	0	0	0	0
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	54	54
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	18	525	589	13	15	20
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	602	0	-	0	1157	596
Stage 1	-	-	-	-	596	-
Stage 2	-	-	-	-	561	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	980	-	-	-	219	507
Stage 1	-	-	-	-	554	-
Stage 2	-	-	-	-	575	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	980	-	-	-	213	507
Mov Cap-2 Maneuver	-	-	-	-	213	-
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	575	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		17.6		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	980	-	-	-	321	
HCM Lane V/C Ratio	0.019	-	-	-	0.11	
HCM Control Delay (s)	8.7	0	-	-	17.6	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4	

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	491	64	11	542	0	31	0	9	0	0	12
Future Vol, veh/h	4	491	64	11	542	0	31	0	9	0	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	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	94	94	94	92	92	92	63	63	63	56	56	56
Heavy Vehicles, %	1	1	1	1	1	1	3	3	3	11	11	11
Mvmt Flow	4	522	68	12	589	0	49	0	14	0	0	21
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	589	0	0	590	0	0	1188	1177	557	1185	1211	589
Stage 1	-	-	-	-	-	-	564	564	-	613	613	-
Stage 2	-	-	-	-	-	-	624	613	-	572	598	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.13	6.53	6.23	7.21	6.61	6.31
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.21	5.61	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.21	5.61	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.527	4.027	3.327	3.599	4.099	3.399
Pot Cap-1 Maneuver	991	-	-	990	-	-	164	190	528	159	175	492
Stage 1	-	-	-	-	-	-	509	507	-	465	469	-
Stage 2	-	-	-	-	-	-	471	482	-	490	477	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	991	-	-	990	-	-	154	185	527	152	171	492
Mov Cap-2 Maneuver	-	-	-	-	-	-	154	185	-	152	171	-
Stage 1	-	-	-	-	-	-	506	504	-	462	461	-
Stage 2	-	-	-	-	-	-	442	473	-	473	474	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.2			34.8			12.7		
HCM LOS							D			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	183	991	-	-	990	-	-	492				
HCM Lane V/C Ratio	0.347	0.004	-	-	0.012	-	-	0.044				
HCM Control Delay (s)	34.8	8.6	0	-	8.7	0	-	12.7				
HCM Lane LOS	D	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	1.5	0	-	-	0	-	-	0.1				

PSD Pope Elementary
1: 122nd Ave E & Pope Dwy

Forecast 2023 PM Peak WOP
HCM 6th TWSC

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	865	1441	2
Future Vol, veh/h	0	0	0	865	1441	2
Conflicting Peds, #/hr	1	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	40	40	81	81	93	93
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	0	0	1068	1549	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2619	1550	1551	0	-	0
Stage 1	1550	-	-	-	-	-
Stage 2	1069	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	27	142	433	-	-	-
Stage 1	195	-	-	-	-	-
Stage 2	333	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	27	142	433	-	-	-
Mov Cap-2 Maneuver	27	-	-	-	-	-
Stage 1	195	-	-	-	-	-
Stage 2	333	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	433	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

PSD Pope Elementary
2: 122nd Ave E & 152nd St E

Forecast 2023 PM WProj
HCM 6th Signalized Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	247	249	166	619	1045	396
Future Volume (veh/h)	247	249	166	619	1045	396
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	260	262	175	652	1100	412
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.96
Percent Heavy Veh, %	1	1	1	1	1	1
Cap, veh/h	340	302	208	1338	1136	963
Arrive On Green	0.19	0.19	0.06	0.71	0.60	0.60
Sat Flow, veh/h	1795	1598	1795	1885	1885	1598
Grp Volume(v), veh/h	260	262	175	652	1100	412
Grp Sat Flow(s),veh/h/ln	1795	1598	1795	1885	1885	1598
Q Serve(g_s), s	11.5	13.4	3.3	12.9	46.8	11.6
Cycle Q Clear(g_c), s	11.5	13.4	3.3	12.9	46.8	11.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	340	302	208	1338	1136	963
V/C Ratio(X)	0.77	0.87	0.84	0.49	0.97	0.43
Avail Cap(c_a), veh/h	449	399	208	1358	1156	979
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.3	33.0	22.2	5.4	15.9	8.9
Incr Delay (d2), s/veh	3.8	11.9	23.9	0.1	19.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	6.0	3.4	3.9	22.9	3.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	36.1	44.9	46.2	5.5	34.9	9.1
LnGrp LOS	D	D	D	A	C	A
Approach Vol, veh/h	522			827	1512	
Approach Delay, s/veh	40.5			14.1	27.9	
Approach LOS	D			B	C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	9.0	55.1			64.1	19.9
Change Period (Y+Rc), s	4.0	4.5			4.5	4.0
Max Green Setting (Gmax), s	5.0	51.5			60.5	21.0
Max Q Clear Time (g_c+I1), s	5.3	48.8			14.9	15.4
Green Ext Time (p_c), s	0.0	1.8			3.2	0.5
Intersection Summary						
HCM 6th Ctrl Delay			26.2			
HCM 6th LOS			C			

Intersection						
Int Delay, s/veh	0.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	485	12	17	545	7	11
Future Vol, veh/h	485	12	17	545	7	11
Conflicting Peds, #/hr	0	0	0	0	3	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	20	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	92	92	65	65
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	516	13	18	592	11	17
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	529	0	1154	523
Stage 1	-	-	-	-	523	-
Stage 2	-	-	-	-	631	-
Critical Hdwy	-	-	4.11	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.209	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1043	-	220	558
Stage 1	-	-	-	-	599	-
Stage 2	-	-	-	-	534	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	1043	-	216	558
Mov Cap-2 Maneuver	-	-	-	-	348	-
Stage 1	-	-	-	-	589	-
Stage 2	-	-	-	-	532	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.3		13.5	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	452	-	-	1043	-	
HCM Lane V/C Ratio	0.061	-	-	0.018	-	
HCM Control Delay (s)	13.5	-	-	8.5	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-	

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	17	483	542	12	8	12
Future Vol, veh/h	17	483	542	12	8	12
Conflicting Peds, #/hr	0	0	0	0	0	0
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	54	54
Heavy Vehicles, %	1	1	1	1	0	0
Mvmt Flow	18	525	589	13	15	22
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	602	0	-	0	1157	596
Stage 1	-	-	-	-	596	-
Stage 2	-	-	-	-	561	-
Critical Hdwy	4.11	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.209	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	980	-	-	-	219	507
Stage 1	-	-	-	-	554	-
Stage 2	-	-	-	-	575	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	980	-	-	-	213	507
Mov Cap-2 Maneuver	-	-	-	-	213	-
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	575	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		17.4		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	980	-	-	-	327	
HCM Lane V/C Ratio	0.019	-	-	-	0.113	
HCM Control Delay (s)	8.7	0	-	-	17.4	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4	

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	4	491	64	11	543	0	31	0	9	0	0	12
Future Vol, veh/h	4	491	64	11	543	0	31	0	9	0	0	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	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	94	94	94	92	92	92	63	63	63	56	56	56
Heavy Vehicles, %	1	1	1	1	1	1	3	3	3	11	11	11
Mvmt Flow	4	522	68	12	590	0	49	0	14	0	0	21
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	590	0	0	590	0	0	1189	1178	557	1186	1212	590
Stage 1	-	-	-	-	-	-	564	564	-	614	614	-
Stage 2	-	-	-	-	-	-	625	614	-	572	598	-
Critical Hdwy	4.11	-	-	4.11	-	-	7.13	6.53	6.23	7.21	6.61	6.31
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.21	5.61	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.21	5.61	-
Follow-up Hdwy	2.209	-	-	2.209	-	-	3.527	4.027	3.327	3.599	4.099	3.399
Pot Cap-1 Maneuver	990	-	-	990	-	-	164	190	528	159	175	491
Stage 1	-	-	-	-	-	-	509	507	-	464	469	-
Stage 2	-	-	-	-	-	-	471	481	-	490	477	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	990	-	-	990	-	-	154	185	527	152	171	491
Mov Cap-2 Maneuver	-	-	-	-	-	-	154	185	-	152	171	-
Stage 1	-	-	-	-	-	-	506	504	-	461	461	-
Stage 2	-	-	-	-	-	-	442	472	-	473	474	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.1			0.2			34.8			12.7		
HCM LOS							D			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	183	990	-	-	990	-	-	491				
HCM Lane V/C Ratio	0.347	0.004	-	-	0.012	-	-	0.044				
HCM Control Delay (s)	34.8	8.7	0	-	8.7	0	-	12.7				
HCM Lane LOS	D	A	A	-	A	A	-	B				
HCM 95th %tile Q(veh)	1.5	0	-	-	0	-	-	0.1				

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	866	1441	3
Future Vol, veh/h	0	0	0	866	1441	3
Conflicting Peds, #/hr	1	0	1	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	40	40	81	81	93	93
Heavy Vehicles, %	0	0	0	1	1	0
Mvmt Flow	0	0	0	1069	1549	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	2622	1552	1553	0	-	0
Stage 1	1552	-	-	-	-	-
Stage 2	1070	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	27	141	432	-	-	-
Stage 1	194	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	27	141	432	-	-	-
Mov Cap-2 Maneuver	27	-	-	-	-	-
Stage 1	194	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	432	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	0	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0	-	-	-	-	

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	490	549	3	7	5
Future Vol, veh/h	1	490	549	3	7	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	97	97	47	47
Heavy Vehicles, %	0	5	5	0	0	0
Mvmt Flow	1	544	566	3	15	11
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	569	0	-	0	1114	568
Stage 1	-	-	-	-	568	-
Stage 2	-	-	-	-	546	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1013	-	-	-	232	526
Stage 1	-	-	-	-	571	-
Stage 2	-	-	-	-	584	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1013	-	-	-	232	526
Mov Cap-2 Maneuver	-	-	-	-	369	-
Stage 1	-	-	-	-	570	-
Stage 2	-	-	-	-	584	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		13.9		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1013	-	-	-	369	526
HCM Lane V/C Ratio	0.001	-	-	-	0.04	0.02
HCM Control Delay (s)	8.6	-	-	-	15.2	12
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.1

APPENDIX D

Turn Lane Storage Charts



152nd St E / RELOCATED SITE ACCESS

MORNING PEAK

79 ↑ ↖ 117
239 → ← 412

$V_a = 318$

$V_o = 529$

$L\% = 25\%$

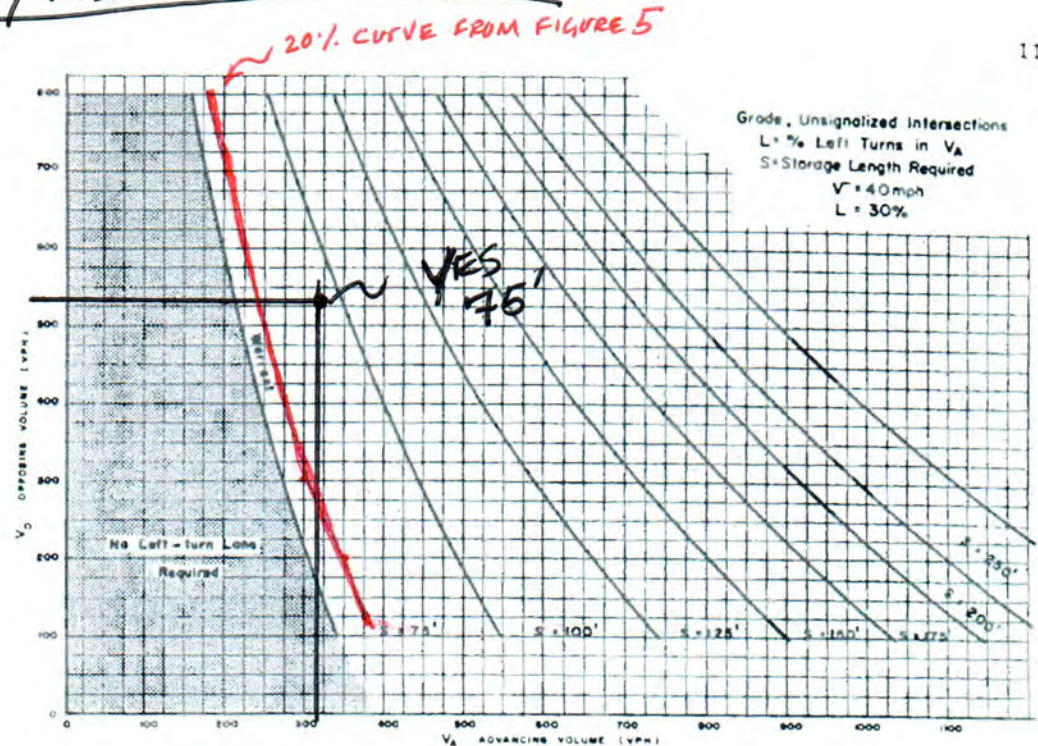


Figure 6. Warrant for left-turn storage lanes on two-lane highways.

152nd St. E / RELOCATED Main ACCESS

AFTERNOON PK

47 ↑ ↖ 42
449 → ← 516

$V_a = 496$

$V_o = 558$

$L\% = \sim 10\%$

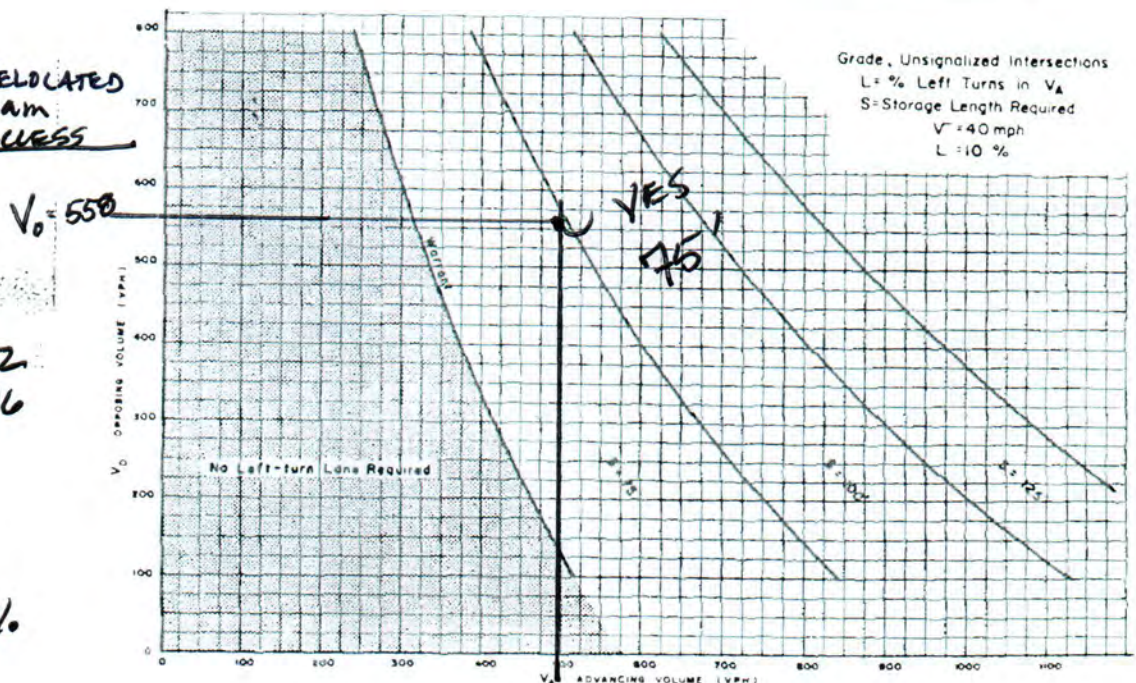


Figure 3. Warrant for left-turn storage lanes on two-lane highways.

$V_a = 496$

120th Ave Ct E / 152nd St E

Morning

$V_a = 323$
 $q \uparrow \leftarrow 11$
 $314 \rightarrow \leftarrow 511$
 $V_o = 522$
 $L\% = 2.0\%$

Afternoon

$V_a = 496$
 $11 \uparrow \leftarrow 12$
 $485 \rightarrow \leftarrow 559$
 $V_o = 571$
 $L\% = 2.2\%$

PM PK

$V_a = 500$
 $17 \uparrow \leftarrow 12$
 $483 \rightarrow \leftarrow 542$
 $V_o = 554$
 $L\% = 3.5\%$

152nd St. E / RELOCATED ACCESS

PM PEAK
 $V_a = 491$
 $1 \uparrow \leftarrow 3$
 $490 \rightarrow \leftarrow 549$
 $V_o = 552$
 $L\% = 0.2\%$

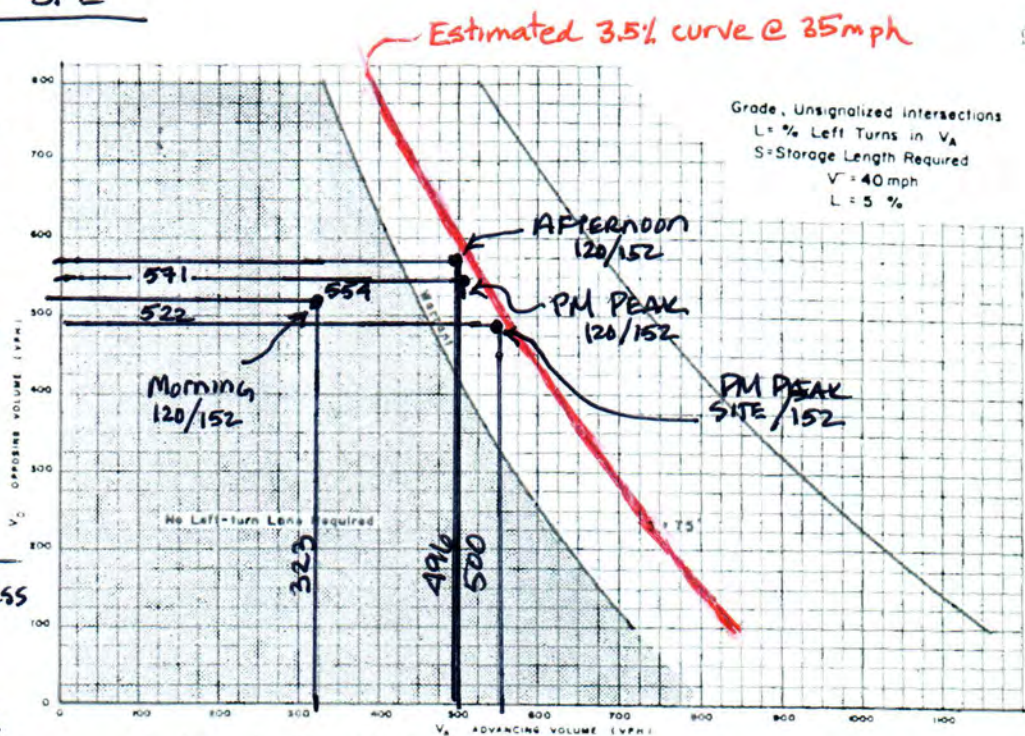


Figure 2. Warrant for left-turn storage lanes on two-lane highways.

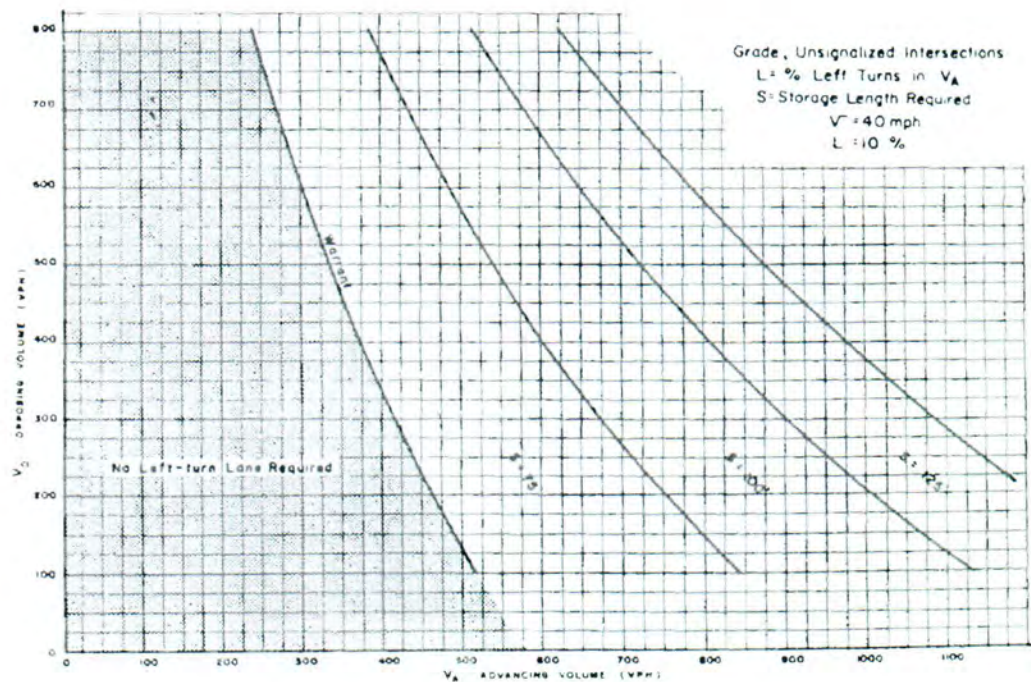


Figure 3. Warrant for left-turn storage lanes on two-lane highways.

APPENDIX E

Simulation Model Results



Intersection: 1: 122nd Ave E & Pope Dwy

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	41	77	75
Average Queue (ft)	11	6	4
95th Queue (ft)	36	41	27
Link Distance (ft)	172	389	308
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: 122nd Ave E & 152nd St E

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	105	146	296	385	214	128
Average Queue (ft)	70	43	100	154	104	53
95th Queue (ft)	104	100	203	307	178	94
Link Distance (ft)		130		466	389	
Upstream Blk Time (%)		1		0		
Queuing Penalty (veh)		2		0		
Storage Bay Dist (ft)	85		300			200
Storage Blk Time (%)	5	1	0	1	0	
Queuing Penalty (veh)	7	1	0	3	0	

Intersection: 3: 121st Ave St E & 152nd St E

Movement	EB	WB	NB
Directions Served	TR	T	LR
Maximum Queue (ft)	71	131	65
Average Queue (ft)	9	24	20
95th Queue (ft)	40	86	49
Link Distance (ft)	84	130	222
Upstream Blk Time (%)	0	0	
Queuing Penalty (veh)	0	1	
Storage Bay Dist (ft)			
Storage Blk Time (%)		2	
Queuing Penalty (veh)		0	

Intersection: 4: 152nd St E & 120th Ave Ct E

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	53	41	79
Average Queue (ft)	5	2	22
95th Queue (ft)	29	18	63
Link Distance (ft)	14	131	566
Upstream Blk Time (%)	1		
Queuing Penalty (veh)	2		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: 118th Ave Ct E & 152nd St E

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	31	45	66	42
Average Queue (ft)	1	5	29	6
95th Queue (ft)	16	25	55	28
Link Distance (ft)	549	492	425	436
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 6: 152nd St E & Pope Access

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	75	21	82	241	192
Average Queue (ft)	28	1	8	70	51
95th Queue (ft)	61	11	40	200	142
Link Distance (ft)		131	84	246	246
Upstream Blk Time (%)			0	5	3
Queuing Penalty (veh)			1	0	0
Storage Bay Dist (ft)	100				
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 1: 122nd Ave E & Pope Dwy

Movement	EB	NB	SB
Directions Served	LR	LT	TR
Maximum Queue (ft)	173	103	362
Average Queue (ft)	60	17	293
95th Queue (ft)	163	62	449
Link Distance (ft)	172	389	308
Upstream Blk Time (%)	11		45
Queuing Penalty (veh)	0		0
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: 122nd Ave E & 152nd St E

Movement	EB	EB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	R
Maximum Queue (ft)	110	176	232	275	405	225
Average Queue (ft)	96	106	103	141	379	210
95th Queue (ft)	125	181	184	232	461	281
Link Distance (ft)		130		466	389	
Upstream Blk Time (%)		8			11	
Queuing Penalty (veh)		39			132	
Storage Bay Dist (ft)	85		300			200
Storage Blk Time (%)	22	6		0	36	0
Queuing Penalty (veh)	47	18		0	128	4

Intersection: 3: 121st Ave St E & 152nd St E

Movement	EB	WB	WB	NB
Directions Served	TR	L	T	LR
Maximum Queue (ft)	102	43	146	65
Average Queue (ft)	44	11	62	17
95th Queue (ft)	104	36	139	50
Link Distance (ft)	84		130	222
Upstream Blk Time (%)	3		1	
Queuing Penalty (veh)	15		6	
Storage Bay Dist (ft)		20		
Storage Blk Time (%)		2	8	
Queuing Penalty (veh)		12	1	

Intersection: 4: 152nd St E & 120th Ave Ct E

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	62	78	109
Average Queue (ft)	12	7	22
95th Queue (ft)	44	42	71
Link Distance (ft)	35	130	567
Upstream Blk Time (%)	1	0	
Queuing Penalty (veh)	7	0	
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 5: 118th Ave Ct E & 152nd St E

Movement	WB	NB
Directions Served	LTR	LTR
Maximum Queue (ft)	90	101
Average Queue (ft)	9	34
95th Queue (ft)	43	72
Link Distance (ft)	472	425
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 6: 152nd St E & School Access

Movement	EB	EB	WB	SB	SB
Directions Served	L	T	TR	L	R
Maximum Queue (ft)	45	108	37	148	60
Average Queue (ft)	15	13	2	46	21
95th Queue (ft)	42	63	17	115	50
Link Distance (ft)		130	84	244	244
Upstream Blk Time (%)		0	0		
Queuing Penalty (veh)		2	0		
Storage Bay Dist (ft)	100				
Storage Blk Time (%)		1			
Queuing Penalty (veh)		0			