



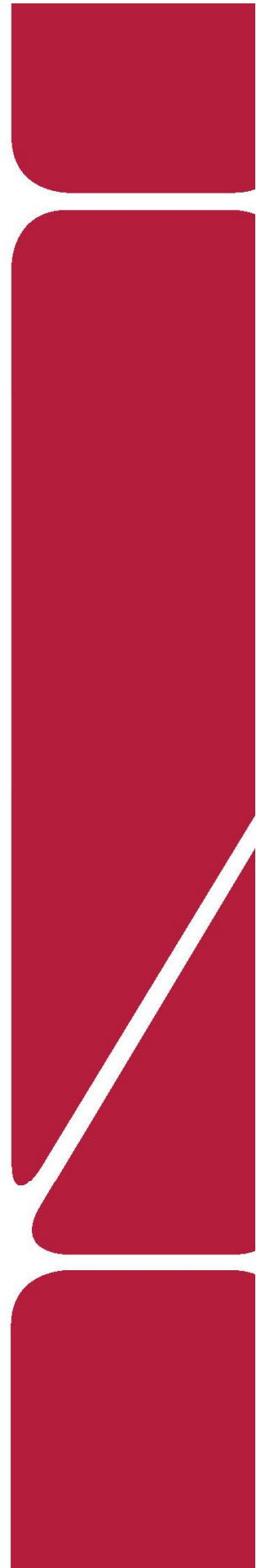
Traffic Impact Study

Porteos Distribution Facility
(Lot 10B)
Aurora, Colorado

Prepared for:

SunCap Property Group, LLC

Kimley»Horn



T R A F F I C I M P A C T S T U D Y

Porteos Distribution Facility (Lot 10B)

Aurora, Colorado

Prepared for
SunCap Property Group, LLC
1125 17th Street
Suite 800
Denver, CO 80202

Prepared by
Kimley-Horn and Associates, Inc.
4582 South Ulster Street
Suite 1500
Denver, Colorado 80237
(303) 228-2300



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1.0 EXECUTIVE SUMMARY

Porteos Distribution Facility (Lot 10B) is proposed to be located on the northwest corner of the 56th Avenue and Jackson Gap Street intersection in Aurora, Colorado. It is expected that the project will be completed within the next couple of years; therefore, analysis was conducted for the 2023 short term horizon as well as the 2040 long-term horizon per City of Aurora requirements.

The purpose of this traffic study is to identify project traffic generation characteristics and potential project traffic related impacts on the local street system, as well as to develop mitigation measures required for identified impacts. The following intersection was incorporated into this traffic study in accordance with City of Aurora standards and requirements:

- Jackson Gap Street and 56th Avenue

In addition, the two proposed accesses along 56th Avenue and three proposed accesses along Jackson Gap Street were included for evaluation.

Regional access will be provided by Interstate 70 (I-70), Interstate 225 (I-225), E-470, and Pena Boulevard. Primary access to the site will be provided by 56th Avenue and Jackson Gap Street. Direct access to the project is proposed from one full movement access and one right-in/right-out access along 56th Avenue and three full movement accesses along Jackson Gap Street. The proposed west full movement access along 56th Avenue is designated for trucks and is the primary truck access for the development. The proposed north full movement access along Jackson Gap Street is also designated for trucks and is the secondary access for trucks. The two truck accesses will have gated stations for trucks entering and exiting the site. The right-in/right-out access along 56th Avenue and the south full movement access along Jackson Gap Street are designated for employee parking. The middle full movement access along Jackson Gap Street is designated for delivery van operations. The van access will have a gated station for vans entering and exiting the site.

Based on the anticipated facility operations, the overall Porteos Distribution Facility is expected to generate approximately 2,656 daily weekday trips. Of these, 177 trips are expected to occur

during the weekday morning peak hour while 235 trips are expected during the weekday afternoon peak hour.

Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns, anticipated surrounding development in the area, and the proposed access system for the project. Assignment of project traffic was based upon the trip generation described previously and the distributions developed.

Based on the analysis presented in this report, Kimley-Horn believes the proposed Porteos Distribution Facility (Lot 10B) will be successfully incorporated into the existing and future roadway network. The proposed project development and expected traffic volumes resulted in the following recommendations and conclusions:

- With completion of the Porteos Distribution Facility (Lot 10B), the site proposes two accesses along the north side of 56th Avenue and three accesses along the west side of Jackson Gap Street. The west access along 56th Avenue will be designated for trucks and proposes full movements while the east access along 56th Avenue will serve employees and be restricted to right-in/right-out movements. The three accesses along Jackson Gap Street propose to allow full turning movements with the south access designated for employee parking, the middle access serving the transport vans, and the north access being a secondary truck access. The project accesses are recommended to have a R1-1 "STOP" sign installed for the exiting approaches. Single lanes should be sufficient on the exiting approaches at all five accesses; however, providing separate left and right turn lanes for exiting could be considered at the full movement accesses.
- The right-in/right-out access along 56th Avenue, it is recommended a R3-2 No Left Turn sign be placed underneath the STOP sign on the southbound driveway approach of the right-in/right-out access along 56th Avenue. In addition, a "Pork Chop" island is recommended to be installed at this access per City of Aurora requirements. Due to the absence of a raised median within 56th Avenue, a R3-2 No Left Turn sign should be placed on the northeast corner of the right-in/right-out access intersection, visible to eastbound drivers along 56th Avenue to restrict entering left turn movements.

- The truck access along 56th Avenue will require a designated eastbound left turn lane with a length of 275 feet. The south access along Jackson Gap Street will require a northbound left turn lane with a length of 150 feet.
- An eastbound left turn lane with a length of 275 feet should be provided at the intersection of 56th Avenue and Jackson Gap Street while a southbound left turn lane with a length of 150 feet should be provided at this intersection.
- Any on-site and off-site signing and striping improvements should be incorporated into the Civil Drawings and conform to City of Aurora Standards as well as the Manual on Uniform Traffic Control Devices – 2009 Edition (MUTCD).

2.0 INTRODUCTION

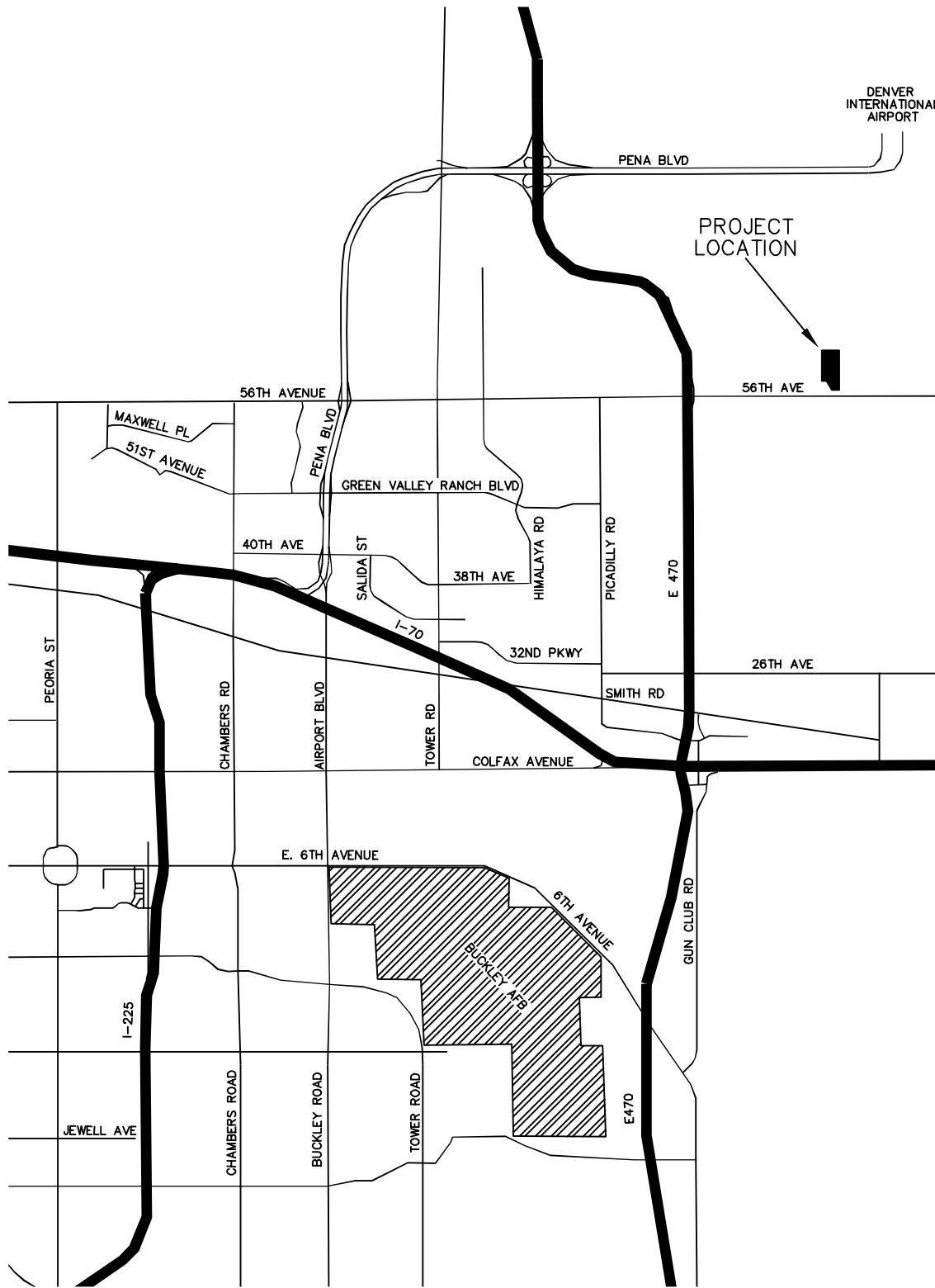
Kimley-Horn and Associates, Inc. has prepared this report to document the results of a Traffic Impact Study of future traffic conditions associated with the proposed Porteos Distribution Facility (Lot 10B) to be located on the northwest corner of the 56th Avenue and Jackson Gap Street intersection in Aurora, Colorado. A vicinity map is shown in **Figure 1**. A conceptual site plan illustrating the development is shown in **Appendix F**. It is expected that the project will be completed within the next couple of years; therefore, analysis was conducted for the 2023 short term horizon as well as the 2040 long-term horizon per Aurora requirements.

The purpose of this traffic study is to identify project traffic generation characteristics and potential project traffic related impacts on the local street system, as well as to develop mitigation measures required for identified impacts. The following intersection was incorporated into this traffic study in accordance with City of Aurora standards and requirements:

- Jackson Gap Street and 56th Avenue

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Regional access will be provided by Interstate 70 (I-70), Interstate 225 (I-225), E-470, and Pena Boulevard. Primary access to the site will be provided by 56th Avenue and Jackson Gap Street. Direct access to the project is proposed from one full movement access and one right-in/right-out access along 56th Avenue and three full movement accesses along Jackson Gap Street. The proposed west full movement access along 56th Avenue is designated for trucks and is the primary truck access for the development. The proposed north full movement access along Jackson Gap Street is also designated for trucks and is the secondary access for trucks. The two truck accesses will have gated stations for trucks entering and exiting the site. The right-in/right-out access along 56th Avenue and the south full movement access along Jackson Gap Street are designated for employee parking. The middle full movement access along Jackson Gap Street is designated for delivery van operations. The van access will have a gated station for vans entering and exiting the site.



PORTEOS DISTRIBUTION FACILITY
AURORA, CO
VICINITY MAP

FIGURE 1

3.0 EXISTING AND FUTURE CONDITIONS

3.1 Existing Study Area

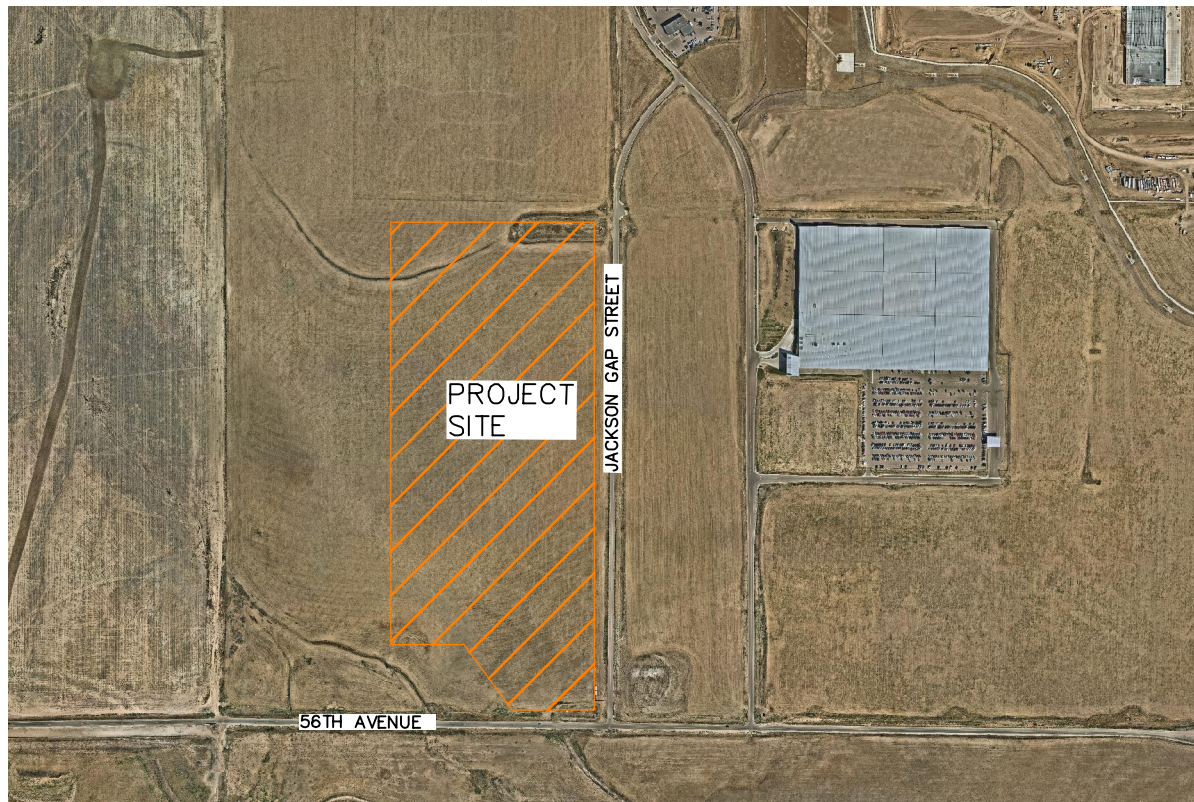
The existing site is comprised of vacant land. East of the project site is a Fine Airport Parking Lot and a Silvercar by Audi car rental agency. North of the project site is an Ace Car Rental agency. A Costco Depot project is currently being constructed to the northeast of the project. Further north of the project site is the Denver International Airport. The extended area surrounding the project site is mainly comprised of vacant land. The land uses and roadway network surrounding the site are shown in the aerial of **Figure 2**.

3.2 Existing and Future Roadway Network

Jackson Gap Street provides a single lane of travel in both directions, northbound and southbound, with a 40 mile per hour posted speed limit, and solid yellow centerline striping. It is anticipated that this portion of Jackson Gap Street through the study area will be improved to a three-lane roadway sometime in the future. 56th Avenue provides one lane of travel in each direction, eastbound and westbound, adjacent to the project site with a posted speed limit of 45 miles per hour.

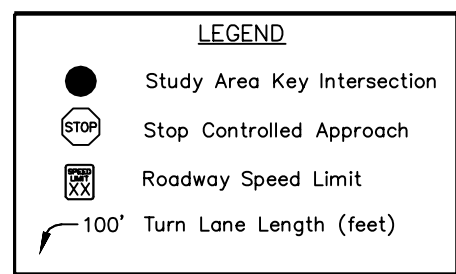
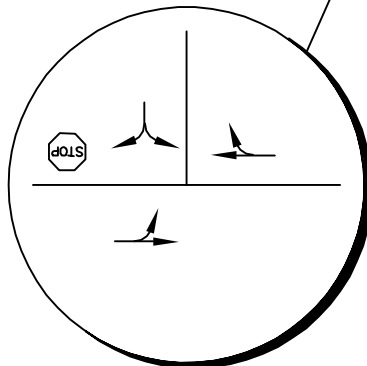
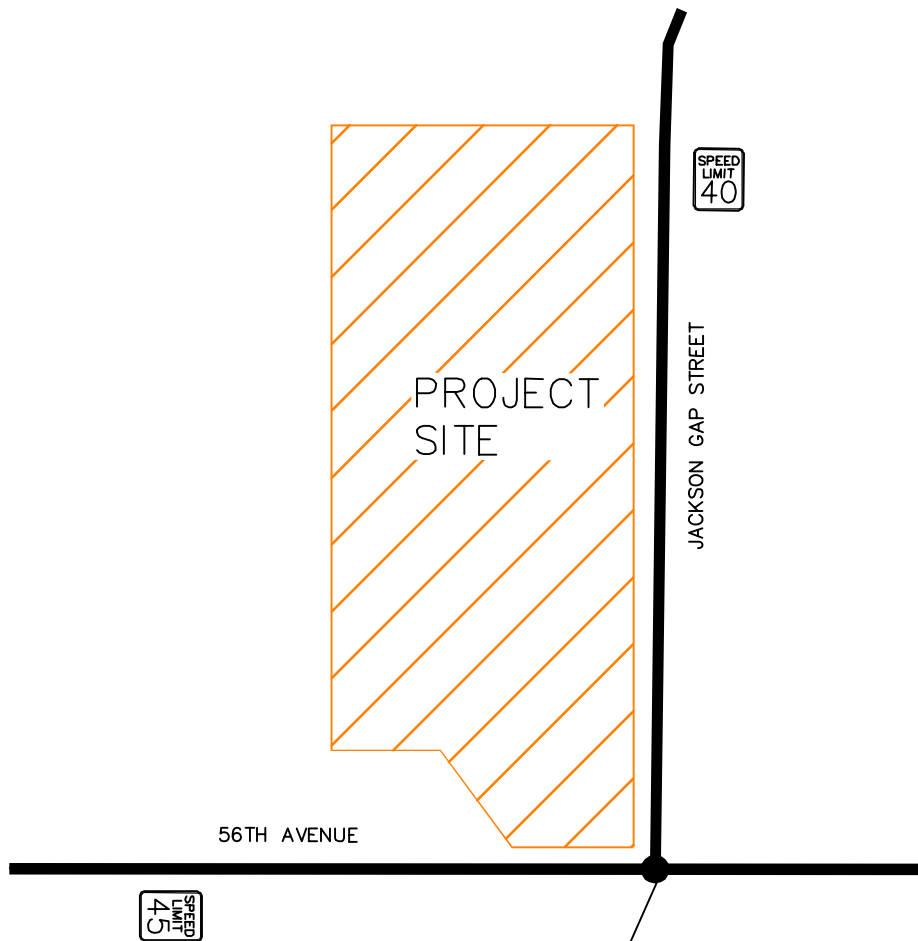
Jackson Gap Street and 56th Avenue is an unsignalized “T”-intersection with stop control along the southbound Jackson Gap Street approach. The eastbound and westbound approaches provide a single approach lane for shared movements. The southbound approach provides a shared left/right turn lane.

The intersection lane configuration and control for the study area key intersections are shown in **Figure 3**.



PORTEOS DISTRIBUTION FACILITY
AURORA, CO
SURROUNDING SITE AREA

FIGURE 2



PORTEOS DISTRIBUTION FACILITY
AURORA, CO
EXISTING LANE CONFIGURATIONS

FIGURE 3

3.3 Existing Traffic Volumes

Existing peak hour turning movement counts were conducted at the intersection of Jackson Gap Street and 56th Avenue on Thursday, October 8, 2020. Counts were conducted in 15-minute intervals during the morning and afternoon peak hours of adjacent street traffic from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on this count date.

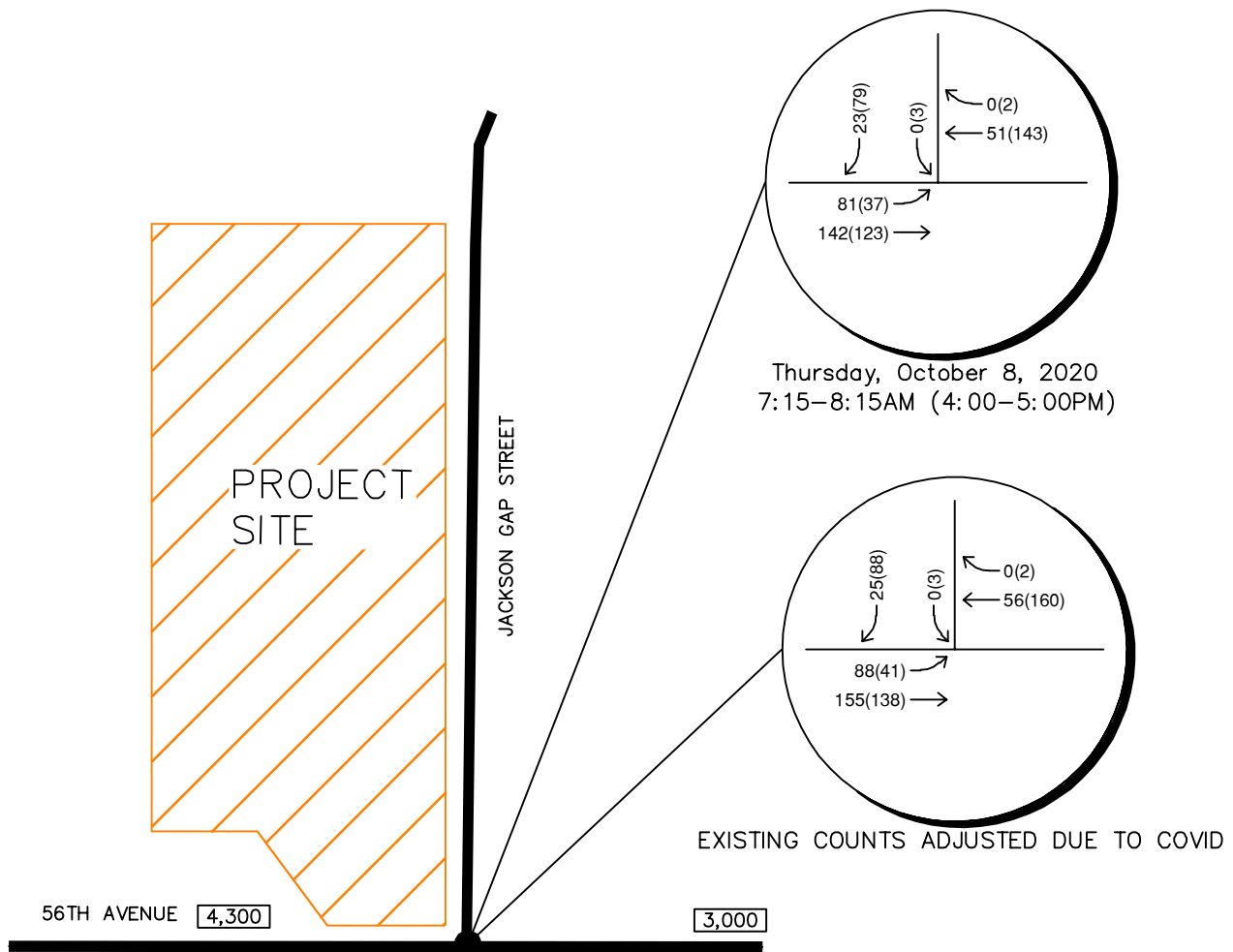
Due to the Jackson Gap Street and 56th Avenue counts being collected during the COVID-19 Pandemic, an adjustment factor was determined in order to grow the counts to pre-COVID conditions. Based on the count comparison with the Jackson Gap Street and Jackson Gap Way volumes, it was determined that a 1.09 adjustment factor be applied to the morning peak hour volumes and 1.12 adjustment factor be applied to afternoon peak hour existing volumes. In addition, a two (2) percent City of Aurora standard annual growth rate was applied to Jackson Gap Street and Jackson Gap way to generate existing 2020 volumes. The existing and adjusted existing peak hour turning movement counts are shown in **Figure 4** with count sheets provided in **Appendix A**.

3.4 Unspecified Development Traffic Growth

To generate background traffic volumes in year 2023, the City of Aurora standard annual growth rate of two (2) percent was applied to the existing turning movement counts. In addition, site generated traffic volumes from the “Porteos – Project Pearl in Aurora”, September 2020, “Aurora Costco Depot Transportation Impact Study”, August 2019, and “Ryder Truck Facility Traffic Impact Study”, April 2020 were included as background traffic in 2023. The short-term and long-term total traffic volumes from the Porteos – Project Pearl study were used as a basis for 2023 and 2040 background traffic volumes along Jackson Gap Street in this study. Short-term background traffic volumes from the Porteos – Project Pearl study were based on volumes from the Jackson Gap ISP Traffic Study (2020) which used NEATS Refresh modeling and Porteos Master TIS Update (2017). The long-term background traffic volumes from the Porteos – Project Pearl study were estimated using traffic volume projections from the Jackson Gap ISP Traffic Study with the removal of estimated trips within PAs 8a and 8b associated with the Project Pearl site from the Porteos Master Plan Traffic Study.

2040 total traffic volumes from the Aurora Costco Depot study were used as a basis to determine 2040 background traffic volumes along 56th Avenue at the intersection with Jackson

Gap Street. Long-term background traffic volumes from the Aurora Costco Depot were based on volumes from the Porteos Master Transportation Plan, NEATS Refresh, Groot Distribution Center TIS, and JAG Logistics Center at DIA TIS. Applicable documents from the Porteos – Project Pearl, Aurora Costco Depot, and Ryder Truck traffic studies are included in **Appendix B**. The calculated background traffic volumes for 2023 and 2040 are shown in **Figure 5** and **Figure 6**, respectively.

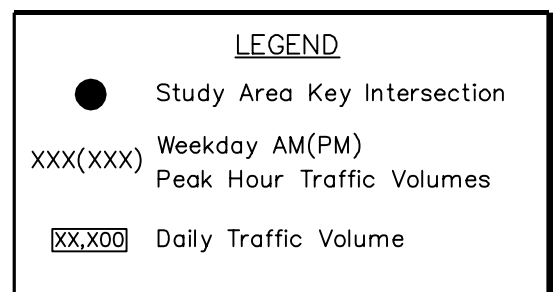
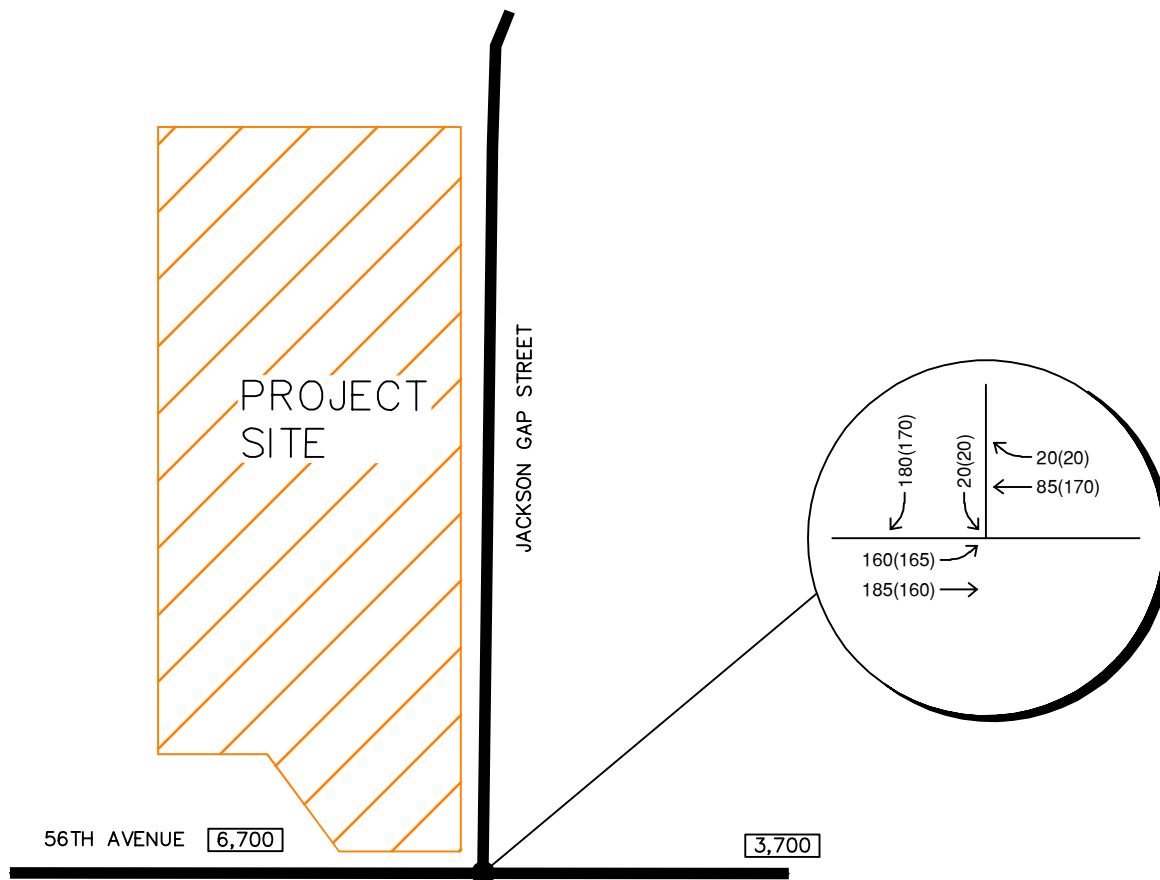


LEGEND

- Study Area Key Intersection
- xxx(xxx) Weekday AM(PM)
Peak Hour Traffic Volumes
- xx,x00 Daily Traffic Volume

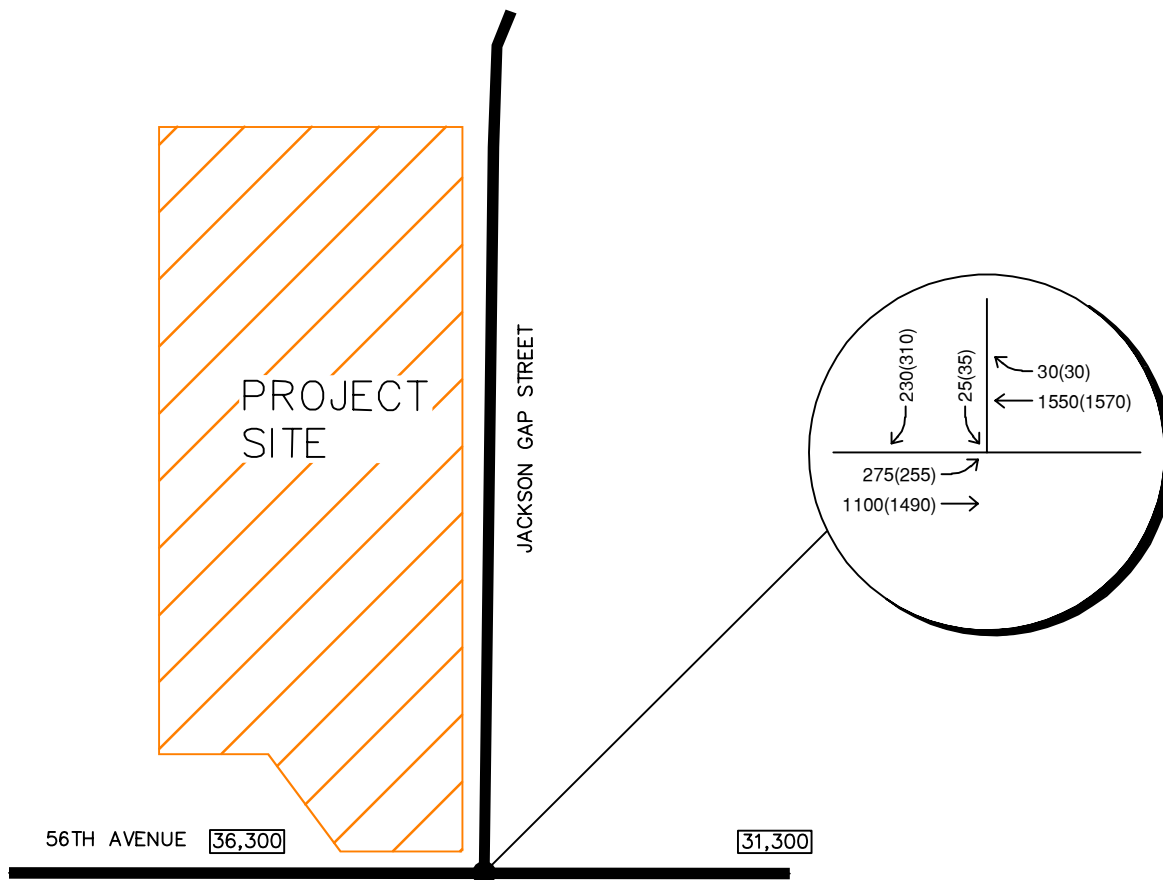
PORTEOS DISTRIBUTION FACILITY
AURORA, CO
EXISTING ADJUSTED TRAFFIC VOLUMES

FIGURE 4



PORTEOS DISTRIBUTION FACILITY
AURORA, CO
2023 BACKGROUND TRAFFIC VOLUMES

FIGURE 5



LEGEND

- Study Area Key Intersection
- xxx(xxx) Weekday AM(PM)
Peak Hour Traffic Volumes
- xx,x00 Daily Traffic Volume

PORTEOS DISTRIBUTION FACILITY
AURORA, CO
2040 BACKGROUND TRAFFIC VOLUMES

FIGURE 6

4.0 PROJECT TRAFFIC CHARACTERISTICS

4.1 Trip Generation

Site-generated traffic estimates are determined through a process known as trip generation. The proposed distribution processing facility is anticipated to be completed within a couple years with the facility opening sometime in 2023. Given the specific nature of this site, a methodology separate from the typical ITE Trip Generation Manual and Handbook was developed based on user specific data to determine the trip generation potential of such sites. The trip projections for package distribution facility are based on the anticipated employee automobile numbers, packing and delivery vans, spot trailers, and linehaul truck numbers associated with the project have been calculated based on project build-out year. The proposed Porteos Distribution Facility (Lot 10B) facility is anticipated to include an approximate 479,000 square feet of distribution facility. Trip generation rates and equations were determined by other sites with the same land use.

Based on the anticipated facility operations and user specific data provided, the overall Porteos Distribution Facility is expected to generate approximately 2,656 daily weekday trips. Of these, 177 trips are expected to occur during the weekday morning peak hour while 235 trips are expected during the weekday afternoon peak hour. Site specific trips have been allocated into passenger vehicle trips, truck trips, and delivery vehicle trips. **Table 1** summarizes the estimated trip generation for the proposed development. The trip generation worksheet is included in **Appendix C**.

Table 1 – Porteos Distribution Facility Traffic Generation

Land Use	Daily	Vehicle Trips					
		Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Passenger Vehicles	1,074	30	68	98	68	95	163
Trucks	1,430	27	30	57	22	35	57
Delivery Vehicles (Vans)	152	0	22	22	15	0	15
Total Trips Generated	2,656	57	120	177	105	130	235

4.2 Trip Distribution

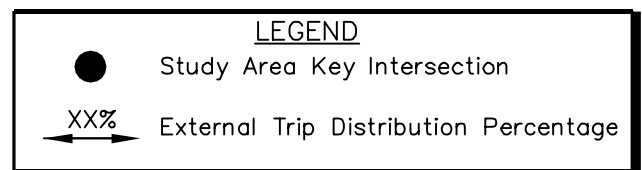
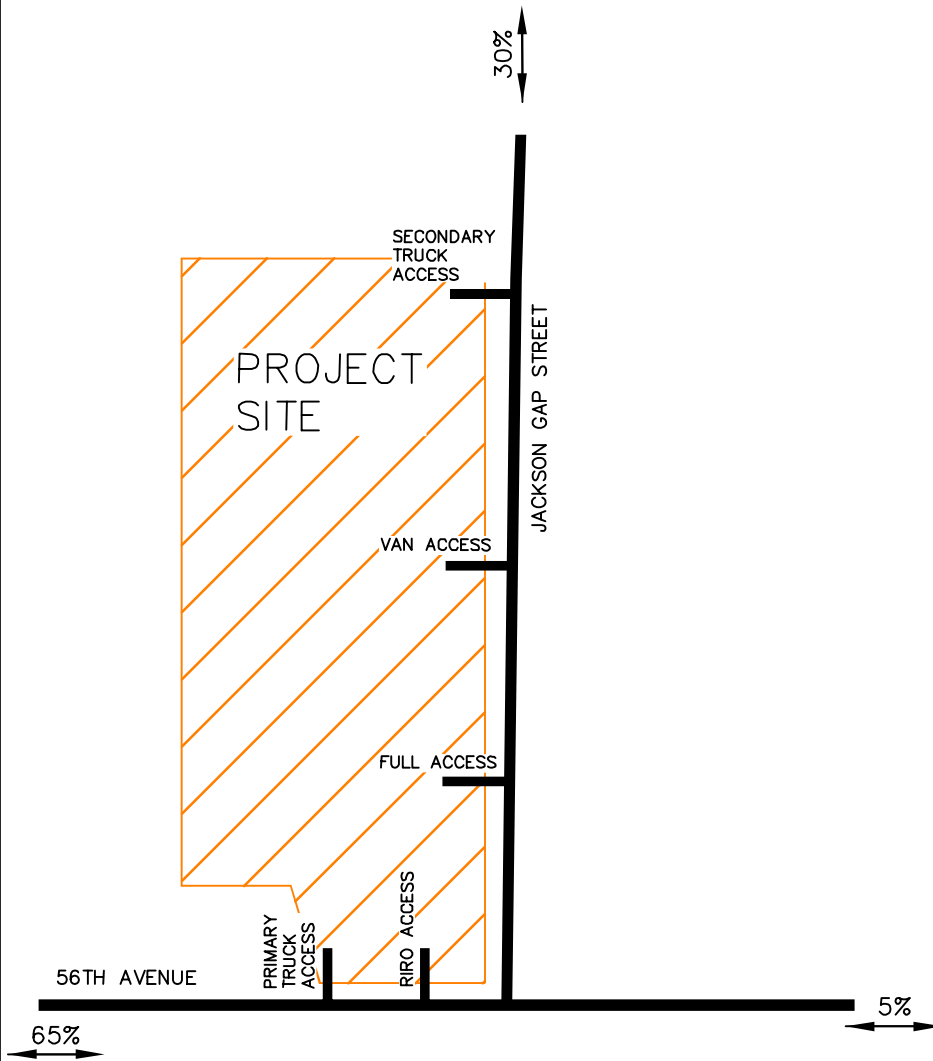
Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns, existing and anticipated surrounding demographic information, expected roadway improvements, and the proposed access system for the project. The directional distribution of traffic is a means to quantify the percentage of site-generated traffic that approaches the site from a given direction and departs the site back to the original source. Project trip distribution accounts for trucks having two designated accesses, delivery vehicles having one access, and the associate passenger vehicle lot having two access locations. The project trip distribution is illustrated in **Figure 7**.

4.3 Traffic Assignment

Traffic assignment was obtained by applying the project trip distribution to the estimated traffic generation of the development shown in **Table 1**. Site traffic assignment for the proposed Porteos Distribution Facility is shown in **Figure 8**.

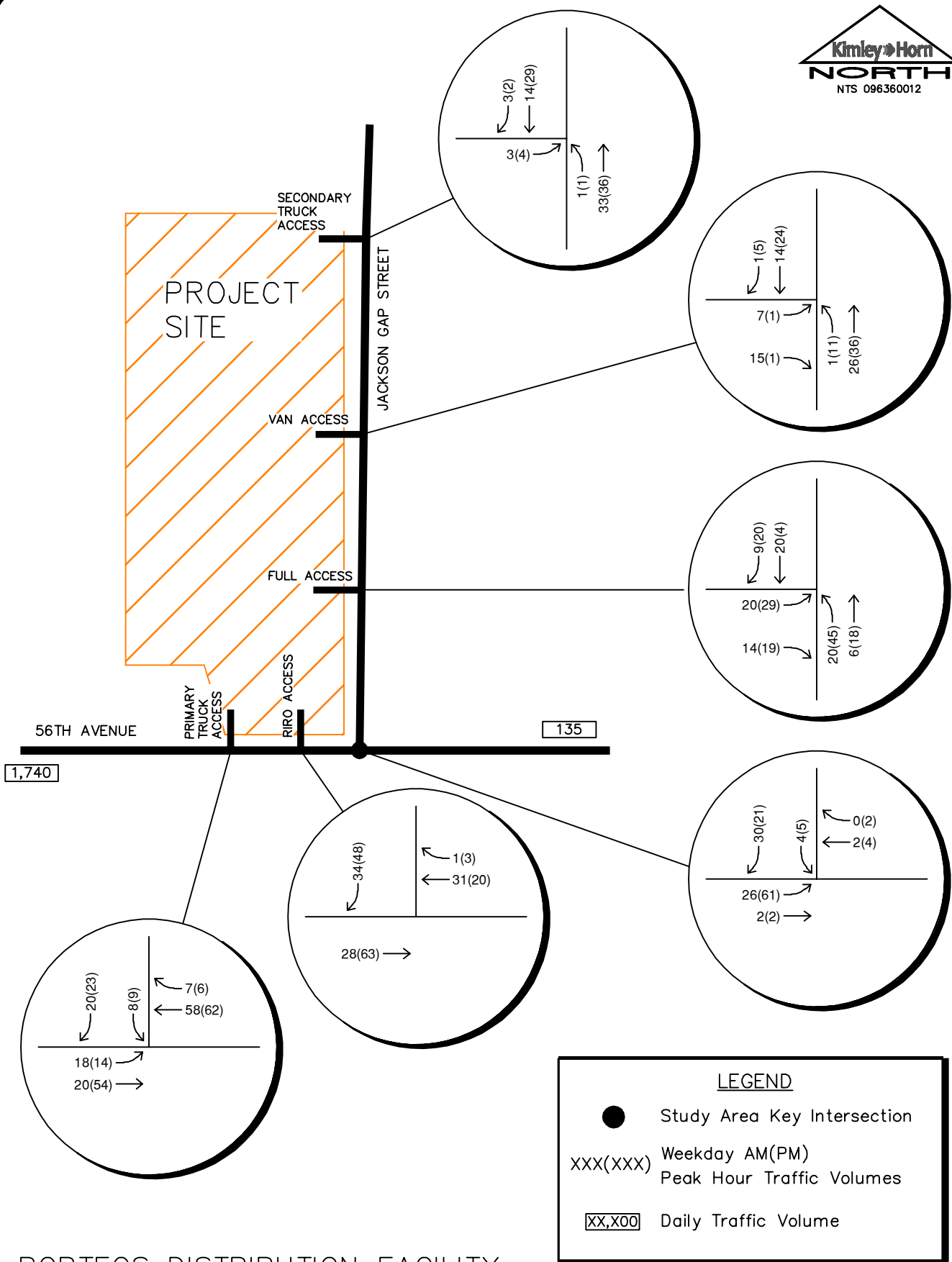
4.4 Total (Background Plus Project) Traffic

Site traffic volumes were added to the background volumes to represent estimated traffic conditions for the short term 2023 horizon and long term 2040 horizon. These total traffic volumes for the site are illustrated for the 2023 and 2040 horizon years in **Figures 9 and 10**, respectively.



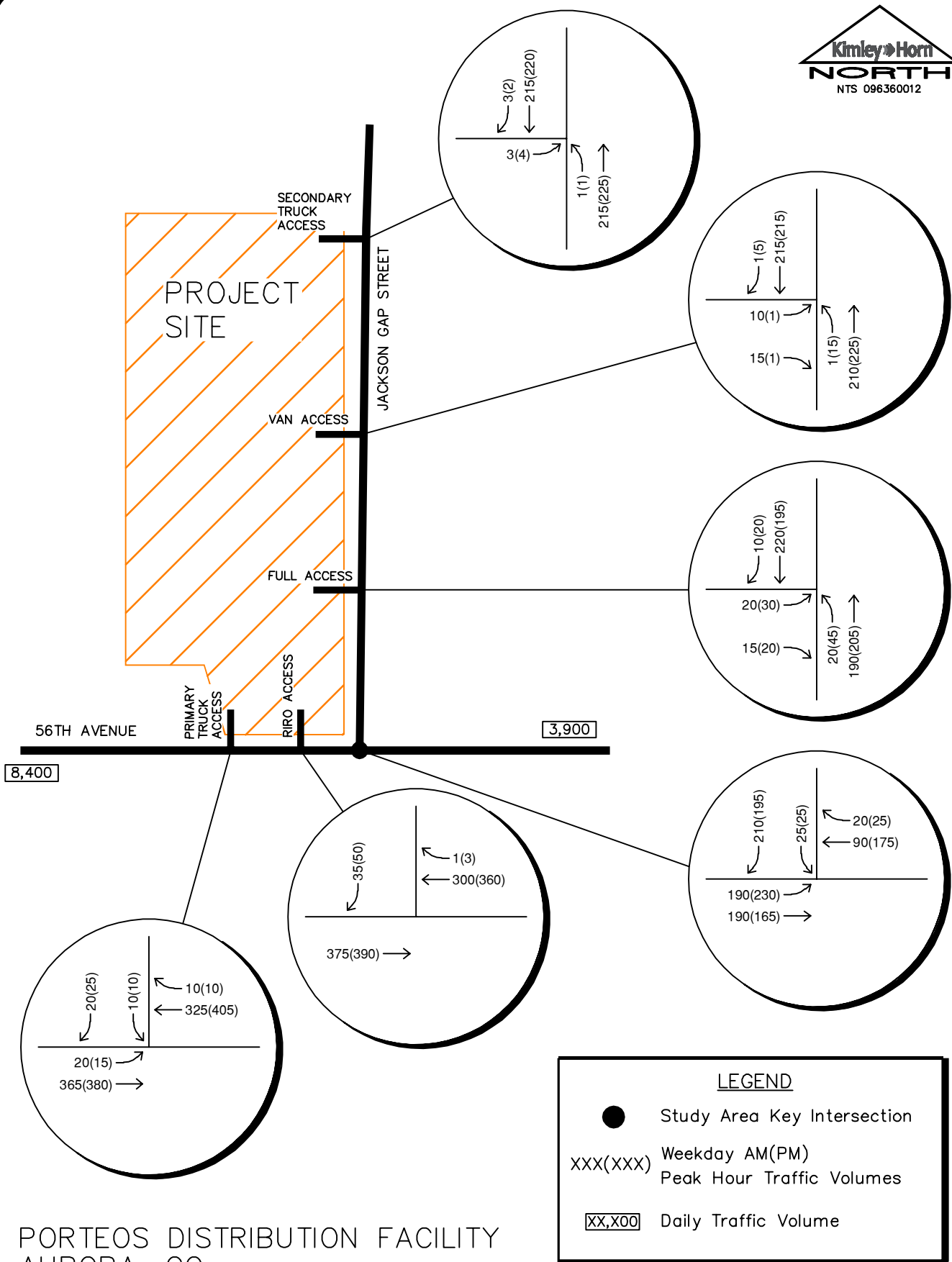
PORTEOS DISTRIBUTION FACILITY
AURORA, CO
PROJECT TRIP DISTRIBUTION

FIGURE 7



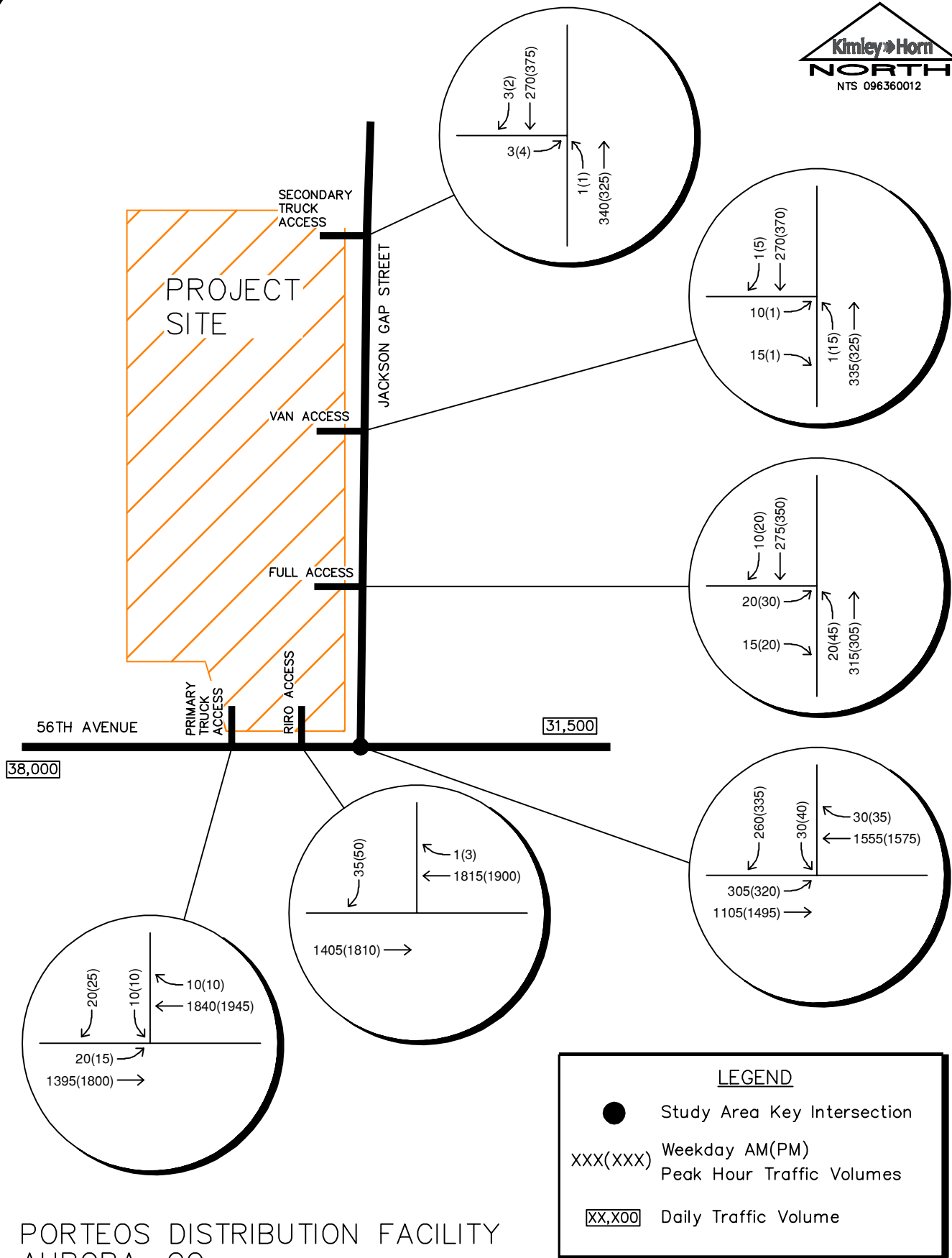
PORTEOS DISTRIBUTION FACILITY
 AURORA, CO
 PROJECT TRAFFIC ASSIGNMENT

FIGURE 8



PORTEOS DISTRIBUTION FACILITY
AURORA, CO
2023 BACKGROUND
PLUS PROJECT TRAFFIC VOLUMES

FIGURE 9



PORTEOS DISTRIBUTION FACILITY
 AURORA, CO
 2040 BACKGROUND
 PLUS PROJECT TRAFFIC VOLUMES

FIGURE 9

5.0 TRAFFIC OPERATIONS ANALYSIS

Kimley-Horn's analysis of traffic operations in the site vicinity was conducted to determine potential capacity deficiencies in the 2023 and 2040 development horizons at the identified key intersections and access driveways. The acknowledged source for determining overall capacity is the current edition of the *Highway Capacity Manual (HCM)*¹.

5.1 Analysis Methodology

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). According to City of Aurora guidelines for signalized intersections, individual movements may be allowed to fall to LOS E, but in most cases the overall intersection must operate (or be projected to operate) at a LOS D or better during AM and PM peak periods. If the existing LOS for an intersection is less than LOS D, discuss potential alternatives to improve the intersection to achieve LOS D or maintain the existing critical lane volume with the addition of site generated traffic. Minor movements at unsignalized intersections, such as left turns onto a major arterial from a side street, may be allowed to fall below LOS D pending the specific conditions. Movements which have a light traffic demand and a viable travel alternative may be allowed to fall below LOS D. **Table 2** shows the definition of level of service for signalized and unsignalized intersections.

Table 2 – Level of Service Definitions

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Definitions provided from the Highway Capacity Manual, Sixth Edition, Transportation Research Board, 2016.

¹ Transportation Research Board, *Highway Capacity Manual*, Sixth Edition, Washington DC, 2016.

Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections. Under the unsignalized analysis, the LOS for a two-way stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS for a two-way stop-controlled intersection is not defined for the intersection as a whole. LOS for a signalized and all-way stop controlled intersection is defined for each approach and for the overall intersection.

5.2 Key Intersection Operational Analysis

Calculations for the level of service at the key intersections and project access driveways for the study area are provided in **Appendix D**. The existing year analysis is based on the lane geometry and intersection control shown in **Figure 3**. Existing peak hour factors were used for the existing and 2023 conditions, while the recommended HCM urban peak hour factor of 0.92 averaged with the existing peak hour was used for the 2040 analysis. A heavy vehicle usage of 13 percent was utilized during the morning peak hours and 10 percent was utilized during the afternoon peak hours based on data collected. In addition, the in and out movements at the truck accesses were analyzed with a heavy vehicle percentage of 100 while the in and out movement at the van and passenger vehicle accesses were analyzed with a heavy vehicle usage of two (2) percent. Synchro traffic analysis software was used to analyze the study area intersections and access driveways. The Synchro Highway Capacity Manual (HCM) methodology reports were used to analyze intersection delay and level of service.

Jackson Gap Street and 56th Avenue

The existing T-intersection Jackson Gap Street and 56th Avenue is unsignalized and operates with stop control along the southbound Jackson Gap Street approach. Based on the turn lane analysis, an eastbound left turn lane is required to meet Aurora guidelines; therefore, the intersection has been analyzed with an eastbound left turn lane throughout the long-term 2040 horizon. All movements at this intersection currently operate acceptably with LOS B or better during the morning and afternoon peak hours. With the addition of project traffic, all movements at this intersection are expected to operate acceptably with LOS B or better during the peak hours in 2023. It is recommended that the southbound approach of Jackson Gap Street provides separate left and right turn lanes.

The Northeast Area Transportation Study (NEATS) Refresh identifies 56th Avenue as a six-lane facility (three through lanes in each direction) by year 2040. Therefore, 56th Avenue was studied with three through lanes in each direction at this intersection in 2040. With the recommended lane configurations, all movements at this intersection are expected to continue to operate acceptably during the peak hours in 2040. **Table 3** provides the results of the level of service at this intersection.

Table 3 – Jackson Gap Street and 56th Avenue LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2020 Existing				
Eastbound Left	7.6	A	7.7	A
Southbound Approach	8.8	A	9.9	A
2023 Background#				
Eastbound Left	8.0	A	8.2	A
Southbound Left	17.2	C	17.0	C
Southbound Right	11.4	B	10.7	B
2023 Background Plus Project#				
Eastbound Left	8.1	A	8.4	A
Southbound Left	19.9	C	21.7	C
Southbound Right	12.3	A	11.0	B
2040 Background##				
Eastbound Left	17.5	C	13.8	B
Southbound Left	26.0	D	20.7	C
Southbound Right	20.7	C	21.6	C
2040 Background Plus Project##				
Eastbound Left	18.9	C	15.7	C
Southbound Left	31.1	D	26.4	D
Southbound Right	24.1	C	23.9	C

= Addition of an EBL and SBL Turn Lanes; ## = Provide Eastbound and Westbound Through Lanes

5.3 Project Access Operational Analysis

With completion of the Porteos Distribution Facility (Lot 10B), the site proposes two accesses along the north side of 56th Avenue and three accesses along the west side of Jackson Gap Street. The west access along 56th Avenue will be designated for trucks and proposes full movements while the east access along 56th Avenue will serve employees and be restricted to right-in/right-out movements. The three accesses along Jackson Gap Street propose to allow full turning movements with the south access designated for employee parking, the middle access serving the transport vans, and the north access being a secondary truck access. The project accesses are recommended to have a R1-1 “STOP” sign installed for the exiting approaches. For the right-in/right-out access along 56th Avenue, it is recommended a R3-2 No Left Turn sign be placed underneath the STOP sign on the southbound driveway approach. In addition, a “Pork Chop” island is recommended to be installed at this access per City of Aurora requirements. Due to the absence of a raised median within 56th Avenue, a R3-2 No Left Turn sign should be placed on the northeast corner of the right-in/right-out access intersection, visible to eastbound drivers along 56th Avenue to restrict entering left turn movements. The truck access along 56th Avenue will require a designated eastbound left turn lane. The south access along Jackson Gap Street will require a northbound left turn lane. Single lanes should be sufficient on the exiting approaches at all five accesses; however, providing separate left and right turn lanes for exiting could be considered at the full movement accesses.

With the recommended lane configurations and control, all movements at the access intersections are expected to operate acceptably with LOS C or better during the peak hours throughout 2040. **Table 4** provides the results of the level of service at this intersection.

Table 4 – Porteos Distribution Facility Access LOS Results

Intersection	2023 Background Plus Project				2040 Background Plus Project			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
56th Avenue West Access (Trucks)								
Eastbound Left	9.6	A	10.0	A	12.9	B	13.4	B
Southbound Approach	15.6	C	16.9	C	16.1	C	17.5	C
56th Ave East Access (Employees)								
Southbound Right	10.3	B	11.0	B	12.8	B	13.7	B
Jackson Gap Street South Access (Employees)								
Northbound Left	7.8	A	7.8	A	7.9	A	8.2	A
Eastbound Approach	10.7	B	11.1	B	11.6	B	12.8	B
Jackson Gap Street Middle Access (Van Access)								
Northbound Left	7.7	A	7.7	A	7.8	A	8.2	A
Eastbound Approach	10.5	B	10.8	B	11.6	B	12.9	B
Jackson Gap Street North Access (Truck Access)								
Northbound Left	8.9	A	8.9	A	9.2	A	9.7	A
Eastbound Approach	13.9	B	14.1	B	17.0	C	19.0	C

5.4 Turn Lane Requirement Analysis

The City of Aurora currently adheres to the Colorado Department of Transportation (CDOT) State Highway Access Code (SHAC) guidelines to determine if turn lanes are warranted for intersections within the project limits. CDOT classifies their state highways based on roadway types. The Non-Rural Arterial Category NR-B (moderate travel speeds and relatively moderate to high traffic volumes) was assigned to 56th Avenue based on matching the characteristics of the CDOT roadways and the Non-Rural Arterial Category NR-C (low to moderate travel speeds and moderate volumes) was assigned to Jackson Gap Street.

According to the State Highway Access Code for category NR-B and NR-C roadways, the following thresholds apply for an auxiliary lane:

- A left turn lane with storage length plus taper is required for any access with a projected peak hour left ingress turning volume greater than 25 vehicles per hour (vph). If the posted speed limit is greater than 40 miles per hour, a deceleration lane and taper is required for any access with a projected peak hour left ingress turning volumes greater than 10 vph. The taper length will be included within the deceleration length.

- A right turn lane with storage length plus taper is required for any access with a projected peak hour right ingress turning volume greater than 50 vehicles per hour (vph). If the posted speed limit is greater than 40 miles per hour, a right turn lane deceleration lane and taper is required for any access with a project peak hour right ingress turning volume greater than 25 vehicles per hour.

56th Avenue currently has a posted speed limit of 45 miles per hour within the project limits. Based on the current speed limits and 2023 traffic volume projections, right turn lane and left turn lane requirements at the project intersections along 56th Avenue are as follows:

56th Avenue and Jackson Gap Street

- An eastbound left turn lane **is** warranted along 56th Avenue at the Jackson Gap Street intersection based on projected 2023 background plus project traffic volumes being 230 eastbound left turns during the peak hour and the threshold being greater than 10 vph. Based on a speed limit of 45 mph, a left turn deceleration length of 435 feet should be provided at this location. Since the taper length is incorporated within the deceleration lane length, an eastbound left turn lane length of 275 feet plus a 160-foot taper (13.5 to 1 ratio).
- A westbound right turn lane along 56th Avenue **is not** warranted at the 56th Avenue and Jackson Gap Street intersection based on projected 2023 background plus project traffic volumes being 25 westbound right turns during the peak hour and the threshold being greater than 25 vph.

56th Avenue and Truck Access

- An eastbound left turn lane **is** warranted along 56th Avenue at the Truck Full Access intersection based on projected 2023 background plus project traffic volumes being 20 eastbound left turns during the peak hour and the threshold being greater than 10 vph. Based on a speed limit of 45 mph, a left turn deceleration length of 435 feet should be provided at this location. Since the taper length is incorporated within the deceleration lane length, an eastbound left turn lane length of 275 feet plus a 160 foot taper (13.5 to 1 ratio).
- A westbound right turn lane along 56th Avenue **is not** warranted at the 56th Avenue and Truck Full Access intersection based on projected 2023 background plus project traffic

volumes being 10 westbound right turns during the peak hour and the threshold being greater than 25 vph.

56th Avenue and Employee RIRO Access

- A westbound right turn lane along 56th Avenue **is not** warranted at the 56th Avenue and Employee right-in/right-out access intersection based on projected 2023 background plus project traffic volumes being three (3) westbound right turns during the peak hour and the threshold being greater than 25 vph.

Jackson Gap Street currently has a posted speed limit of 40 miles per hour within the project limits. Based on the current speed limits and 2023 traffic volume projections, right turn lane and left turn lane requirements at the project intersections along Jackson Gap Street are as follows:

Jackson Gap Street and Employee Full Access

- A northbound left turn lane **is** warranted along Jackson Gap Street at the Employee Full Access intersection based on projected 2023 background plus project traffic volumes being 45 northbound left turns during the peak hour and the threshold being greater than 25 vph. Based on a speed limit of 40 mph, the requirement for this left turn lane is storage length plus taper. The storage length requirement is one foot per turning vehicle movement during the peak hour. This equates to 45 feet of storage length based on projected 2023 background plus project traffic volumes being 45 northbound left turns during the peak hour; however, a City of Aurora minimum left turn storage length of 150 feet plus a 100-foot taper should be provided at this location.
- A southbound right turn lane along Jackson Gap Street **is not** warranted at the Employee Full Access intersection based on projected 2023 background plus project traffic volumes being 20 southbound right turns during the peak hour and the threshold being greater than 50 vph.

Jackson Gap Street and Van Access

- A northbound left turn lane **is not** warranted along Jackson Gap Street at the Van Access intersection based on projected 2023 background plus project traffic volumes being 15 northbound left turns during the peak hour and the threshold being greater than 25 vph.

- A southbound right turn lane along Jackson Gap Street **is not** warranted at the Van Access intersection based on projected 2023 background plus project traffic volumes being five (5) southbound right turns during the peak hour and the threshold being greater than 50 vph.

Jackson Gap Street and Secondary Truck Access

- A northbound left turn lane **is not** warranted along Jackson Gap Street at the Secondary Truck Access intersection based on projected 2023 background plus project traffic volumes being one (1) northbound left turn during the peak hour and the threshold being greater than 25 vph.
- A southbound right turn lane along Jackson Gap Street **is not** warranted at the Secondary Truck Access intersection based on projected 2023 background plus project traffic volumes being three (3) southbound right turn during the peak hour and the threshold being greater than 50 vph.

5.5 Turn Bay Vehicle Queuing Analysis

A vehicle queuing analysis was conducted for turn lanes at the study area intersections. The queuing analysis was performed using the Synchro analysis software presenting the results of the 95th percentile queue length. Results of the vehicle queuing analysis are shown in the following **Table 5** with calculations provided in the intersection operational outputs located in **Appendix D**.

Table 5 – Turn Lane Length Analysis Results

Intersection Turn Lane	Existing Turn Lane Length (feet)	2023 Calculated Queue Length (feet)	2023 Recommended Turn Lane Length (feet)	2040 Calculated Queue Length (feet)	2040 Recommended Turn Lane Length (feet)
Jackson Gap St & 56th Avenue					
Eastbound Left	DNE	25'	150' (275')	100'	150' (275')
Southbound Left	DNE	25'	150' (25')	125"	150' (50')
56th Avenue West Access (Trucks)					
Eastbound Left	DNE	50'	150' (275')	50'	150' (275')
Southbound Approach	DNE	50'	50'	100'	100'
Jackson Gap Street South Access (Employees)					
Northbound Left	DNE	25'	150' (50')	25'	150' (50')
Eastbound Approach	DNE	25'	50'	25'	50'
Jackson Gap Street Middle Access (Van Access)					
Eastbound Approach	DNE	25'	50'	25'	50'
Jackson Gap Street North Access (Trucks)					
Eastbound Approach	DNE	50'	50'	50'	50'

XXX' = 95th Queues or City of Aurora Minimum Length Standard (XXX' = CDOT Length Requirement)

DNE = Does Not Exist

As shown in the queuing table, turn lanes currently do not exist at the key intersection, but all new auxiliary turn lanes should be constructed and designated with the lengths reported in **Table 5**.

Based on the results of the intersection operational and turn lane analysis, the recommended lane configurations and control of the study key intersections are shown for the 2023 project buildout year in **Figure 11** and for the 2040 long term horizon in **Figure 12**.

5.6 Gated Queue Analysis

The project proposes three gate stations for entering and exiting the two truck accesses and van delivery area. Therefore, a gated entry vehicle queuing analysis was performed to ensure trucks and delivery vans will not spillback into the public streets.

The truck access along 56th Avenue will have a gate station located approximately 550 feet from the driveway entrance while the truck access along Jackson Gap Street will have a gate station located approximately 100 feet from the driveway entrance. During the peak hour of the generator (not the peak hour of the adjacent street), a maximum of 51 trucks are anticipated to

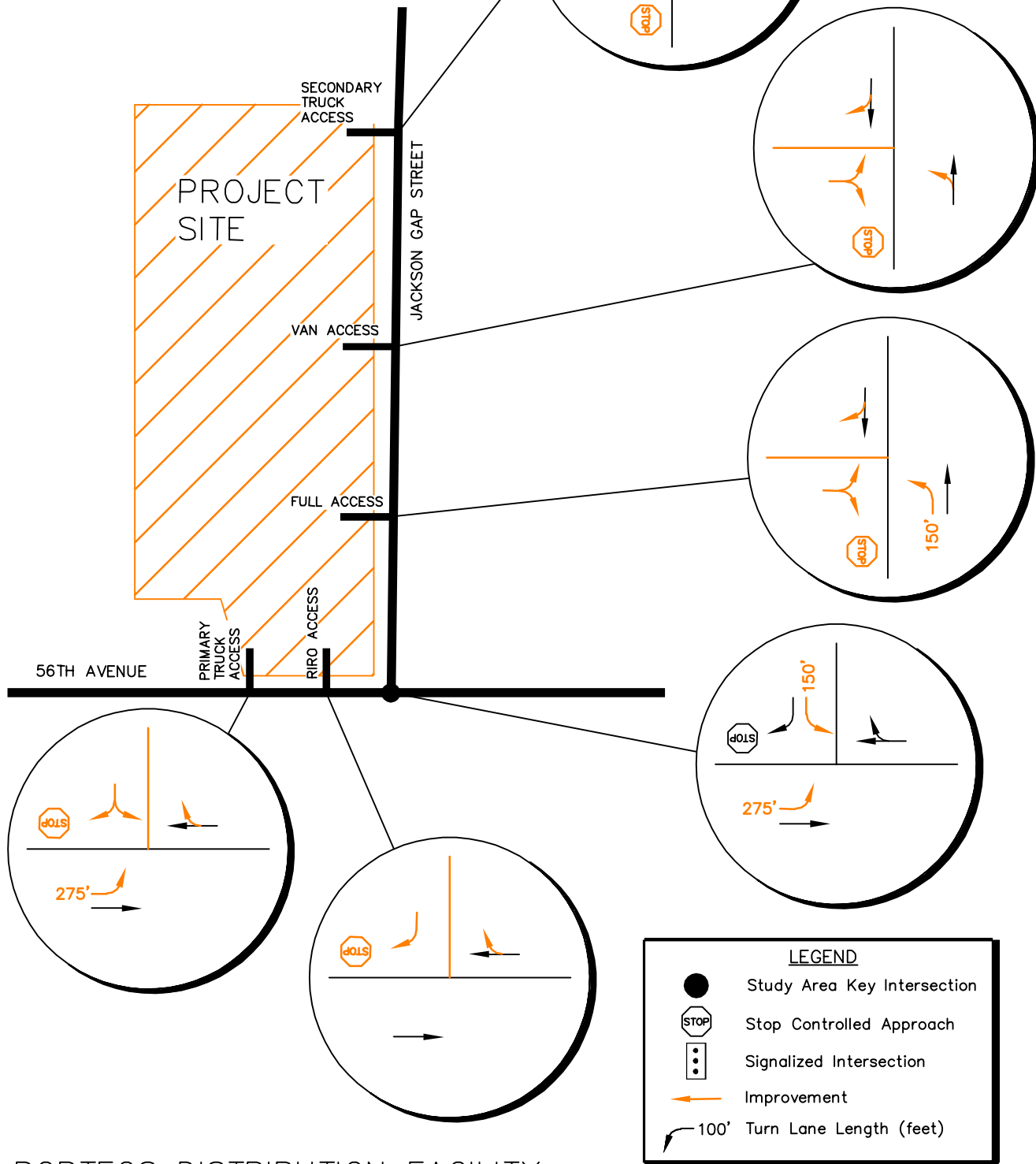
enter the facility. For the purpose of this analysis, 41 trucks were assigned to the primary truck access along 56th Avenue and 10 trucks were assigned to the secondary truck access along Jackson Gap Street. This volume was used to analyze the queuing storage requirements. Since it is unreasonable to assume that vehicles will arrive at a constant rate throughout the truck peak hour, a Poisson distribution storage equation was used to account for the variations in arrival rates. A service rate of 120 seconds per truck was utilized within the queuing analysis as the time identified at the window. It should be noted that dwell times for gates is unknown and estimates have been provided based on operational parameters. The dwell times utilized are considered to be conservative for the purposes of this analysis. Based on these volumes and service rate, it was calculated that a storage length of six (6) WB-67 truck (67 feet) is needed on site prior to the primary truck gate station and a storage length of one (1). Therefore, it is anticipated that the truck queueing will be sufficiently accommodated on site without negative impact.

It is anticipated that 15 delivery vehicles will arrive to the van access gated entry during the peak hour of the generator based on the trip generation calculations. This volume was used to analyze the queuing storage requirements. A service rate of 30 seconds per van was utilized within the queuing analysis as the time identified scanning an entry card. Based on these volumes and service rate, it was calculated that a storage length of one van (30 feet) is needed on site prior to the gate station; therefore, it is anticipated that the van queueing will be sufficiently accommodated on site without negative impact. Based on City of Aurora requirements, it is recommended that the gate to the van access be located 60 feet (two vehicle lengths) west of the Jackson Gap Street (measured from edge of pavement).

The gated entry vehicle queuing worksheets are included in **Appendix E**.

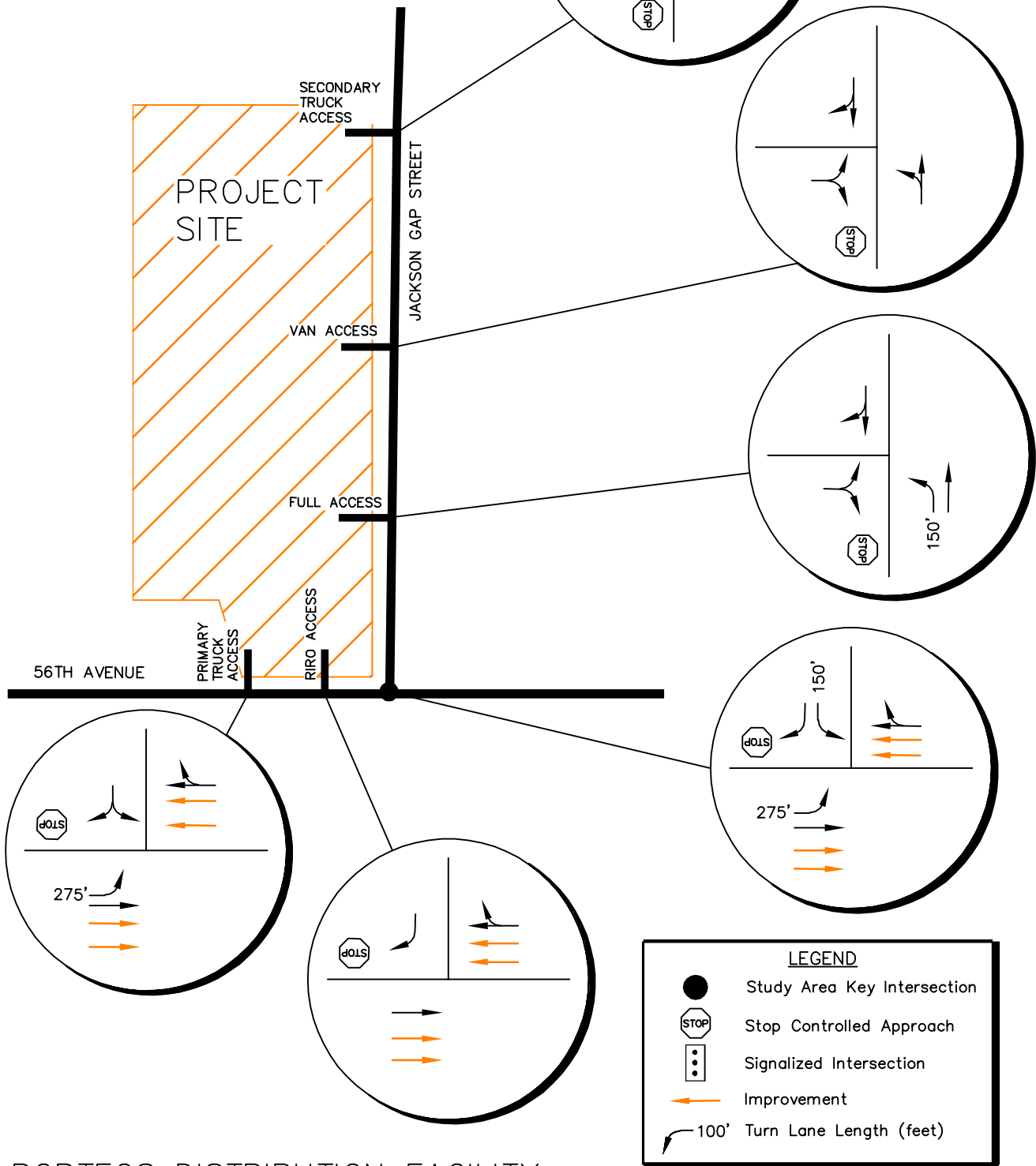
5.7 Pedestrian, Bicycle, and Transit Evaluation

To address components of full transportation and mobility operations, pedestrian, bicycle, and transit evaluations were conducted. There are not any sidewalk facilities currently along 56th Avenue and Jackson Gap Street. Sidewalks are planned for construction by others as part of Jackson Gap Street and 56th Avenue planned improvements. 56th Avenue and Jackson Gap Street do not currently provide bike lane facilities. The nearest transit operations to the site include the RTD 61st and Pena Station which runs the A-Line in the area.



PORTEOS DISTRIBUTION FACILITY
 AURORA, CO
 2023 RECOMMENDATIONS

FIGURE 11



PORTEOS DISTRIBUTION FACILITY
 AURORA, CO
 2040 RECOMMENDATIONS

FIGURE 12

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis presented in this report, Kimley-Horn believes the proposed Porteos Distribution Facility (Lot 10B) will be successfully incorporated into the existing and future roadway network. The proposed project development and expected traffic volumes resulted in the following recommendations and conclusions:

- With completion of the Porteos Distribution Facility (Lot 10B), the site proposes two accesses along the north side of 56th Avenue and three accesses along the west side of Jackson Gap Street. The west access along 56th Avenue will be designated for trucks and proposes full movements while the east access along 56th Avenue will serve employees and be restricted to right-in/right-out movements. The three accesses along Jackson Gap Street propose to allow full turning movements with the south access designated for employee parking, the middle access serving the transport vans, and the north access being a secondary truck access. The project accesses are recommended to have a R1-1 “STOP” sign installed for the exiting approaches. Single lanes should be sufficient on the exiting approaches at all five accesses; however, providing separate left and right turn lanes for exiting could be considered at the full movement accesses.
- The right-in/right-out access along 56th Avenue, it is recommended a R3-2 No Left Turn sign be placed underneath the STOP sign on the southbound driveway approach of the right-in/right-out access along 56th Avenue. In addition, a “Pork Chop” island is recommended to be installed at this access per City of Aurora requirements. Due to the absence of a raised median within 56th Avenue, a R3-2 No Left Turn sign should be placed on the northeast corner of the right-in/right-out access intersection, visible to eastbound drivers along 56th Avenue to restrict entering left turn movements.
- The truck access along 56th Avenue will require a designated eastbound left turn lane with a length of 275 feet. The south access along Jackson Gap Street will require a northbound left turn lane with a length of 150 feet.

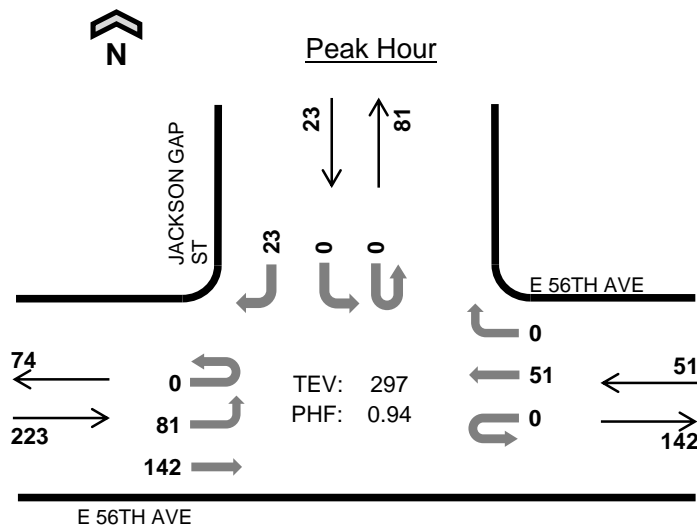
- An eastbound left turn lane with a length of 275 feet should be provided at the intersection of 56th Avenue and Jackson Gap Street while a southbound left turn lane with a length of 150 feet should be provided at this intersection.
- Any on-site and off-site signing and striping improvements should be incorporated into the Civil Drawings and conform to City of Aurora Standards as well as the Manual on Uniform Traffic Control Devices – 2009 Edition (MUTCD).

APPENDICES

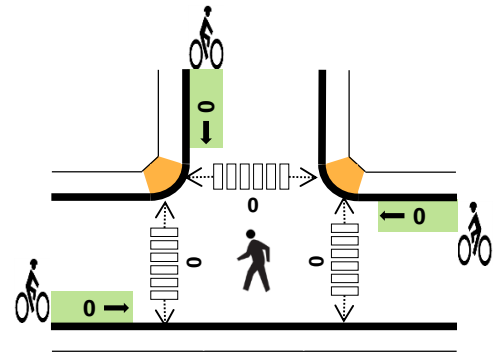
APPENDIX A

Intersection Count Sheets

JACKSON GAP ST E 56TH AVE



Date: Thu, Oct 08, 2020
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:15 AM to 8:15 AM



	HV %:	PHF
EB	10.3%	0.86
WB	15.7%	0.80
NB	-	-
SB	26.1%	0.52
TOTAL	12.5%	0.94

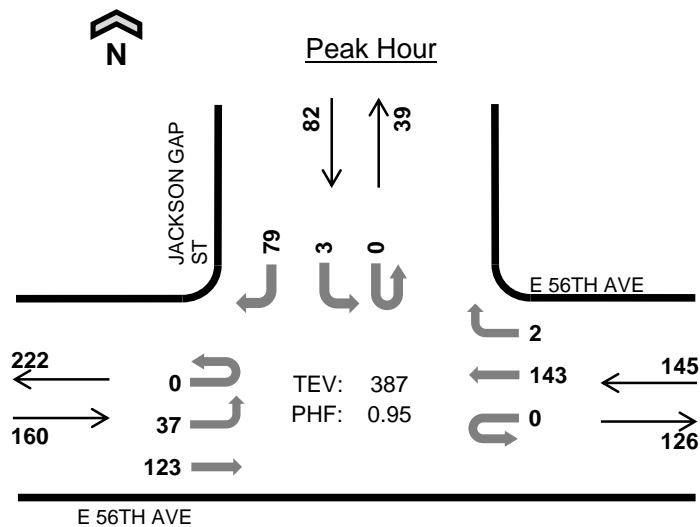
Two-Hour Count Summaries

Interval Start	E 56TH AVE Eastbound				E 56TH AVE Westbound				0 Northbound				JACKSON GAP ST Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	23	26	0	0	0	10	0	0	0	0	0	0	0	0	7	66	0
7:15 AM	0	19	34	0	0	0	13	0	0	0	0	0	0	0	0	6	72	0
7:30 AM	0	24	36	0	0	0	11	0	0	0	0	0	0	0	0	3	74	0
7:45 AM	0	18	47	0	0	0	11	0	0	0	0	0	0	0	0	3	79	291
8:00 AM	0	20	25	0	0	0	16	0	0	0	0	0	0	0	0	11	72	297
8:15 AM	0	9	28	0	0	0	11	1	0	0	0	0	0	0	0	7	56	281
8:30 AM	0	14	34	0	0	0	16	0	0	0	0	0	0	0	0	4	68	275
8:45 AM	0	9	41	0	0	0	13	0	0	0	0	0	0	0	0	6	69	265
Count Total	0	136	271	0	0	0	101	1	0	0	0	0	0	0	0	47	556	0
Peak Hour	0	81	142	0	0	0	51	0	0	0	0	0	0	0	0	23	297	0

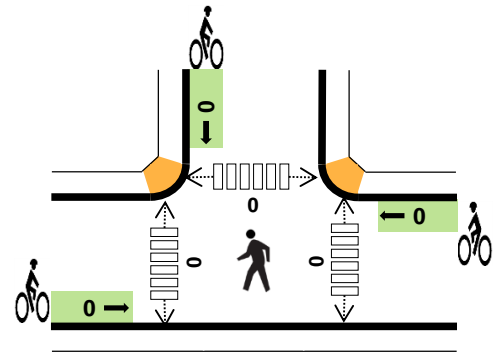
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

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	12	1	0	0	13	0	0	0	0	0	0	0	0	0	0
7:15 AM	5	1	0	0	6	0	0	0	0	0	0	0	0	0	0
7:30 AM	6	2	0	1	9	0	0	0	0	0	0	0	0	0	0
7:45 AM	5	3	0	1	9	0	0	0	0	0	0	0	0	0	0
8:00 AM	7	2	0	4	13	0	0	0	0	0	0	0	0	0	0
8:15 AM	4	4	0	1	9	0	0	0	0	0	0	0	0	0	0
8:30 AM	8	4	0	0	12	0	0	0	0	0	0	0	0	0	0
8:45 AM	8	3	0	2	13	0	0	0	0	0	0	0	0	0	0
Count Total	55	20	0	9	84	0	0	0	0	0	0	0	0	0	0
Peak Hr	23	8	0	6	37	0	0	0	0	0	0	0	0	0	0

JACKSON GAP ST E 56TH AVE



Date: Thu, Oct 08, 2020
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:00 PM to 5:00 PM



	HV %:	PHF
EB	8.8%	0.91
WB	9.0%	0.91
NB	-	-
SB	11.0%	0.89
TOTAL	9.3%	0.95

Two-Hour Count Summaries

Interval Start	E 56TH AVE Eastbound				E 56TH AVE Westbound				0 Northbound				JACKSON GAP ST Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	9	29	0	0	0	40	0	0	0	0	0	0	0	0	17	95	0
4:15 PM	0	13	31	0	0	0	35	1	0	0	0	0	0	1	0	21	102	0
4:30 PM	0	10	32	0	0	0	36	1	0	0	0	0	0	1	0	19	99	0
4:45 PM	0	5	31	0	0	0	32	0	0	0	0	0	0	1	0	22	91	387
5:00 PM	0	6	23	0	0	0	38	0	0	0	0	0	0	0	0	15	82	374
5:15 PM	0	3	18	0	0	0	25	0	0	0	0	0	0	0	0	13	59	331
5:30 PM	0	8	16	0	0	0	46	1	0	0	0	0	0	0	0	11	82	314
5:45 PM	0	5	29	0	0	0	31	1	0	0	0	0	0	2	0	17	85	308
Count Total	0	59	209	0	0	0	283	4	0	0	0	0	0	5	0	135	695	0
Peak Hour	0	37	123	0	0	0	143	2	0	0	0	0	0	3	0	79	387	0

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	3	4	0	1	8	0	0	0	0	0	0	0	0	0	0
4:15 PM	4	3	0	2	9	0	0	0	0	0	0	0	0	0	0
4:30 PM	5	3	0	3	11	0	0	0	0	0	0	0	0	0	0
4:45 PM	2	3	0	3	8	0	0	0	0	0	0	0	0	0	0
5:00 PM	2	2	0	1	5	0	0	0	0	0	0	0	0	0	0
5:15 PM	1	1	0	1	3	0	0	0	0	0	0	0	0	0	0
5:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	18	16	0	11	45	0	0	0	0	0	0	0	0	0	0
Peak Hr	14	13	0	9	36	0	0	0	0	0	0	0	0	0	0

Porteos Distribution Facility

Jackson Gap Street Through Volumes		
Scenario	AM Peak	PM Peak
2019 Existing (Pre-COVID - 2019-10-15)	111	133
2019 to 2020 Grown Existing	113	136
2020 Counts (During COVID - 2020-10-08)	104	121
Percent Change	-8.14%	-10.81%
Growth Adjustment	8.87%	12.12%
Adjustment Factor	1.09	1.12

APPENDIX B

Background Volume Information

Transportation Impact Study

Aurora Costco Depot

Aurora, Colorado

Prepared For:

Peter Kahn

AVP of Real Estate Corporation

Costco Wholesale Corporation

999 Lake Drive

Issaquah, WA 98027

Prepared By:

Kittelson & Associates, Inc.

101 South Capitol Boulevard, Suite 600

Boise, ID 83702

(208) 338-2683

Project Principal: Brian Ray, PE

Project Manager: Andy Daleiden, PE

Project Team: Lauren Hunt, Alicia Hunter, and Yihang Sui

Project No. 24055

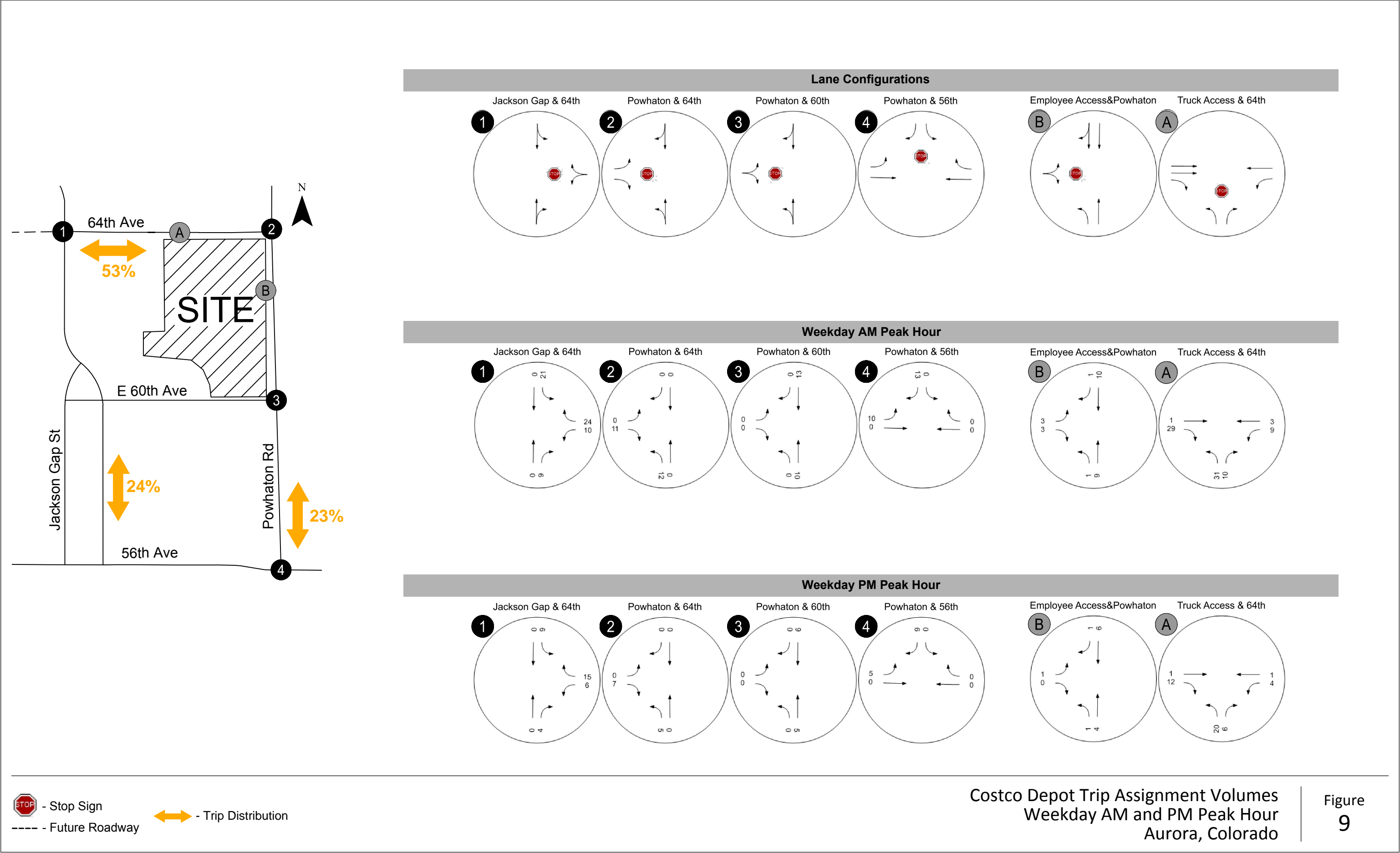
August 2019

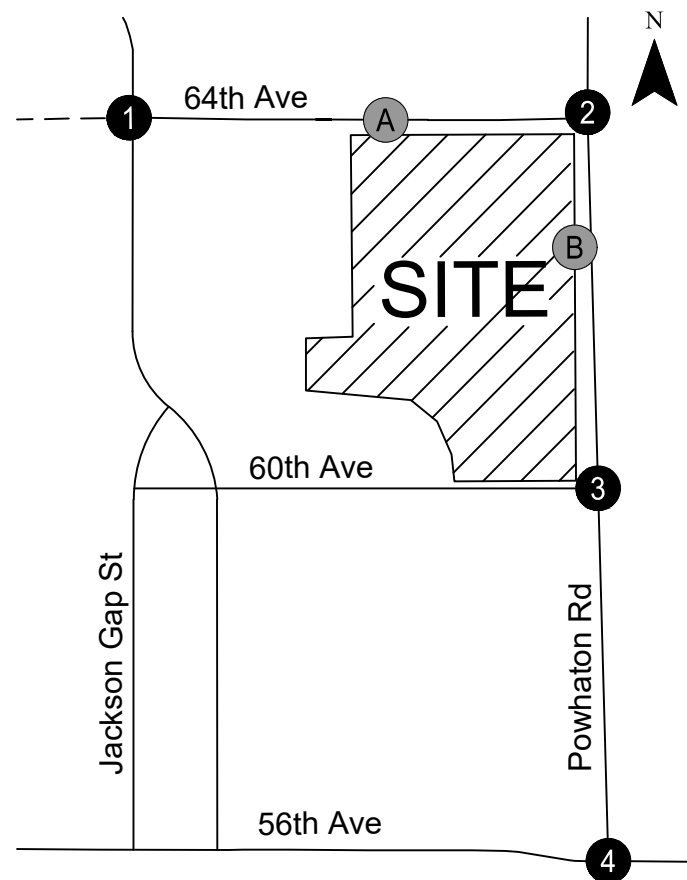


- All study access points are projected to operate acceptably at LOS D or better during the year 2020 total traffic conditions (weekday AM and PM peak hours).
 - The Manual on Uniform Traffic Control Devices (MUTCD, 9th Edition) eight-hour, four-hour, and peak-hour signal warrants are not met at the proposed access points on 64th Avenue and Powhatan Road.

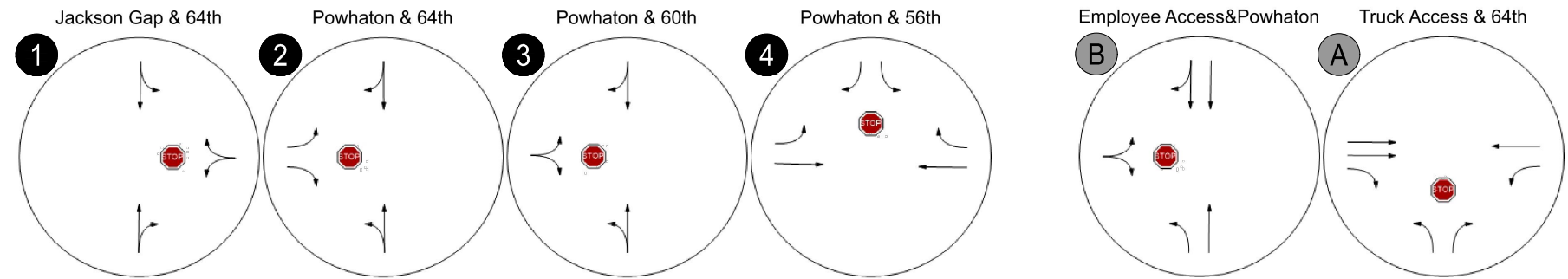
Year 2040 Background and Total Traffic Conditions

- Based on the Porteos Master Transportation Plan, NEATS Refresh, Groot Distribution Center TIS, and JAG Logistics Center at DIA TIS, there are several planned roadway improvements for 64th Avenue, 60th Avenue, 56th Avenue, Powhatan Road, and Jackson Gap Street. Additionally, traffic signals are planned at the following intersections: 64th Avenue/Jackson Gap Street, 64th Avenue/Powhatan Road, 60th Avenue/Powhatan Road, and 56th Avenue/Powhatan Road. These improvements are anticipated to accommodate the traffic volumes associated with the Porteos Master Plan, which includes the Costco Depot site as part of that plan.
- The Porteos Master Plan assumed a development size and trip generation of 1,322,900 square-feet and 7,280 daily trips for the planning area that includes the approved Groot Distribution Center and proposed Costco Depot sites. Based on the approved Groot Distribution Center TIS and proposed Costco Depot TIS, the total size of these two developments is 234,385 square-feet less than the development size assumed in the Porteos Master Plan. These two developments are estimated to generate 3,162 less daily trips than the trip generation assumed in the Porteos Master Plan. Therefore, the approved Groot Distribution Center and proposed Costco Depot will have a significantly smaller footprint and trip impact to the surrounding roadway network than estimated in the Porteos Master Plan for PA-7.
- The proposed Costco Depot and approved Groot Distribution Center daily traffic volumes are estimated to be less than what was assumed in the Porteos Master Plan TIS, NEATS Refresh, and JAG Logistics Center at DIA TIS. Therefore, the planned study area roadways are expected to have adequate capacity to accommodate the daily traffic volumes from the proposed Costco Depot.
- All study intersections are planned to be signalized by the year 2040. With traffic signals in place, all study intersections continue to operate acceptably at LOS D or better during the year 2040 background and total traffic conditions (weekday AM and PM peak hours).
 - The Manual on Uniform Traffic Control Devices (MUTCD, 9th Edition) eight-hour, four-hour, and peak-hour signal warrants are met at the study intersections.
- All study access points are projected to operate acceptably at LOS D or better during the year 2040 total traffic conditions (weekday AM and PM peak hours).
 - The Manual on Uniform Traffic Control Devices (MUTCD, 9th Edition) eight-hour, four-hour, and peak-hour signal warrants are not met at the proposed access points on 64th Avenue and Powhatan Road.

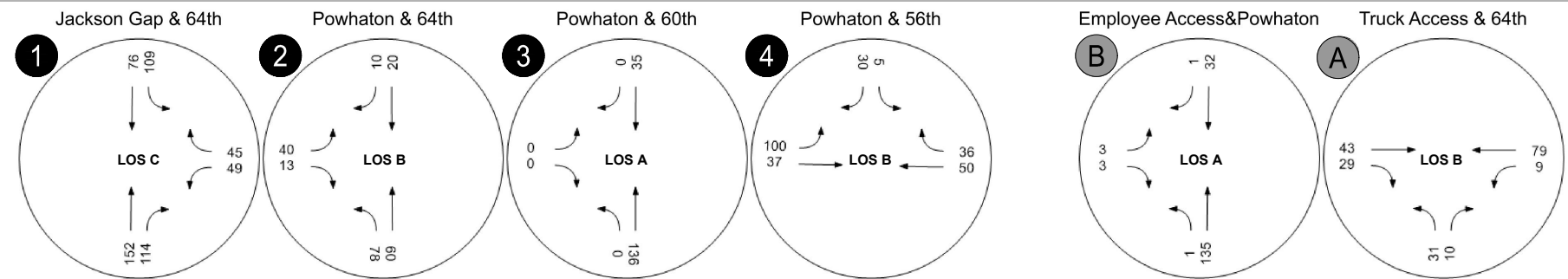
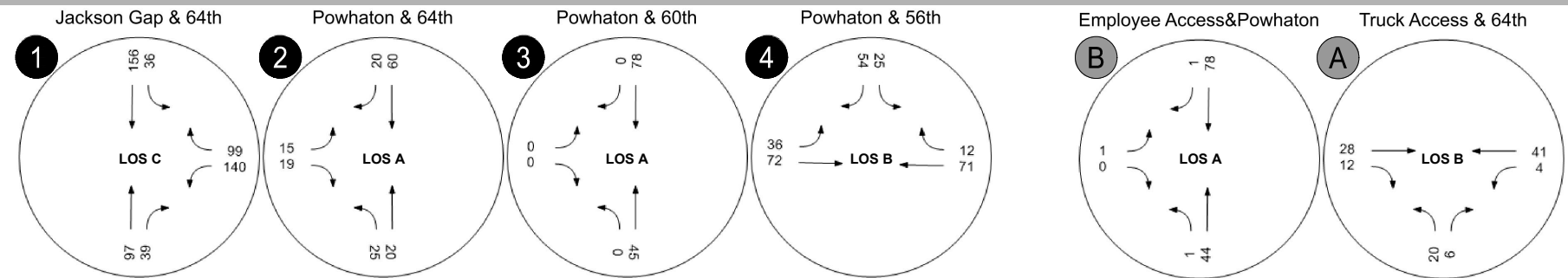




Lane Configurations



Weekday AM Peak Hour

**Weekday PM Peak Hour**

 - Stop Sign
---- - Future Roadway

Year 2020 Total Traffic Conditions
Weekday AM and PM Peak Hour
Aurora, Colorado

Figure
10



Figure
15

T R A F F I C I M P A C T S T U D Y

Ryder Truck Facility (Porteos Subdivision Filing 4)

Aurora Colorado

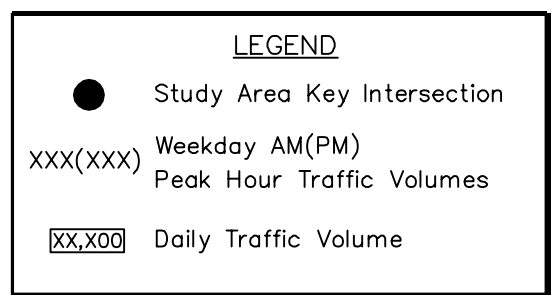
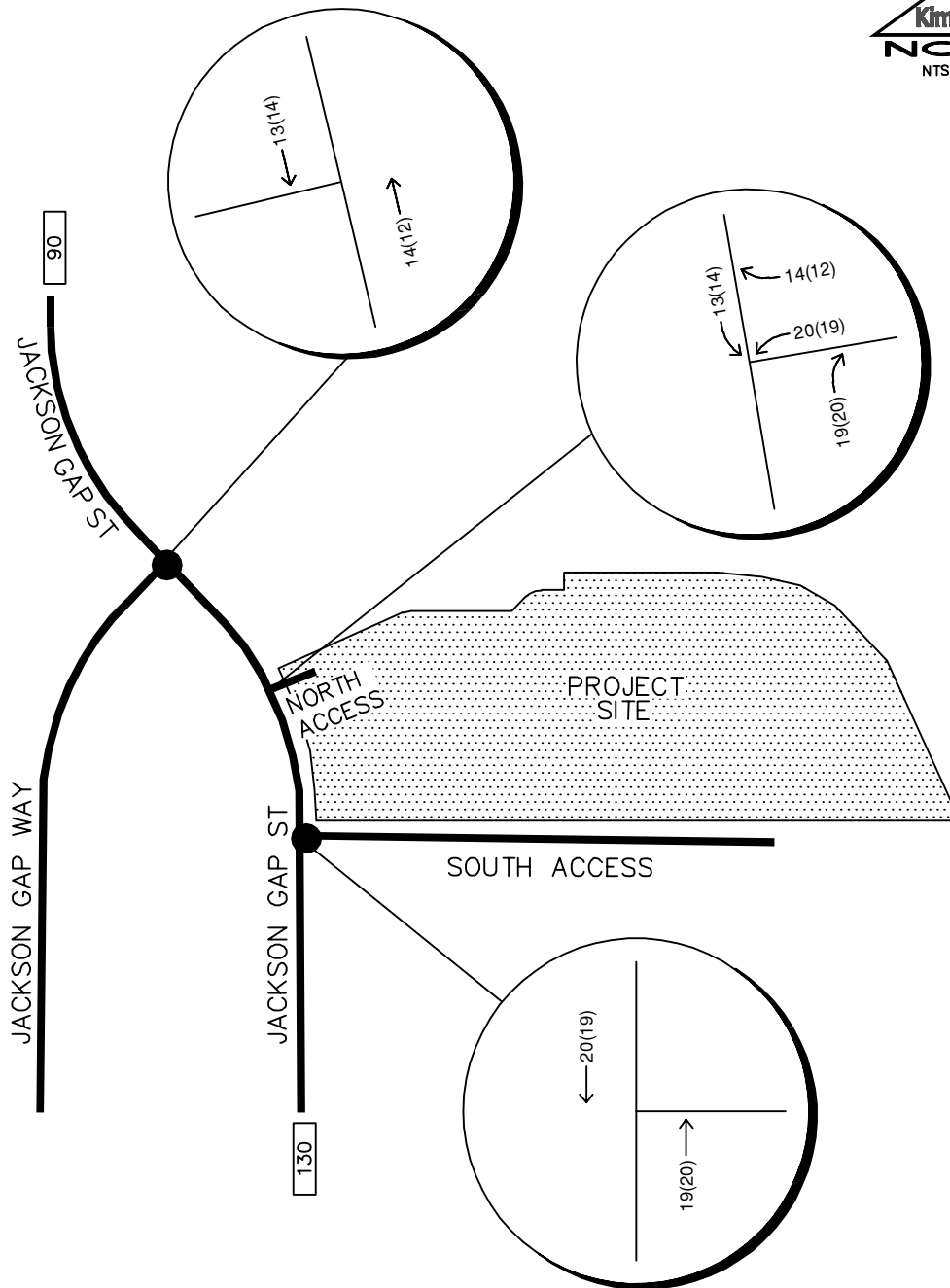
Prepared for
Ware Malcomb
100 S Broadway
Suite 200
Denver CO 80202

Prepared by
Kimley-Horn and Associates, Inc.
4525 South Ister Street
Suite 1500
Denver Colorado 80222
303-224-2000



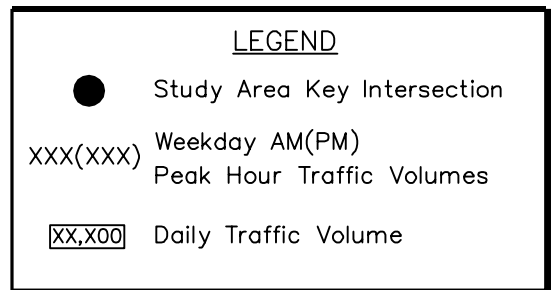
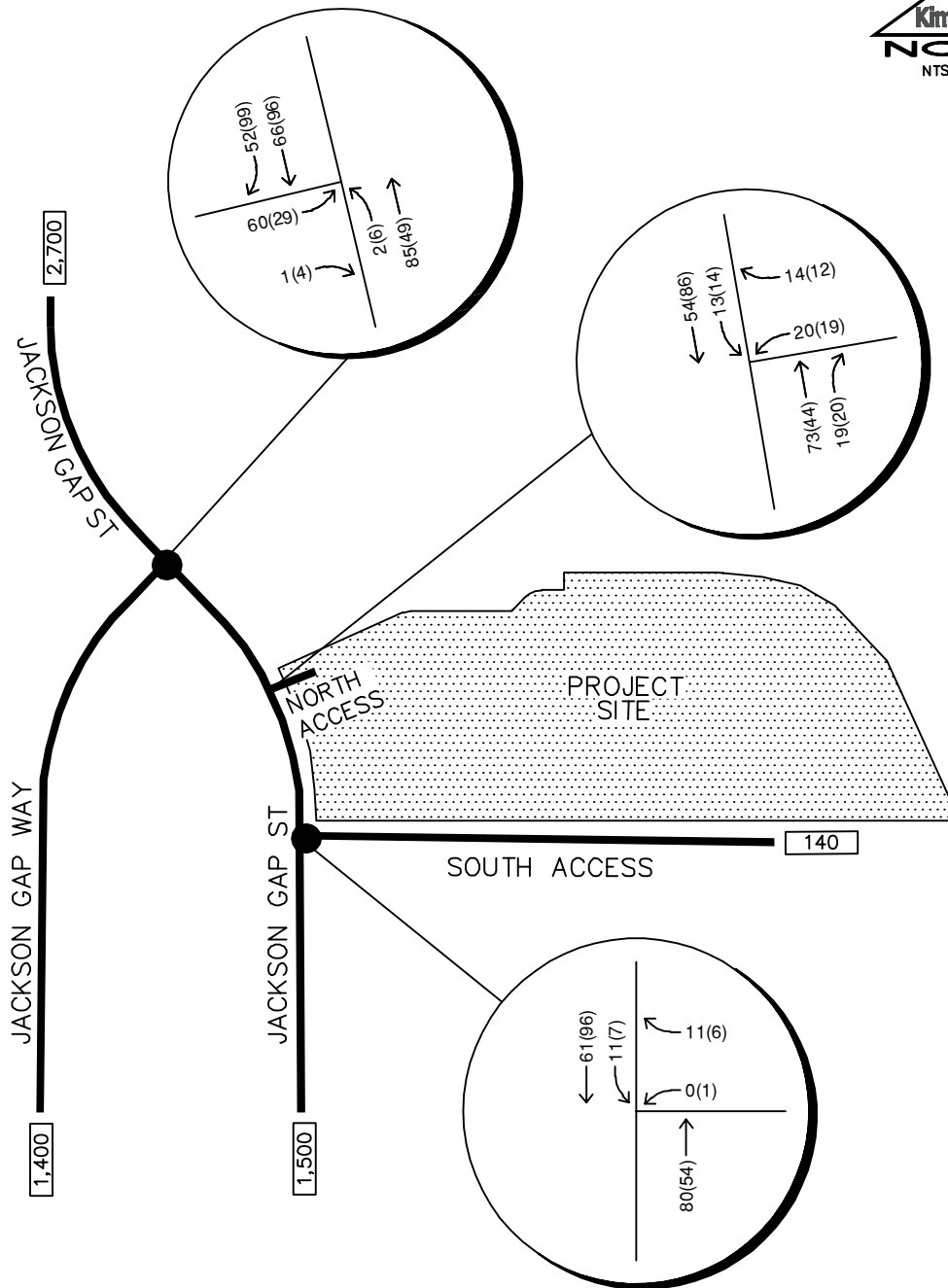
April 2020

This document, together with the concepts and designs presented herein, as an instrument of service, is intended only for the specific purpose and client for which it was prepared. Reuse of and improper reliance on this document without written authorization and adaptation by Kimley-Horn and Associates, Inc. shall be without liability to Kimley-Horn and Associates, Inc.



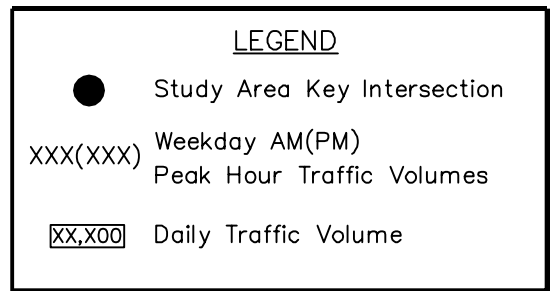
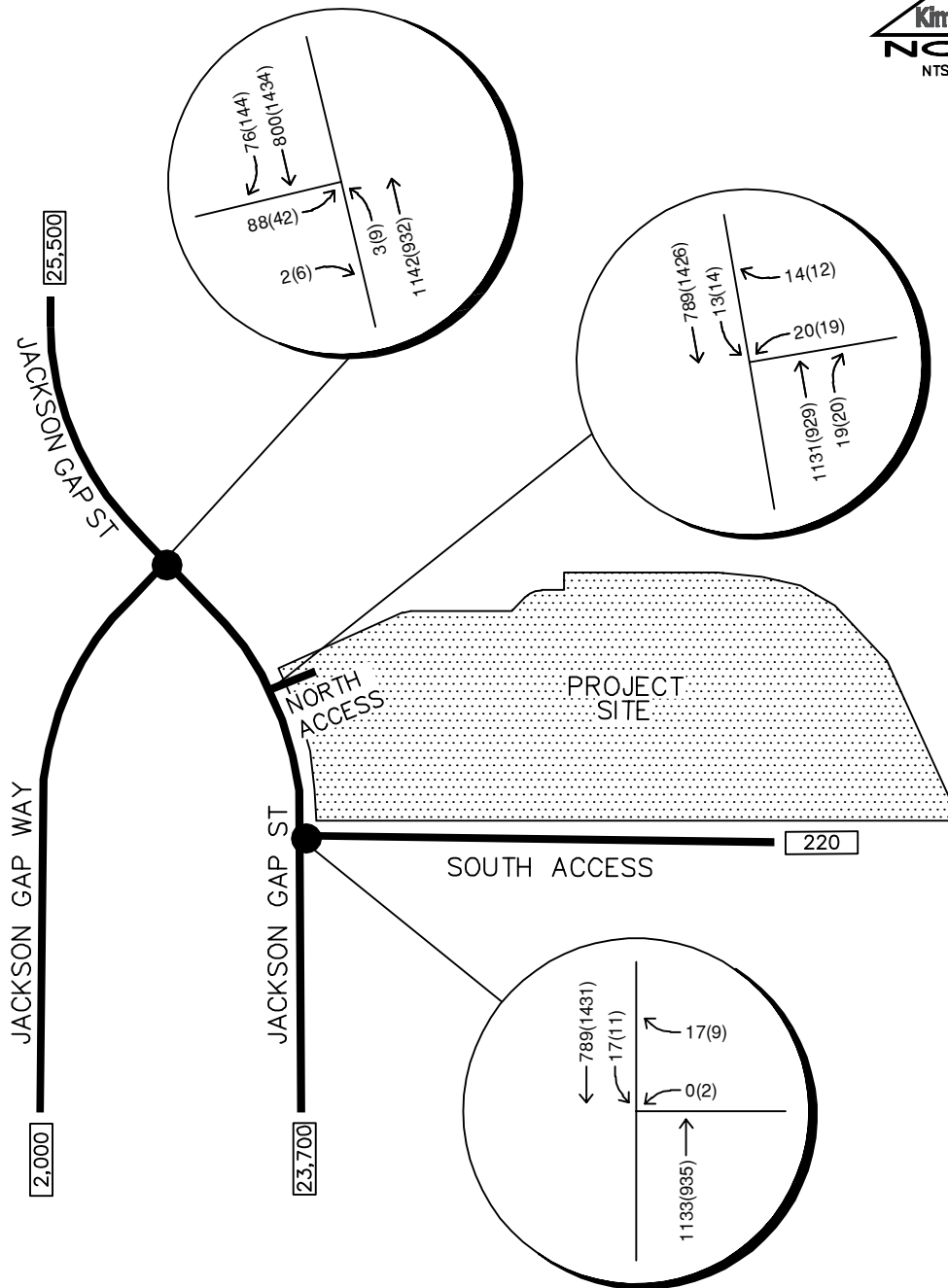
RYDER (PORTEOS SUBDIVISION FILING 4)
AURORA, CO
PROJECT TRAFFIC ASSIGNMENT

FIGURE 8



RYDER (PORTEOS SUBDIVISION FILING 4)
AURORA, CO
2021 BACKGROUND PLUS
PROJECT TRAFFIC VOLUMES

FIGURE 9



RYDER (PORTEOS SUBDIVISION FILING 4)
 AURORA, CO
 2040 BACKGROUND PLUS
 PROJECT TRAFFIC VOLUMES

FIGURE 10

TRANSPORTATION IMPACT STUDY

Porteos – Project Pearl in Aurora

Prepared for:

Ryan Companies
533 South Third Street, Suite 100
Minneapolis, MN 55415

Prepared by:

Felsburg Holt & Ullevig
6400 S Fiddlers Green Circle, Suite 1500
Greenwood Village, CO 80111
303.721.1440

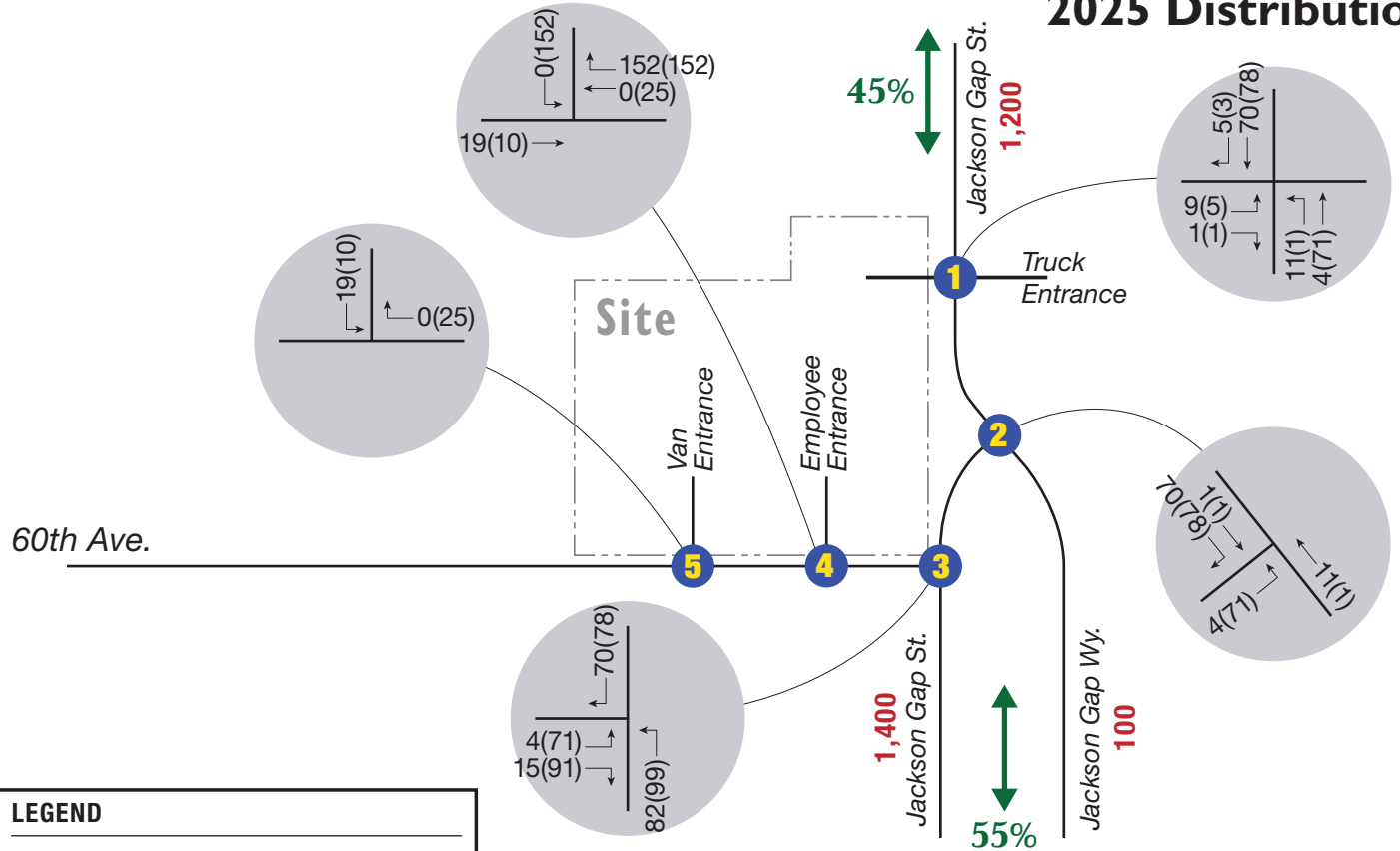
Principal: Christopher J. Fasching, PE, PTOE
Project Manager: Philip Dunham, PE, PTOE



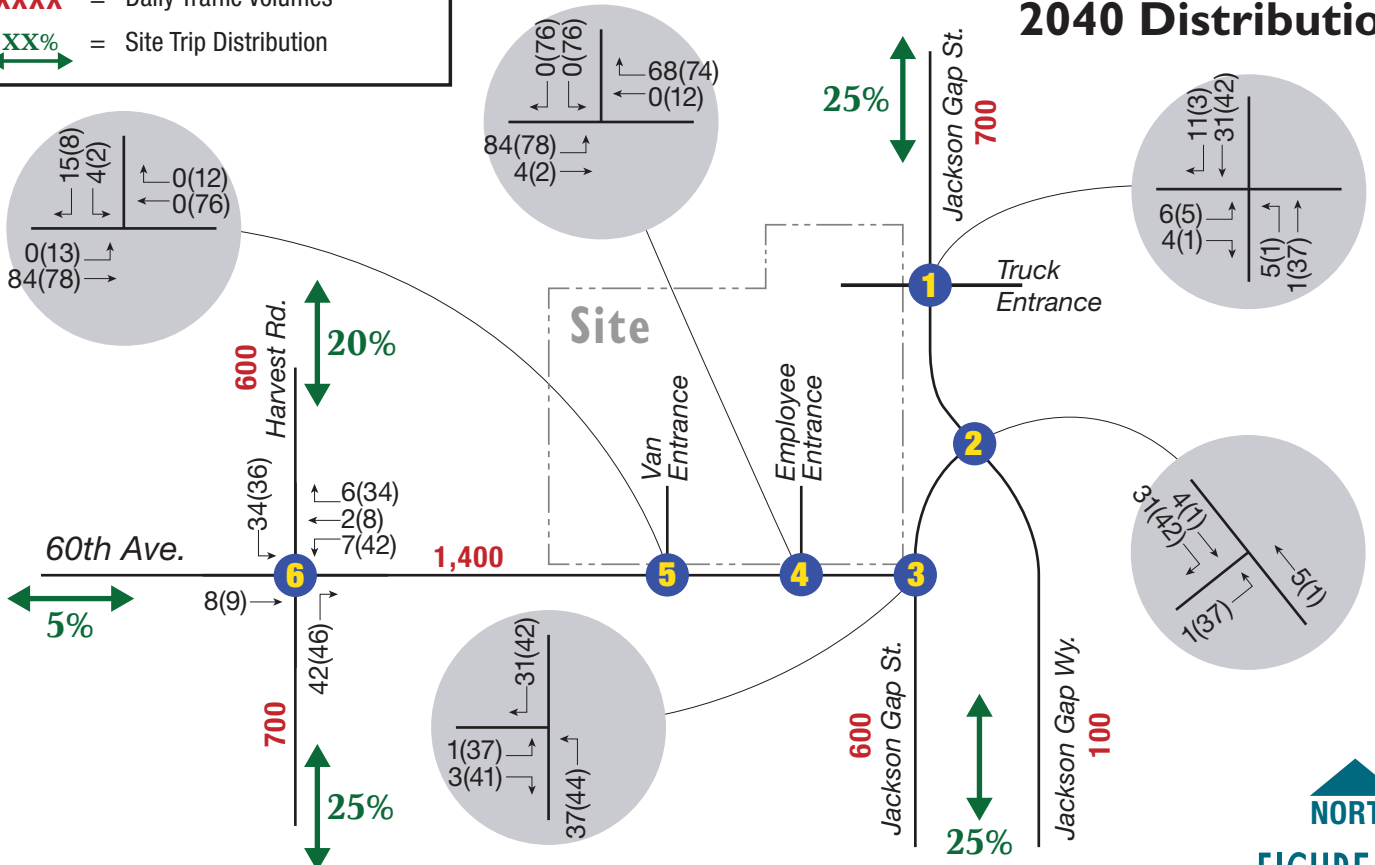
FHU Reference No. 120196-01

September 2020

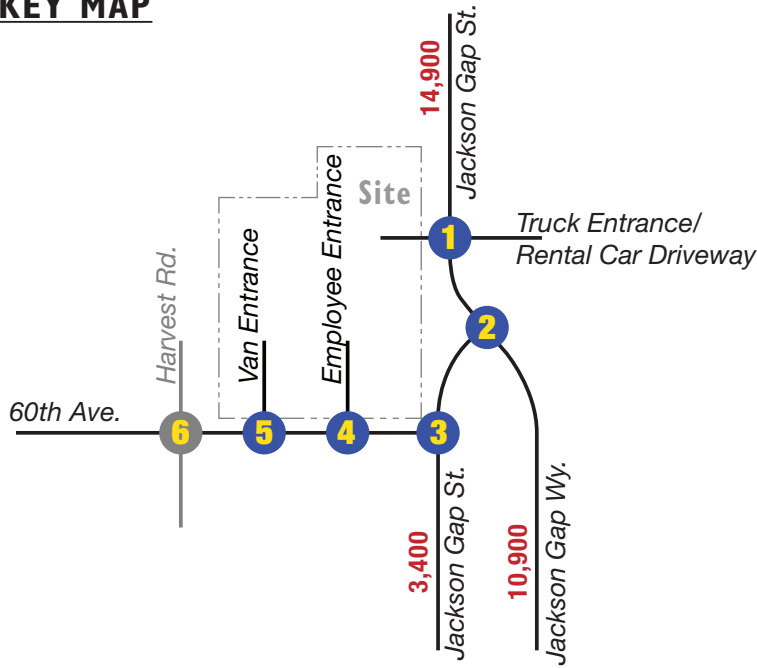
2025 Distribution



2040 Distribution



KEY MAP




LEGEND

XXX(XXX) = AM(PM) Peak Hour Traffic Volumes

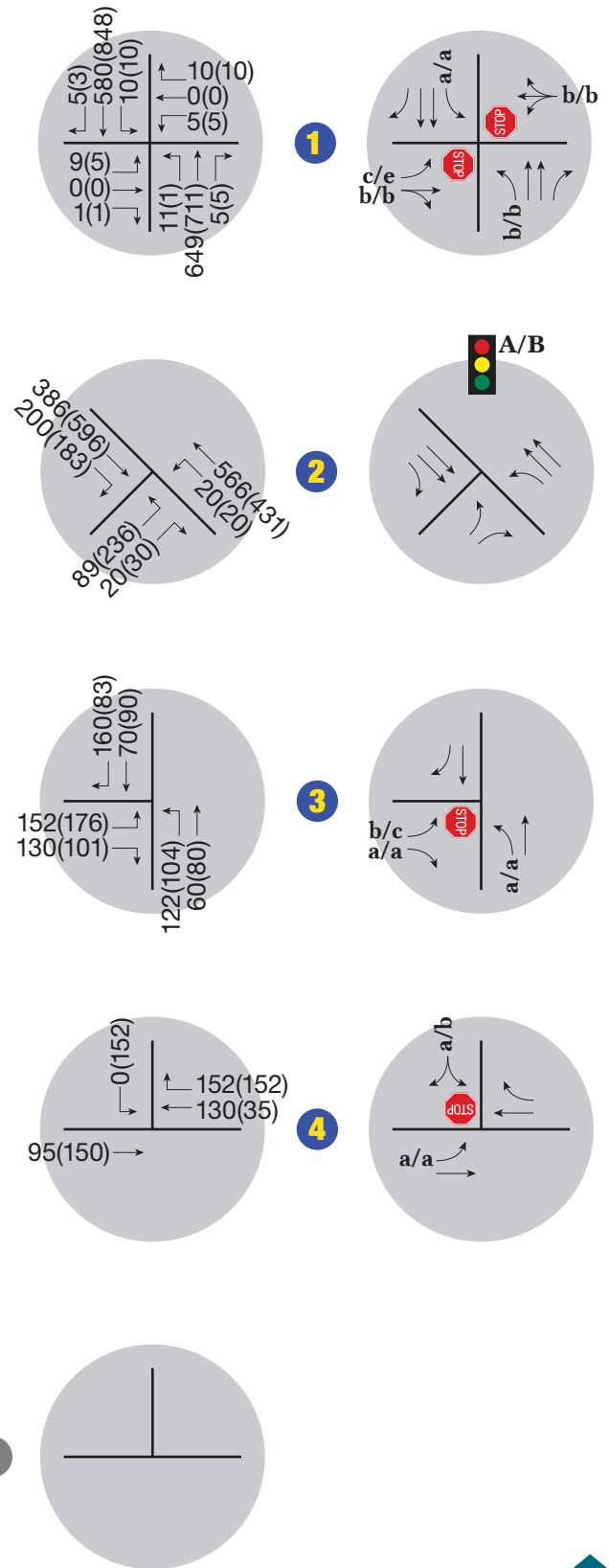
XXXX = Daily Traffic Volumes

X/X = AM/PM Peak Hour Signalized Intersection Level of Service

x/x = AM/PM Peak Hour Unsignalized Intersection Level of Service

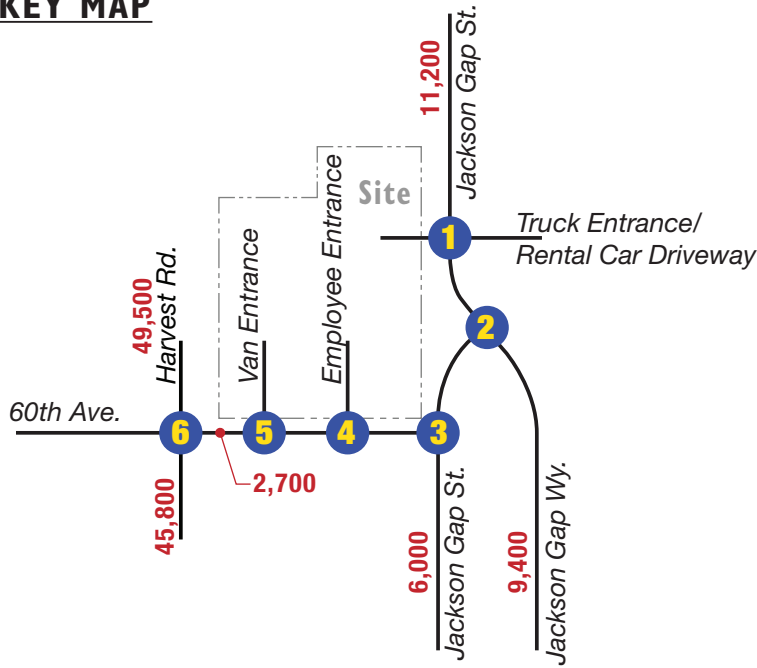
 = Stop Sign

 = Traffic Signal



NOTE: Drawing Not to Scale

KEY MAP



LEGEND

XXX(XXX) = AM(PM) Peak Hour Traffic Volumes

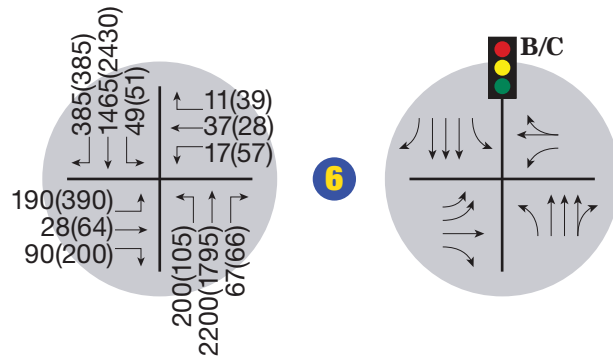
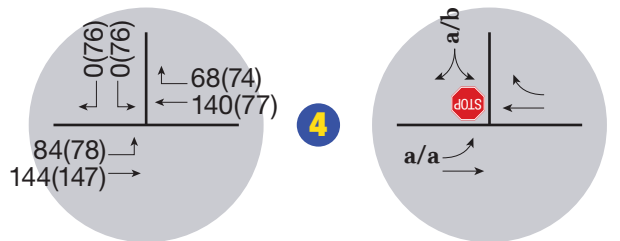
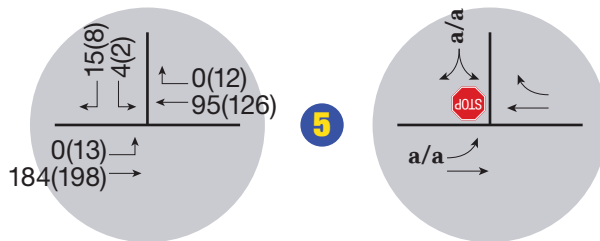
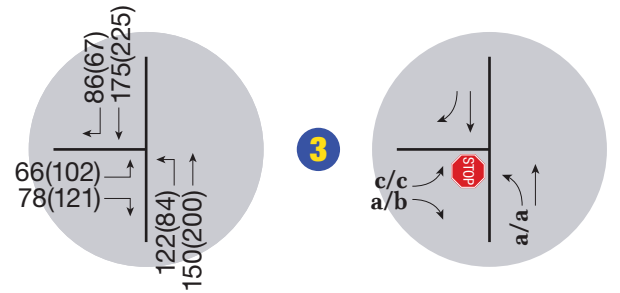
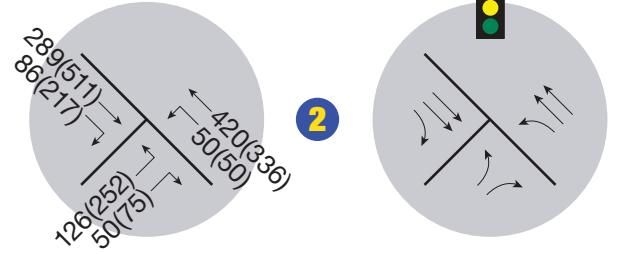
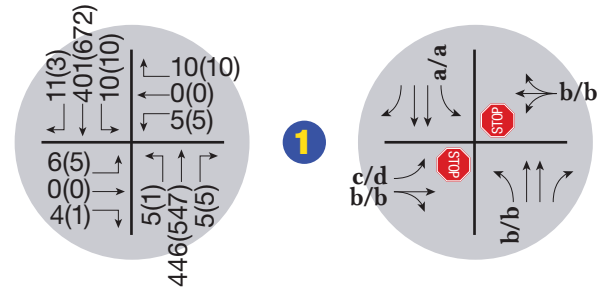
XXXX = Daily Traffic Volumes

X/X = AM/PM Peak Hour Signalized Intersection Level of Service

x/x = AM/PM Peak Hour Unsignalized Intersection Level of Service

STOP = Stop Sign

Traffic Signal



NOTE: Drawing Not to Scale



NORTH

FIGURE 7

Long-Term (2040) Total Traffic Volumes and Operations

Project Pearl 20-196 8/31/20

APPENDIX C




Trip Generation Worksheets

APPENDIX D

Intersection Analysis Worksheets

Intersection

Int Delay, s/veh 3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	88	155	56	0	0	25
Future Vol, veh/h	88	155	56	0	0	25
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	87	87	80	80	52	52
Heavy Vehicles, %	13	13	13	13	13	13
Mvmt Flow	101	178	70	0	0	48




Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	70	0	0 450 70
Stage 1	-	-	- 70 -
Stage 2	-	-	- 380 -
Critical Hdwy	4.23	-	- 6.53 6.33
Critical Hdwy Stg 1	-	-	- 5.53 -
Critical Hdwy Stg 2	-	-	- 5.53 -
Follow-up Hdwy	2.317	-	- 3.617 3.417
Pot Cap-1 Maneuver	1464	-	- 547 963
Stage 1	-	-	- 926 -
Stage 2	-	-	- 668 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1464	-	- 505 963
Mov Cap-2 Maneuver	-	-	- 505 -
Stage 1	-	-	- 855 -
Stage 2	-	-	- 668 -

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	8.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1464	-	-	-	963
HCM Lane V/C Ratio	0.069	-	-	-	0.05
HCM Control Delay (s)	7.6	0	-	-	8.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.2

Intersection






Int Delay, s/veh 2.9






Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	41	138	160	2	3	88
Future Vol, veh/h	41	138	160	2	3	88
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	91	91	91	91	89	89
Heavy Vehicles, %	9	9	9	9	9	9
Mvmt Flow	45	152	176	2	3	99






Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	178	0	0 419 177
Stage 1	-	-	- 177 -
Stage 2	-	-	- 242 -
Critical Hdwy	4.19	-	- 6.49 6.29
Critical Hdwy Stg 1	-	-	- 5.49 -
Critical Hdwy Stg 2	-	-	- 5.49 -
Follow-up Hdwy	2.281	-	- 3.581 3.381
Pot Cap-1 Maneuver	1357	-	- 578 848
Stage 1	-	-	- 837 -
Stage 2	-	-	- 782 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1357	-	- 557 848
Mov Cap-2 Maneuver	-	-	- 557 -
Stage 1	-	-	- 807 -
Stage 2	-	-	- 782 -






Approach	EB	WB	SB
HCM Control Delay, s	1.8	0	9.9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1357	-	-	-	834
HCM Lane V/C Ratio	0.033	-	-	-	0.123
HCM Control Delay (s)	7.7	0	-	-	9.9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Intersection						
Int Delay, s/veh	6.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	160	185	85	20	20	180
Future Vol, veh/h	160	185	85	20	20	180
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	80	80	52	52
Heavy Vehicles, %	13	13	13	13	13	13
Mvmt Flow	186	215	106	25	38	346
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	131	0	-	0	706	119
Stage 1	-	-	-	-	119	-
Stage 2	-	-	-	-	587	-
Critical Hdwy	4.23	-	-	-	6.53	6.33
Critical Hdwy Stg 1	-	-	-	-	5.53	-
Critical Hdwy Stg 2	-	-	-	-	5.53	-
Follow-up Hdwy	2.317	-	-	-	3.617	3.417
Pot Cap-1 Maneuver	1389	-	-	-	386	904
Stage 1	-	-	-	-	880	-
Stage 2	-	-	-	-	535	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1389	-	-	-	334	904
Mov Cap-2 Maneuver	-	-	-	-	334	-
Stage 1	-	-	-	-	762	-
Stage 2	-	-	-	-	535	-
Approach	EB	WB		SB		
HCM Control Delay, s	3.7	0		12		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1389	-	-	-	334	904
HCM Lane V/C Ratio	0.134	-	-	-	0.115	0.383
HCM Control Delay (s)	8	-	-	-	17.2	11.4
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.5	-	-	-	0.4	1.8

Intersection						
Int Delay, s/veh	5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	165	160	170	20	20	170
Future Vol, veh/h	165	160	170	20	20	170
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	89	89
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	181	176	187	22	22	191
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	209	0	-	0	736	198
Stage 1	-	-	-	-	198	-
Stage 2	-	-	-	-	538	-
Critical Hdwy	4.2	-	-	-	6.5	6.3
Critical Hdwy Stg 1	-	-	-	-	5.5	-
Critical Hdwy Stg 2	-	-	-	-	5.5	-
Follow-up Hdwy	2.29	-	-	-	3.59	3.39
Pot Cap-1 Maneuver	1316	-	-	-	375	823
Stage 1	-	-	-	-	817	-
Stage 2	-	-	-	-	570	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1316	-	-	-	323	823
Mov Cap-2 Maneuver	-	-	-	-	323	-
Stage 1	-	-	-	-	704	-
Stage 2	-	-	-	-	570	-
Approach	EB	WB		SB		
HCM Control Delay, s	4.1	0		11.4		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1316	-	-	-	323	823
HCM Lane V/C Ratio	0.138	-	-	-	0.07	0.232
HCM Control Delay (s)	8.2	-	-	-	17	10.7
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.5	-	-	-	0.2	0.9

Intersection						
Int Delay, s/veh	7.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	190	190	90	20	25	210
Future Vol, veh/h	190	190	90	20	25	210
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	86	86	80	80	52	52
Heavy Vehicles, %	13	13	13	13	13	13
Mvmt Flow	221	221	113	25	48	404
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	138	0	-	0	789	126
Stage 1	-	-	-	-	126	-
Stage 2	-	-	-	-	663	-
Critical Hdwy	4.23	-	-	-	6.53	6.33
Critical Hdwy Stg 1	-	-	-	-	5.53	-
Critical Hdwy Stg 2	-	-	-	-	5.53	-
Follow-up Hdwy	2.317	-	-	-	3.617	3.417
Pot Cap-1 Maneuver	1381	-	-	-	345	896
Stage 1	-	-	-	-	873	-
Stage 2	-	-	-	-	492	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1381	-	-	-	290	896
Mov Cap-2 Maneuver	-	-	-	-	290	-
Stage 1	-	-	-	-	733	-
Stage 2	-	-	-	-	492	-
Approach	EB	WB		SB		
HCM Control Delay, s	4.1	0		13.1		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1381	-	-	-	290	896
HCM Lane V/C Ratio	0.16	-	-	-	0.166	0.451
HCM Control Delay (s)	8.1	-	-	-	19.9	12.3
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.6	-	-	-	0.6	2.4

Intersection						
Int Delay, s/veh	5.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	230	165	175	25	25	195
Future Vol, veh/h	230	165	175	25	25	195
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	89	89
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	253	181	192	27	28	219
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	219	0	-	0	893	206
Stage 1	-	-	-	-	206	-
Stage 2	-	-	-	-	687	-
Critical Hdwy	4.2	-	-	-	6.5	6.3
Critical Hdwy Stg 1	-	-	-	-	5.5	-
Critical Hdwy Stg 2	-	-	-	-	5.5	-
Follow-up Hdwy	2.29	-	-	-	3.59	3.39
Pot Cap-1 Maneuver	1304	-	-	-	302	815
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	485	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1304	-	-	-	243	815
Mov Cap-2 Maneuver	-	-	-	-	243	-
Stage 1	-	-	-	-	653	-
Stage 2	-	-	-	-	485	-
Approach	EB	WB		SB		
HCM Control Delay, s	4.9	0		12.2		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1304	-	-	-	243	815
HCM Lane V/C Ratio	0.194	-	-	-	0.116	0.269
HCM Control Delay (s)	8.4	-	-	-	21.7	11
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0.7	-	-	-	0.4	1.1






HCM 6th TWSC
1: E 56th Avenue & Jackson Gap Street

2040 BG AM.syn
01/19/2021

Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑↑↱		↰	↱
Traffic Vol, veh/h	275	1100	1550	30	25	230
Future Vol, veh/h	275	1100	1550	30	25	230
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	86	86	72	72
Heavy Vehicles, %	13	13	13	13	13	13
Mvmt Flow	309	1236	1802	35	35	319
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1837	0	-	0	2932	919
Stage 1	-	-	-	-	1820	-
Stage 2	-	-	-	-	1112	-
Critical Hdwy	5.56	-	-	-	5.96	7.36
Critical Hdwy Stg 1	-	-	-	-	6.86	-
Critical Hdwy Stg 2	-	-	-	-	6.26	-
Follow-up Hdwy	3.23	-	-	-	3.93	4.03
Pot Cap-1 Maneuver	593	-	-	-	*~ 24	*542
Stage 1	-	-	-	-	*491	-
Stage 2	-	-	-	-	*672	-
Platoon blocked, %	1	-	-	-		1
Mov Cap-1 Maneuver	593	-	-	-	*~ 11	*542
Mov Cap-2 Maneuver	-	-	-	-	*206	-
Stage 1	-	-	-	-	*235	-
Stage 2	-	-	-	-	*672	-
Approach	EB	WB		SB		
HCM Control Delay, s	3.5	0		21.2		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	593	-	-	-	206	542
HCM Lane V/C Ratio	0.521	-	-	-	0.169	0.589
HCM Control Delay (s)	17.5	-	-	-	26	20.7
HCM Lane LOS	C	-	-	-	D	C
HCM 95th %tile Q(veh)	3	-	-	-	0.6	3.8
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

HCM 6th TWSC
1: E 56th Avenue & Jackson Gap Street

2040 BG PM.syn
01/19/2021

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	255	1490	1570	30	35	310
Future Vol, veh/h	255	1490	1570	30	35	310
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	2	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	277	1620	1707	33	38	337
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1740	0	-	0	2926	870
Stage 1	-	-	-	-	1724	-
Stage 2	-	-	-	-	1202	-
Critical Hdwy	5.5	-	-	-	5.9	7.3
Critical Hdwy Stg 1	-	-	-	-	6.8	-
Critical Hdwy Stg 2	-	-	-	-	6.2	-
Follow-up Hdwy	3.2	-	-	-	3.9	4
Pot Cap-1 Maneuver	*684	-	-	-	*~ 25	*547
Stage 1	-	-	-	-	*561	-
Stage 2	-	-	-	-	*588	-
Platoon blocked, %	1	-	-	-		1
Mov Cap-1 Maneuver	*684	-	-	-	*~ 15	*547
Mov Cap-2 Maneuver	-	-	-	-	*267	-
Stage 1	-	-	-	-	*334	-
Stage 2	-	-	-	-	*588	-
Approach	EB	WB		SB		
HCM Control Delay, s	2	0		21.5		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	* 684	-	-	-	267	547
HCM Lane V/C Ratio	0.405	-	-	-	0.142	0.616
HCM Control Delay (s)	13.8	-	-	-	20.7	21.6
HCM Lane LOS	B	-	-	-	C	C
HCM 95th %tile Q(veh)	2	-	-	-	0.5	4.2
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

HCM 6th TWSC
1: E 56th Avenue & Jackson Gap Street

2040 Total AM.syn
01/19/2021







Intersection						
Int Delay, s/veh	4.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑↑↱		↰	↱
Traffic Vol, veh/h	305	1105	1555	30	30	260
Future Vol, veh/h	305	1105	1555	30	30	260
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	86	86	72	72
Heavy Vehicles, %	13	13	13	13	13	13
Mvmt Flow	343	1242	1808	35	42	361
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1843	0	-	0	3009	922
Stage 1	-	-	-	-	1826	-
Stage 2	-	-	-	-	1183	-
Critical Hdwy	5.56	-	-	-	5.96	7.36
Critical Hdwy Stg 1	-	-	-	-	6.86	-
Critical Hdwy Stg 2	-	-	-	-	6.26	-
Follow-up Hdwy	3.23	-	-	-	3.93	4.03
Pot Cap-1 Maneuver	596	-	-	-	*274	*540
Stage 1	-	-	-	-	*493	-
Stage 2	-	-	-	-	*672	-
Platoon blocked, %	1	-	-	-	1	1
Mov Cap-1 Maneuver	596	-	-	-	*116	*540
Mov Cap-2 Maneuver	-	-	-	-	*179	-
Stage 1	-	-	-	-	*209	-
Stage 2	-	-	-	-	*672	-
Approach	EB		WB		SB	
HCM Control Delay, s	4.1		0		24.8	
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	596	-	-	-	179	540
HCM Lane V/C Ratio	0.575	-	-	-	0.233	0.669
HCM Control Delay (s)	18.9	-	-	-	31.1	24.1
HCM Lane LOS	C	-	-	-	D	C
HCM 95th %tile Q(veh)	3.6	-	-	-	0.9	5
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

HCM 6th TWSC
1: E 56th Avenue & Jackson Gap Street

2040 Total PM.syn
01/19/2021

Intersection

Int Delay, s/veh 3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	320	1495	1575	35	40	335
Future Vol, veh/h	320	1495	1575	35	40	335
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10
Mvmt Flow	348	1625	1712	38	43	364





Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	1750	0	0 3077 875
Stage 1	-	-	- 1731 -
Stage 2	-	-	- 1346 -
Critical Hdwy	5.5	-	- 5.9 7.3
Critical Hdwy Stg 1	-	-	- 6.8 -
Critical Hdwy Stg 2	-	-	- 6.2 -
Follow-up Hdwy	3.2	-	- 3.9 4
Pot Cap-1 Maneuver	*681	-	- *225 *545
Stage 1	-	-	- *559 -
Stage 2	-	-	- *588 -
Platoon blocked, %	1	-	- 1 1
Mov Cap-1 Maneuver	*681	-	- *110 *545
Mov Cap-2 Maneuver	-	-	- *211 -
Stage 1	-	-	- *273 -
Stage 2	-	-	- *588 -

Approach	EB	WB	SB
HCM Control Delay, s	2.8	0	24.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	* 681	-	-	-	211	545
HCM Lane V/C Ratio	0.511	-	-	-	0.206	0.668
HCM Control Delay (s)	15.7	-	-	-	26.4	23.9
HCM Lane LOS	C	-	-	-	D	C
HCM 95th %tile Q(veh)	2.9	-	-	-	0.8	5

Notes





~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	365	325	10	10	20
Future Vol, veh/h	20	365	325	10	10	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	100	13	13	100	100	100
Mvmt Flow	22	397	353	11	11	22

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	364	0	800
Stage 1	-	-	359
Stage 2	-	-	441
Critical Hdwy	5.1	-	7.4
Critical Hdwy Stg 1	-	-	6.4
Critical Hdwy Stg 2	-	-	6.4
Follow-up Hdwy	3.1	-	4.4
Pot Cap-1 Maneuver	808	-	248
Stage 1	-	-	534
Stage 2	-	-	483
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	808	-	241
Mov Cap-2 Maneuver	-	-	241
Stage 1	-	-	520
Stage 2	-	-	483





Approach	EB	WB	SB
HCM Control Delay, s	0.5	0	15.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	808	-	-	-	372
HCM Lane V/C Ratio	0.027	-	-	-	0.088
HCM Control Delay (s)	9.6	-	-	-	15.6
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	380	405	10	10	25
Future Vol, veh/h	15	380	405	10	10	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	100	10	10	100	100	100
Mvmt Flow	16	413	440	11	11	27
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	451	0	-	0	891	446
Stage 1	-	-	-	-	446	-
Stage 2	-	-	-	-	445	-
Critical Hdwy	5.1	-	-	-	7.4	7.2
Critical Hdwy Stg 1	-	-	-	-	6.4	-
Critical Hdwy Stg 2	-	-	-	-	6.4	-
Follow-up Hdwy	3.1	-	-	-	4.4	4.2
Pot Cap-1 Maneuver	740	-	-	-	215	451
Stage 1	-	-	-	-	480	-
Stage 2	-	-	-	-	481	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	740	-	-	-	210	451
Mov Cap-2 Maneuver	-	-	-	-	210	-
Stage 1	-	-	-	-	469	-
Stage 2	-	-	-	-	481	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.4	0		16.9		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	740	-	-	-	340	
HCM Lane V/C Ratio	0.022	-	-	-	0.112	
HCM Control Delay (s)	10	-	-	-	16.9	
HCM Lane LOS	A	-	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4	

HCM 6th TWSC
3: E 56th Avenue & Truck Access

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Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	1395	1840	10	10	20
Future Vol, veh/h	20	1395	1840	10	10	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	100	13	13	100	100	100
Mvmt Flow	22	1516	2000	11	11	22

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	2011	0	0 2656 1006
Stage 1	-	-	- 2006 -
Stage 2	-	-	- 650 -
Critical Hdwy	7.3	-	- 7.7 9.1
Critical Hdwy Stg 1	-	-	- 8.6 -
Critical Hdwy Stg 2	-	-	- 8 -
Follow-up Hdwy	4.1	-	- 4.8 4.9
Pot Cap-1 Maneuver	*475	-	- *239 *397
Stage 1	-	-	- *406 -
Stage 2	-	-	- *478 -
Platoon blocked, %	1	-	- 1 1
Mov Cap-1 Maneuver	*475	-	- *228 *397
Mov Cap-2 Maneuver	-	-	- *297 -
Stage 1	-	-	- *387 -
Stage 2	-	-	- *478 -





Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	16.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	* 475	-	-	-	357
HCM Lane V/C Ratio	0.046	-	-	-	0.091
HCM Control Delay (s)	12.9	-	-	-	16.1
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.3

Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th TWSC
3: E 56th Avenue & Truck Access

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Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	1800	1945	10	10	25
Future Vol, veh/h	15	1800	1945	10	10	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	150	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	100	10	10	100	100	100
Mvmt Flow	16	1957	2114	11	11	27

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	2125	0	0 2935 1063
Stage 1	-	-	- 2120 -
Stage 2	-	-	- 815 -
Critical Hdwy	7.3	-	- 7.7 9.1
Critical Hdwy Stg 1	-	-	- 8.6 -
Critical Hdwy Stg 2	-	-	- 8 -
Follow-up Hdwy	4.1	-	- 4.8 4.9
Pot Cap-1 Maneuver	*447	-	- *167 *374
Stage 1	-	-	- *382 -
Stage 2	-	-	- *406 -
Platoon blocked, %	1	-	- 1 1
Mov Cap-1 Maneuver	*447	-	- *161 *374
Mov Cap-2 Maneuver	-	-	- *249 -
Stage 1	-	-	- *368 -
Stage 2	-	-	- *406 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	17.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	* 447	-	-	-	327
HCM Lane V/C Ratio	0.036	-	-	-	0.116
HCM Control Delay (s)	13.4	-	-	-	17.5
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Notes			
-: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th TWSC
4: E 56th Avenue & Employee RIRO Access

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Intersection

Int Delay, s/veh 0.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	375	300	1	0	35
Future Vol, veh/h	0	375	300	1	0	35
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, %	2	13	13	2	2	2
Mvmt Flow	0	408	326	1	0	38

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 327
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.22
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.318
Pot Cap-1 Maneuver	0	-	- 0 714
Stage 1	0	-	- 0 -
Stage 2	0	-	- 0 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- - 714
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

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

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	714
HCM Lane V/C Ratio	-	-	-	0.053
HCM Control Delay (s)	-	-	-	10.3
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.2

HCM 6th TWSC
4: E 56th Avenue & Employee RIRO Access

2023 Total PM.syn
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Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	390	360	3	0	50
Future Vol, veh/h	0	390	360	3	0	50
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, %	2	10	10	2	2	2
Mvmt Flow	0	424	391	3	0	54

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 393
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.22
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.318
Pot Cap-1 Maneuver	0	-	- 0 656
Stage 1	0	-	- 0 -
Stage 2	0	-	- 0 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- - 656
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	656
HCM Lane V/C Ratio	-	-	-	0.083
HCM Control Delay (s)	-	-	-	11
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.3

HCM 6th TWSC
4: E 56th Avenue & Employee RIRO Access

2040 Total AM.syn
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Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑↑	↑↑↑↓			↗
Traffic Vol, veh/h	0	1405	1815	1	0	35
Future Vol, veh/h	0	1405	1815	1	0	35
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, %	2	13	13	2	2	2
Mvmt Flow	0	1527	1973	1	0	38
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	987
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	-	0	*497
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		1
Mov Cap-1 Maneuver	-	-	-	-	-	*497
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		12.8		
HCM LOS	B					
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	497		
HCM Lane V/C Ratio	-	-	-	0.077		
HCM Control Delay (s)	-	-	-	12.8		
HCM Lane LOS	-	-	-	B		
HCM 95th %tile Q(veh)	-	-	-	0.2		
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon






HCM 6th TWSC
4: E 56th Avenue & Employee RIRO Access

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Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑↑	↑↑↑↓			↗
Traffic Vol, veh/h	0	1810	1900	3	0	50
Future Vol, veh/h	0	1810	1900	3	0	50
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, %	2	10	10	2	2	2
Mvmt Flow	0	1967	2065	3	0	54
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	1034
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.92
Pot Cap-1 Maneuver	0	-	-	-	0	*467
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		1
Mov Cap-1 Maneuver	-	-	-	-	-	*467
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB		WB		SB	
HCM Control Delay, s	0		0		13.7	
HCM LOS	B					
Minor Lane/Major Mvmt	EBT		WBT	WBR	SBLn1	
Capacity (veh/h)	-		-	-	467	
HCM Lane V/C Ratio	-		-	-	0.116	
HCM Control Delay (s)	-		-	-	13.7	
HCM Lane LOS	-		-	-	B	
HCM 95th %tile Q(veh)	-		-	-	0.4	
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						






HCM 6th TWSC
5: Jackson Gap Street & Employee Full Access

2023 Total AM.syn
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Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	15	20	190	220	10
Future Vol, veh/h	20	15	20	190	220	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	13	13	2
Mvmt Flow	22	16	22	207	239	11
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	496	245	250	0	-	0
Stage 1	245	-	-	-	-	-
Stage 2	251	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	533	794	1316	-	-	-
Stage 1	796	-	-	-	-	-
Stage 2	791	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	524	794	1316	-	-	-
Mov Cap-2 Maneuver	598	-	-	-	-	-
Stage 1	782	-	-	-	-	-
Stage 2	791	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.7	0.7		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1316	-	669	-	-	
HCM Lane V/C Ratio	0.017	-	0.057	-	-	
HCM Control Delay (s)	7.8	-	10.7	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-	

HCM 6th TWSC
5: Jackson Gap Street & Employee Full Access

2023 Total PM.syn
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Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	20	45	205	195	20
Future Vol, veh/h	30	20	45	205	195	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	10	10	2
Mvmt Flow	33	22	49	223	212	22






Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	544	223	234	0	-	0
Stage 1	223	-	-	-	-	-
Stage 2	321	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	500	817	1333	-	-	-
Stage 1	814	-	-	-	-	-
Stage 2	735	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	482	817	1333	-	-	-
Mov Cap-2 Maneuver	566	-	-	-	-	-
Stage 1	784	-	-	-	-	-
Stage 2	735	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.1	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1333	-	645	-	-
HCM Lane V/C Ratio	0.037	-	0.084	-	-
HCM Control Delay (s)	7.8	-	11.1	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-






HCM 6th TWSC
5: Jackson Gap Street & Employee Full Access

2040 Total AM.syn
01/19/2021

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	20	15	20	315	275	10
Future Vol, veh/h	20	15	20	315	275	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	13	13	2
Mvmt Flow	22	16	22	342	299	11
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	691	305	310	0	-	0
Stage 1	305	-	-	-	-	-
Stage 2	386	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	410	735	1250	-	-	-
Stage 1	748	-	-	-	-	-
Stage 2	687	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	403	735	1250	-	-	-
Mov Cap-2 Maneuver	508	-	-	-	-	-
Stage 1	735	-	-	-	-	-
Stage 2	687	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.6	0.5		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1250	-	585	-	-	
HCM Lane V/C Ratio	0.017	-	0.065	-	-	
HCM Control Delay (s)	7.9	-	11.6	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-	




HCM 6th TWSC
5: Jackson Gap Street & Employee Full Access

2040 Total PM.syn
01/19/2021

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	30	20	45	305	350	20
Future Vol, veh/h	30	20	45	305	350	20
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	10	10	2
Mvmt Flow	33	22	49	332	380	22
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	821	391	402	0	-	0
Stage 1	391	-	-	-	-	-
Stage 2	430	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	344	658	1157	-	-	-
Stage 1	683	-	-	-	-	-
Stage 2	656	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	330	658	1157	-	-	-
Mov Cap-2 Maneuver	450	-	-	-	-	-
Stage 1	654	-	-	-	-	-
Stage 2	656	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.8	1.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1157	-	515	-	-	
HCM Lane V/C Ratio	0.042	-	0.106	-	-	
HCM Control Delay (s)	8.2	-	12.8	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0.1	-	0.4	-	-	

HCM 6th TWSC
6: Jackson Gap Street & Van Access

2023 Total AM.syn
01/19/2021

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	15	1	210	215	1
Future Vol, veh/h	10	15	1	210	215	1
Conflicting Peds, #/hr	0	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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	13	13	2
Mvmt Flow	11	16	1	228	234	1




Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	465	235	235	0	-	0
Stage 1	235	-	-	-	-	-
Stage 2	230	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	556	804	1332	-	-	-
Stage 1	804	-	-	-	-	-
Stage 2	808	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	555	804	1332	-	-	-
Mov Cap-2 Maneuver	555	-	-	-	-	-
Stage 1	803	-	-	-	-	-
Stage 2	808	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1332	-	682	-	-
HCM Lane V/C Ratio	0.001	-	0.04	-	-
HCM Control Delay (s)	7.7	0	10.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-




HCM 6th TWSC
6: Jackson Gap Street & Van Access

2023 Total PM.syn
01/19/2021

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	15	225	215	5
Future Vol, veh/h	1	1	15	225	215	5
Conflicting Peds, #/hr	0	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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	10	10	2
Mvmt Flow	1	1	16	245	234	5
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	514	237	239	0	-	0
Stage 1	237	-	-	-	-	-
Stage 2	277	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	521	802	1328	-	-	-
Stage 1	802	-	-	-	-	-
Stage 2	770	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	514	802	1328	-	-	-
Mov Cap-2 Maneuver	514	-	-	-	-	-
Stage 1	791	-	-	-	-	-
Stage 2	770	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.8	0.5		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1328	-	626	-	-	
HCM Lane V/C Ratio	0.012	-	0.003	-	-	
HCM Control Delay (s)	7.7	0	10.8	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
6: Jackson Gap Street & Van Access

2040 Total AM.syn
01/19/2021

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	10	15	1	335	270	1
Future Vol, veh/h	10	15	1	335	270	1
Conflicting Peds, #/hr	0	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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	13	13	2
Mvmt Flow	11	16	1	364	293	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	660	294	294	0	-	0
Stage 1	294	-	-	-	-	-
Stage 2	366	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	428	745	1268	-	-	-
Stage 1	756	-	-	-	-	-
Stage 2	702	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	428	745	1268	-	-	-
Mov Cap-2 Maneuver	428	-	-	-	-	-
Stage 1	755	-	-	-	-	-
Stage 2	702	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.6	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1268	-	575	-	-	
HCM Lane V/C Ratio	0.001	-	0.047	-	-	
HCM Control Delay (s)	7.8	0	11.6	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	




HCM 6th TWSC
6: Jackson Gap Street & Van Access

2040 Total PM.syn
01/19/2021

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	15	325	370	5
Future Vol, veh/h	1	1	15	325	370	5
Conflicting Peds, #/hr	0	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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	10	10	2
Mvmt Flow	1	1	16	353	402	5
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	790	405	407	0	-	0
Stage 1	405	-	-	-	-	-
Stage 2	385	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	359	646	1152	-	-	-
Stage 1	673	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	353	646	1152	-	-	-
Mov Cap-2 Maneuver	353	-	-	-	-	-
Stage 1	662	-	-	-	-	-
Stage 2	688	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.9	0.4		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1152	-	457	-	-	
HCM Lane V/C Ratio	0.014	-	0.005	-	-	
HCM Control Delay (s)	8.2	0	12.9	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
7: Jackson Gap Street & Secondary Truck Access

2023 Total AM.syn
01/19/2021

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	0	1	215	215	3
Future Vol, veh/h	3	0	1	215	215	3
Conflicting Peds, #/hr	0	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	92	92	92	92	92	92
Heavy Vehicles, %	100	100	100	13	13	100
Mvmt Flow	3	0	1	234	234	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	472	236	237	0	-	0
Stage 1	236	-	-	-	-	-
Stage 2	236	-	-	-	-	-
Critical Hdwy	7.4	7.2	5.1	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	4.2	3.1	-	-	-
Pot Cap-1 Maneuver	408	612	918	-	-	-
Stage 1	619	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	408	612	918	-	-	-
Mov Cap-2 Maneuver	408	-	-	-	-	-
Stage 1	618	-	-	-	-	-
Stage 2	619	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.9	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	918	-	408	-	-	
HCM Lane V/C Ratio	0.001	-	0.008	-	-	
HCM Control Delay (s)	8.9	0	13.9	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
7: Jackson Gap Street & Secondary Truck Access

2023 Total PM.syn
01/19/2021

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	0	1	225	220	2
Future Vol, veh/h	4	0	1	225	220	2
Conflicting Peds, #/hr	0	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	92	92	92	92	92	92
Heavy Vehicles, %	100	100	100	10	10	100
Mvmt Flow	4	0	1	245	239	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	487	240	241	0	-	0
Stage 1	240	-	-	-	-	-
Stage 2	247	-	-	-	-	-
Critical Hdwy	7.4	7.2	5.1	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	4.2	3.1	-	-	-
Pot Cap-1 Maneuver	399	608	914	-	-	-
Stage 1	616	-	-	-	-	-
Stage 2	611	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	399	608	914	-	-	-
Mov Cap-2 Maneuver	399	-	-	-	-	-
Stage 1	615	-	-	-	-	-
Stage 2	611	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.1	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	914	-	399	-	-	
HCM Lane V/C Ratio	0.001	-	0.011	-	-	
HCM Control Delay (s)	8.9	0	14.1	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
7: Jackson Gap Street & Secondary Truck Access

2040 Total AM.syn
01/19/2021

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	0	1	340	270	3
Future Vol, veh/h	3	0	1	340	270	3
Conflicting Peds, #/hr	0	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	92	92	92	92	92	92
Heavy Vehicles, %	100	100	100	13	13	100
Mvmt Flow	3	0	1	370	293	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	667	295	296	0	-	0
Stage 1	295	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Critical Hdwy	7.4	7.2	5.1	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	4.2	3.1	-	-	-
Pot Cap-1 Maneuver	304	562	865	-	-	-
Stage 1	577	-	-	-	-	-
Stage 2	526	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	304	562	865	-	-	-
Mov Cap-2 Maneuver	304	-	-	-	-	-
Stage 1	576	-	-	-	-	-
Stage 2	526	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	17	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	865	-	304	-	-	
HCM Lane V/C Ratio	0.001	-	0.011	-	-	
HCM Control Delay (s)	9.2	0	17	-	-	
HCM Lane LOS	A	A	C	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 6th TWSC
7: Jackson Gap Street & Secondary Truck Access

2040 Total PM.syn
01/19/2021

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	0	1	325	375	2
Future Vol, veh/h	4	0	1	325	375	2
Conflicting Peds, #/hr	0	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	92	92	92	92	92	92
Heavy Vehicles, %	100	100	100	10	10	100
Mvmt Flow	4	0	1	353	408	2

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	764	409	410	0	-	0
Stage 1	409	-	-	-	-	-
Stage 2	355	-	-	-	-	-
Critical Hdwy	7.4	7.2	5.1	-	-	-
Critical Hdwy Stg 1	6.4	-	-	-	-	-
Critical Hdwy Stg 2	6.4	-	-	-	-	-
Follow-up Hdwy	4.4	4.2	3.1	-	-	-
Pot Cap-1 Maneuver	262	476	771	-	-	-
Stage 1	502	-	-	-	-	-
Stage 2	537	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	261	476	771	-	-	-
Mov Cap-2 Maneuver	261	-	-	-	-	-
Stage 1	501	-	-	-	-	-
Stage 2	537	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	19	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	771	-	261	-	-
HCM Lane V/C Ratio	0.001	-	0.017	-	-
HCM Control Delay (s)	9.7	0	19	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

APPENDIX E

Queuing Analysis Worksheets

QUEUE STORAGE WORKSHEET

Gated Entrance

ITE Transportation and Land Development, Chapter 8 - Drive-In Facilities

Location Distribution Facility (Primary Truck Access)

Condition Peak Hour of Generator

Storage = $((\ln P(x>M) - \ln Q_m) / \ln p) - 1 \times \text{Average Length of Vehicle}$

M = queue length which is exceeded p percent of the time

N = number of service channels (drive in positions)

Q = service rate per channel (vehicles per hour)

p = demand rate/service rate = q/NQ = utilization factor

q = demand rate on the system (vehicles per hour)

Q_m = tabled values of the relationship between queue length, number of channels and utilization factor (if n = 1, Q_m = p)

Where:

Q = 30 vehicles/hour assuming a 120 second wait

P(x > M) = 5 percent = .05

67 ft/veh = Average Length of Vehicle

q = 41 vehicles per hour

N = Number of Lanes= 2

p = q/NQ = 0.68 Q_m = 0.55

M = Storage = $\{[(\ln .05 - \ln 0.55) / \ln 0.68] - 1\} \times 67$

M = Storage = $\{[(\underline{-2.996} - \underline{-0.59784}) / \underline{-0.381}] - 1\} \times 67$

M = Storage = 355 ft

Where:

SL = Desirable Storage Per Lane= 355 Ft

Available Storage = 550 Ft = Adequate Storage

QUEUE STORAGE WORKSHEET

Gated Entrance

ITE Transportation and Land Development, Chapter 8 - Drive-In Facilities

Location Distribution Facility (Secondary Truck Access)

Condition Peak Hour of Generator

Storage = $((\ln P(x > M) - \ln Q_m) / \ln p) - 1 \times \text{Average Length of Vehicle}$

M = queue length which is exceeded p percent of the time

N = number of service channels (drive in positions)

Q = service rate per channel (vehicles per hour)

p = demand rate/service rate = q/NQ = utilization factor

q = demand rate on the system (vehicles per hour)

Q_m = tabled values of the relationship between queue length, number of channels and utilization factor (if $n = 1$, $Q_m = p$)

Where:

Q = 30 vehicles/hour assuming a 120 second wait

$P(x > M) = 5$ percent = .05

67 ft/veh = Average Length of Vehicle

q = 10 vehicles per hour

N = Number of Lanes= 1

$$p = q/NQ = \underline{0.33} \quad Q_m = \underline{0.33}$$

$$M = \text{Storage} = \{[(\ln .05 - \ln 0.33) / \ln 0.33] - 1\} \times 67$$

$$M = \text{Storage} = \{[(\underline{-2.996} - \underline{-1.10866}) / \underline{-1.099}] - 1\} \times 67$$

$$M = \text{Storage} = \underline{48} \text{ ft}$$

Where:

SL = Desirable Storage Per Lane= 48 Ft

Available Storage = 100 Ft = Adequate Storage

QUEUE STORAGE WORKSHEET

Gated Entrance

ITE Transportation and Land Development, Chapter 8 - Drive-In Facilities

Location Distribution Facility (Van Access)

Condition Peak Hour of Generator

Storage = $((\ln P(x > M) - \ln Q_m) / \ln p) - 1 \times \text{Average Length of Vehicle}$

M = queue length which is exceeded p percent of the time

N = number of service channels (drive in positions)

Q = service rate per channel (vehicles per hour)

p = demand rate/service rate = q/NQ = utilization factor

q = demand rate on the system (vehicles per hour)

Q_m = tabled values of the relationship between queue length, number of channels and utilization factor (if $n = 1$, $Q_m = p$)

Where:

Q = 120 vehicles/hour assuming a 30 second wait

$P(x > M) = 5 \text{ percent} = .05$

30 ft/veh = Average Length of Vehicle

q = 15 vehicles per hour

N = Number of Lanes= 1

$$p = q/NQ = \underline{0.13} \quad Q_m = \underline{0.13}$$

$$M = \text{Storage} = \{[(\ln .05 - \ln 0.13) / \ln 0.13] - 1\} \times 30$$

$$M = \text{Storage} = \{[(\underline{-2.996} - \underline{-2.04022}) / \underline{-2.079}] - 1\} \times 30$$

$$M = \text{Storage} = \underline{14} \text{ ft}$$

Where:

$$SL = \text{Desirable Storage Per Lane} = \underline{14} \text{ Ft}$$

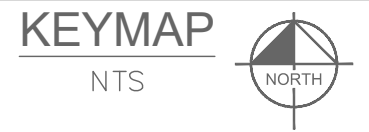
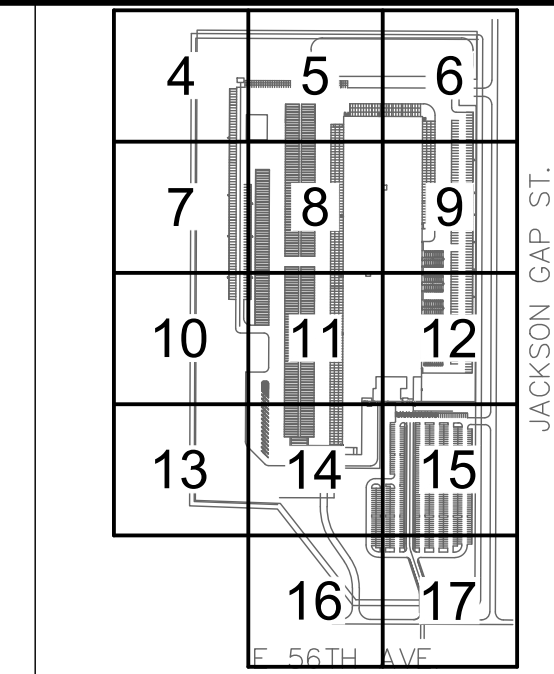
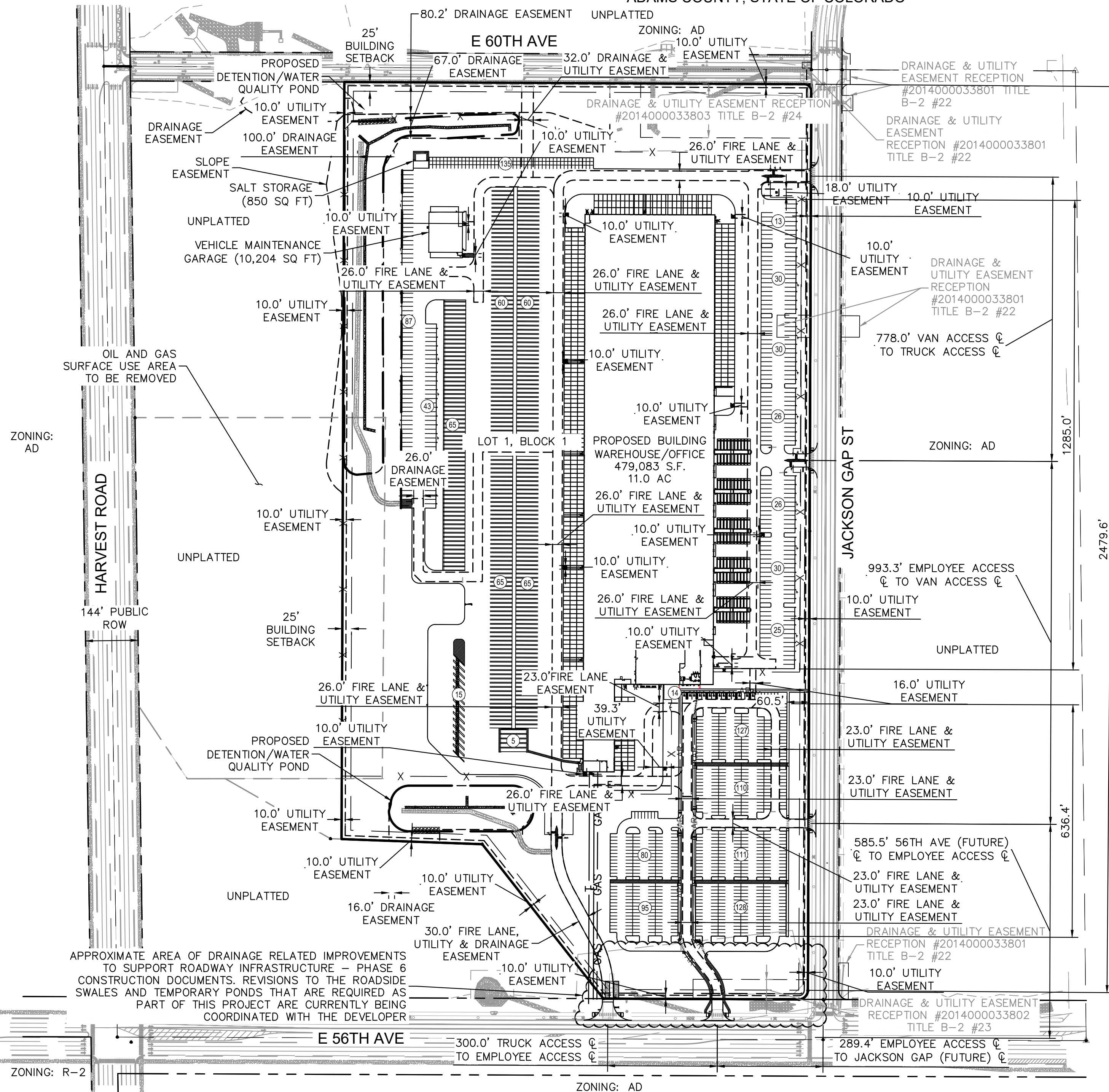
$$\text{Available Storage} = \underline{60} \text{ Ft} = \text{Adequate Storage}$$

APPENDIX F

Conceptual Site Plan

PROJECT TIGER AT PORTEOS
SITE PLAN

LOCATED IN THE SW 1/4 OF SECTION 8, TOWNSHIP 3 SOUTH,
RANGE 65 WEST OF THE 6TH P.M.,
ADAMS COUNTY, STATE OF COLORADO



LEGEND

- PROPERTY LINE
- EASEMENT LINE
- PROPOSED FENCE
- PARKING COUNT
- PARKING ALONG ARTERIAL STREET (60% MAX WITHIN 60' OF PROPERTY LINE)
- TOTAL LOT FRONTAGE (JACKSON GAP ST) - 2479.6 LF
- PARKING WITHIN 60 LF OF PROPERTY LINE - 1285 LF
- PARKING BEYOND 60 LF FROM PROPERTY LINE - 636.4 LF

NOTES:

- DIMENSIONS ARE TO FACE OF CURB UNLESS OTHERWISE NOTED.
 - SIGNS TO COMPLY WITH MUTCD LATEST EDITION, UNLESS NOTED.
 - SIDEWALKS AND RAMPS SHALL BE CONSTRUCTED IN COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT. HANDICAP ACCESSIBLE ROUTES SHALL SLOPE NO MORE THAN 1:20 IN DIRECTION OF TRAVEL AND NO MORE THAN 1:50 CROSS SLOPE.
 - ADJACENT PUBLIC IMPROVEMENTS SHALL BE COMPLETED AND ACCEPTED PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY.
 - PARKING ALONG ARTERIAL STREET (60% MAX WITHIN 60' OF PROPERTY LINE):
- TOTAL LOT FRONTAGE (JACKSON GAP ST) - 2479.6 LF
PARKING WITHIN 60 LF OF PROPERTY LINE - 1285 LF (51.8%)
PARKING BEYOND 60 LF FROM PROPERTY LINE - 636.4 LF (25.7%)

Kimley»Horn
KIMLEY-HORN AND ASSOCIATES, INC.
4835 South Ute Avenue, Suite 100
Denver, Colorado 80237 (303) 228-2300

PROJECT TIGER AT PORTEOS
CITY OF AURORA, COUNTY OF ADAMS
SITE PLAN
OVERALL SITE PLAN

DATE: 2/16/2021
DESIGNED BY: BJC
DRAWN BY: CM
CHECKED BY: ELG

FILE NO.
SP_OV
PROJECT NO.
096360012

SHEET NO.