



June 12, 2024

Mr. Clay Smith, P.E.
AMS 2024 BTS – Aurora CO, LLC
8888 Keystone Crossing
Suite 1150
Indianapolis, IN 46240

Re: DIA Buildings I & II – Porteos
Traffic Study Letter
Aurora, Colorado

Dear Mr. Smith:

This traffic study letter documents a trip generation comparison to identify conformance with the original traffic impact study for the two (2) proposed industrial buildings located on the southeast corner of the 64th Avenue and Powhaton Road intersection in Aurora, Colorado. Additionally, an intersection analysis for the 64th Avenue and Powhaton Road intersection, a turn lane analysis, and a signal warrant analysis is included in this letter for a short-term buildout year of 2025 as well as the long-term 2040 horizon. Building I is proposed to provide a building area of 624,101 square feet and Building II is proposed to provide 1,024,501 square feet, totaling 1,657,770 square feet. A conceptual site plan is attached, and the site area is illustrated in **Figure 1** attached.

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, 64th Avenue, Jackson Gap Street, and Powhaton Road. Direct access to the project is proposed from two full movement accesses along the south side of 64th Avenue and two full movement accesses along the east side of Powhaton Road. Additionally, an inbound only access is proposed to serve both buildings along Powhaton Road.

PROJECT ACCESS

This development was studied within the *Porteos Industrial Traffic Impact Study* prepared by Kimley-Horn in August 2021. The original traffic study included two industrial buildings totaling 1,653,000 square feet. Two full movement accesses along the south side of 64th Avenue were proposed and are currently constructed since Building I is already built. However, accesses along Powhaton Road have not yet been constructed.

The current proposal includes closing the recently constructed east access along 64th Avenue and constructing an access approximately 380 feet east of the existing access. The west driveway along 64th Avenue and the proposed north access along Powhaton Road will serve as employee access for Building I. The east driveway will serve as a truck outbound only access for Building I and allow for two-way traffic to access Building II. A driveway south of the northern driveway along Powhaton Road is proposed to serve as a shared inbound only entrance for Building I and II traffic. Lastly, a full movement access is proposed on the south end of the site to serve only Building II traffic along Powhaton Road.

TRIP GENERATION

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Manual*¹ published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses.

From the original traffic study, the trip generation was based on ITE Trip Generation, 10th Edition (most recent at the time of the study) rates for the Industrial Park (ITE Code 130) land use. For the current proposal, the trip generation is based on the most recent ITE Trip Generation, 11th Edition rates for Industrial Park (ITE Code 130) land use for Building II. However, site-specific trip generation data is provided for Building I by the client. The following **Table 1** summarizes the anticipated trip generation for DIA Building I & II compared to the trip generation for the previously studied Porteos Industrial development (trip generation calculations and original study trip generation table are attached).

Table 1 –Trip Generation Comparison

Use and Size	Daily Vehicle Trips	Weekday Vehicle Trips					
		AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Original Traffic Study							
Industrial Park (ITE 10 th Edition 130) 1,653,000 SF (Both Buildings)	5,572	535	126	661	139	523	662
Current Proposal							
Client Specific 624,101 SF (Building I)	3,600	113	36	149	84	466	550
Industrial Park (ITE 11 th Edition 130) 1,024,501 SF (Building II)	3,484	282	66	348	77	271	348
Total Project Trips	7,084	395	102	497	161	737	898
Net Difference in Trips	+1,512	-140	-24	-164	+22	+214	+236

As summarized in **Table 1**, the current proposal for the site is proposed to provide two industrial buildings total 1,658,602 square feet that are anticipated to generate 7,084 daily trips with 497 trips occurring during the morning and 898 trips occurring during the afternoon. The current proposal generates 1,512 more daily trips with 164 fewer trips in the morning peak hour, and 236 more trips in the afternoon peak hour when compared to the original traffic study. Even though the new proposal generates more trips than the original traffic study, the following sections will demonstrate the increase in trips does not change the original TIS intersection recommendations.

¹ Institute of Transportation Engineers, *Trip Generation: An Information Report*, Eleventh Edition, Washington DC, 2021.

TRIP DISTRIBUTION AND TRAFFIC ASSIGNMENT

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, 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. The traffic assignment was obtained by applying the project trip distribution to the estimated traffic generation of the development shown in **Table 1**. **Figure 3** and **Figure 4** illustrates the trip distribution for the Building I employees and Building I truck traffic, respectively. **Figure 5** illustrates the traffic assignment for Building I. Likewise, **Figure 6** illustrates the trip distribution for Building II and **Figure 7** illustrates the traffic assignment for Building II. Of note, the trip distribution may evolve once the surrounding roadway network is constructed.

INTERSECTION ANALYSIS

EXISTING ROADWAY NETWORK

The existing intersection of 64th Avenue and Powhaton Road operates under stop control on all four approaches. The eastbound 64th Avenue approach and the northbound Powhaton Road approach provides a separate left turn lane, a through lane, and a right turn lane. The westbound and southbound approaches provide a left turn lane, a through lane, and a share through/right turn lane. The existing intersection geometry and control has evolved since the original Porteos Industrial Traffic Study was completed for existing conditions. An aerial of the intersection geometry is shown below.



EXISTING AND FUTURE TRAFFIC VOLUMES

Existing turning movement counts were conducted at the study intersection on Wednesday, February 21, 2024 during the morning and afternoon peak hours. The counts were conducted during the morning and afternoon peak hours of adjacent street traffic in 15-minute intervals from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on this count date. The existing intersection traffic volumes and geometry and control are also shown in attached **Figure 2** with count sheets attached.

To generate 2025 traffic volumes, a two (2) percent annual growth rate used which is consistent with City of Aurora growth rates. Additionally, the Porteos PA 5 – JAG Logistics Center at DIA and Porteos PA 3 – Jackson Gap Commercial in Aurora developments were included in the background traffic volumes.

The long-term 2040 traffic volumes were developed from adding the project traffic trips directly to the projected 2040 background traffic volumes provided in the original TIS at the 64th Avenue and Powhaton Road intersection. The background 2040 traffic volumes are attached for reference.

The external trip distribution remains the same as the original traffic study; however, the internal trip distribution percentages at the accesses have been refined to align with the current access plan. The traffic assignment was obtained by applying the project trip distribution to the estimated traffic generation of the development shown in **Table 1**. **Figure 8** illustrates the total traffic volumes for the 2025 horizon and **Figure 9** illustrates the total traffic volumes for the long-term 2040 horizon.

TRAFFIC OPERATION ANALYSIS METHODOLOGY

Kimley-Horn's analysis of traffic operations in the site vicinity was conducted to determine potential capacity deficiencies at the project key intersections for the 2025 opening horizon and the requested long-term 2040 horizon. 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 worse than LOS D, potential alternatives to improve the intersection to achieve LOS D should be provided 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. Calculations for the level of service at the key intersections identified for the study are attached.

Synchro traffic analysis software was used to analyze the 64th Avenue and Powhaton Road intersection and the project accesses for level of service. The Synchro Highway Capacity Manual (HCM) methodology reports were used to analyze intersection delay and level of service. **Table 2** summarizes the existing level of service conditions at the 64th Avenue/Powhaton Road intersection while **Table 3** summarizes the level of service conditions for the study intersection and accesses during the short-term and long-term horizons.

Table 2 –Existing Intersection Operational Analysis LOS

Intersection	2024 Existing			
	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
64th & Powhatan	8.3	A	7.5	A
Eastbound Approach	8.1	A	7.4	A
Westbound Approach	0.0	A	7.0	A
Northbound Approach	8.1	A	9.0	A
Southbound Approach	8.9	A	7.3	A
Powhatan Bldg I Full Access #2	Not Analyzed			
Westbound Left				
Westbound Through/Right				
Southbound Left				
Powhatan Inbound Only Access #3				
Southbound Left				
64th Ave West Access #4				
Northbound Approach				
64th Ave East Access #5				
Northbound Approach				
Powhatan Bldg II Full Access #7				
Westbound Approach				
Southbound Left				

Table 3 –Total Intersection Operational Analysis LOS

Intersection	2025 Total				2040 Total #			
	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
64th & Powhatan	9.6	A	11.6	B	35.3	D	39.6	D
Eastbound Approach	9.8	A	10.6	B	48.2	D	47.5	D
Westbound Approach	8.1	A	11.0	B	57.1	E	55.9	E
Northbound Approach	9.8	A	15.3	C	33.2	C	37.7	D
Southbound Approach	10.3	B	10.3	B	18.8	B	26.1	C
Powhatan Bldg I Full Access (2)								
Westbound Left	9.8	A	11.4	B	18.0	C	46.4	E
Westbound Through/Right	8.5	A	8.8	A	11.5	B	12.4	B
Southbound Left	8.6	A	7.6	A	10.2	B	10.3	B
Powhatan Inbound Only Access (3)								
Southbound Left	8.6	A	8.4	A	14.6	B	10.2	B
64th Ave West Access (4)								
Northbound Approach	9.5	A	11.5	B	9.5	A	11.2	B
64th Ave East Access (5)								
Northbound Approach	9.8	A	10.1	B	11.0	B	11.4	B
Powhatan Bldg II Full Access (7)								
Westbound Approach	9.9	A	11.4	B	17.7	C	28.5	D
Southbound Left	8.0	A	7.6	A	11.8	B	10.6	B

= Long-Term Roadway Recommendations

As summarized in the **Table 3**, all movements are anticipated to operate acceptably through the long-term horizon.

The long-term roadway recommendations are consistent with the original TIS. The intersection of 64th Avenue/Powhaton Road will be signalized with dual northbound left turn lanes in the long-term. Additionally, 64th Avenue is planned to be widened to a five-lane roadway section with a two-way left turn center lane.

TURN LANE WARRANT

The City of Aurora defaults to the Colorado Department of Transportation (CDOT) State Highway Access Code guidelines to determine if turn lanes are warranted at studied intersections. CDOT classifies their state highways based on roadway types. It is believed that Powhaton Road and 64th Avenue match the characteristics of a CDOT NR-B roadway. According to the State Highway Access Code for category NR-B roadways, the following threshold applies for determining the need for a turn lane:

- A left turn lane with storage length plus taper length 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 is greater than 40 mph, a deceleration lane and taper is required for any access with a projected peak hour left ingress turning volume greater than 10 vph.
- 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. 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.

Table 4 below summarizes the turn lane warrant evaluation for the short-term horizon.

Table 4 –Turn Lane Warrant Evaluation for Buildout

Intersection	AM / PM Volumes	Threshold (vph)	Warranted?	Turn Lane Length 2025	95 th % Queue (ft) 2025
Powhaton Bldg I Full Access (#2)					
Northbound Right	46 / 34	50	No	Continuous	25'
Southbound Left	9 / 7	25	No	TWLTL	25'
Powhaton Bldg I & II Full Access (#3)					
Northbound Right	39 / 17	50	No	Continuous	25'
Southbound Left	67 / 24	25	Yes	TWLTL	25'
64 th Ave West Access (#4)					
Eastbound Right	36 / 27	50	No	-	DNE
Westbound Left	0 / 0	25	No	-	DNE
64 th Ave East Access (#5)					
Eastbound Right	56 / 15	50	Waived	-	DNE
Westbound Left	0 / 0	25	No	-	DNE
Powhaton Bldg II Full Access (#6)					
Northbound Right	113 / 31	50	Yes (2040)	225'+145'T	25'
Southbound Left	25 / 7	25	No	TWLTL	25'

Of note, left turn lanes along Powhaton Road can be accommodated within the existing two-way left turn center lane. As noted, the northbound right turn lanes can be waived during the short-term horizon based on the Colorado Department of Transportation (CDOT) State Highway Access Code

since the adjacent through volumes are less than 150 vehicles per hour in each travel lane or the right turn movement is not greater than 50 vehicles per hour to warrant an auxiliary right turn lane. However, the development is planning to provide a continuous right turn lane from the Building II full movement access to the Building I full movement access. Of note, by 2040, the westbound left turn lanes along 64th Avenue will be included within the future two-way left turn center lane.

Additionally, the 95th percentile reported queue lengths for the buildout year are not anticipated to exceed the existing or recommended turn lengths. The reported queue length is one vehicle or less for all the movements at the study accesses.

The short-term intersection recommendations and control are illustrated in **Figure 10** and for the long-term intersection recommendations and control are illustrated in **Figure 11** attached.

SIGNAL WARRANT ANALYSIS

A four-hour signal warrant analysis was completed at the intersection of 64th Avenue and Powhatan Road to project the signalization timeline. The total 2025 traffic volumes were used in the four-hour MUTCD signal warrant analysis. These volumes included DIA Building I and II, Porteos PA 3 (located on the northeast corner of 64th Avenue and Jackson Gap Street intersection), and Porteos PA-5 (located north of 64th Avenue, on the west side of Powhatan Road). As shown in **Table 5** below, the volumes are not nearing the signal warrant volume threshold since none of the hours meet the volume threshold of warranting a signal. Additionally, the attached MUTCD Figure 4C-2 is attached for reference.

Table 5 –Signal Warrant Analysis

	MAJOR ST BOTH APPROACHES 64th Avenue	MINOR ST HIGHEST APPROACH Powhatan Road	Warrant 1 - Condition A			Warrant 1 - Condition B			WARRANT 2	WARRANT 3
			MAJOR STREET	MINOR STREET	BOTH MET	MAJOR STREET	MINOR STREET	BOTH MET		
THRESHOLD VALUES			500	150		750	75			
06:00 AM TO 07:00 AM	0	0								
07:00 AM TO 08:00 AM	325	75					Y			
08:00 AM TO 09:00 AM	306	53								
09:00 AM TO 10:00 AM	0	0								
10:00 AM TO 11:00 AM	0	0								
11:00 AM TO 12:00 PM	0	0								
12:00 PM TO 01:00 PM	0	0								
01:00 PM TO 02:00 PM	0	0								
02:00 PM TO 03:00 PM	0	0								
03:00 PM TO 04:00 PM	0	0								
04:00 PM TO 05:00 PM	243	113					Y			
05:00 PM TO 06:00 PM	354	141					Y			
06:00 PM TO 07:00 PM	0	0								
07:00 PM TO 08:00 PM	0	0								
08:00 PM TO 09:00 PM	0	0								
09:00 PM TO 10:00 PM	0	0								
	1,228	382	0			0			0	0
			8 HOURS NEEDED NOT SATISFIED			8 HOURS NEEDED NOT SATISFIED			4 HRS NEEDED NOT SATISFIED	1 HR NEEDED NOT SATISFIED

CONCLUSIONS


In summary, the current proposal generates 1,512 more daily trips with 164 fewer trips in the morning peak hour, and 236 more trips in the afternoon peak hour when compared to the original traffic study. However, the existing intersection geometry and control at 64th Avenue and Powhaton Road is reported to accommodate the project traffic and the background traffic in 2025. Therefore, the project is believed to be in traffic compliance with the *Porteos Industrial Traffic Impact Study* intersection short term and long-term recommendations at the study intersection. However, the recommendation changes from the original traffic study at the access intersections are the following:

- Close the existing east access along 64th Avenue and provide a new access (#5) approximately 380 feet east of the closed access. The northbound approach of this access is recommended to operate with stop control with separate left and right turn lanes. No turn lanes are warranted along 64th Avenue into the site access.
- The inbound only access (#3) has evolved from the full movement access originally proposed in the traffic study. This access is proposed to restrict conflicting movements by only allowing southbound left and northbound right movements into the access.
- Northbound right turn lanes are not warranted at the project accesses along Powhaton Road in the short-term horizon based on the adjacent through traffic being less than 150 vehicles per lane. However, the development is planning to construct a northbound right continuous turn lane from Building II full movement access to Building I full movement access.

By the long-term horizon and full buildout of the surrounding developments, the intersection of 64th Avenue and Powhaton Road is anticipated to need dual northbound left turn lanes and is expected to warrant signalization. Additionally, 64th Avenue is planned to be widened to provide two through lanes in each direction. These recommendations are consistent with the original TIS recommendations. If you have any questions or require anything further, please feel free to call me at (720) 943-9962.

Sincerely,

KIMLEY-HORN AND ASSOCIATES, INC.

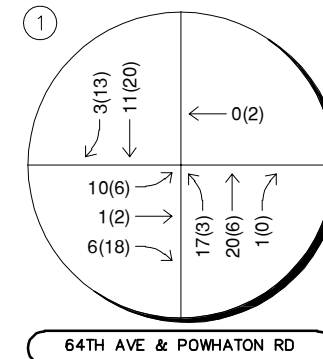
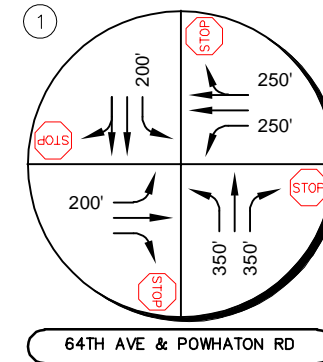

Mary Gormley, P.E.
Project Traffic Engineer



Figures



FIGURE 1
DIA BUILDING I & II
AURORA, COLORADO
VICINITY MAP



Wednesday, February 21, 2024
 7:00 to 8:00AM (4:00 to 5:00PM)

FIGURE 2
 DIA BUILDING I & II
 AURORA, COLORADO
 EXISTING GEOMETRY AND CONTROL/TRAFFIC VOLUMES

LEGEND	
(X)	Study Area Key Intersection
STOP	Stop Controlled Approach
100'	Turn Lane Length (feet)
xxx(xxx)	Weekday AM(PM) Peak Hour Traffic Volumes

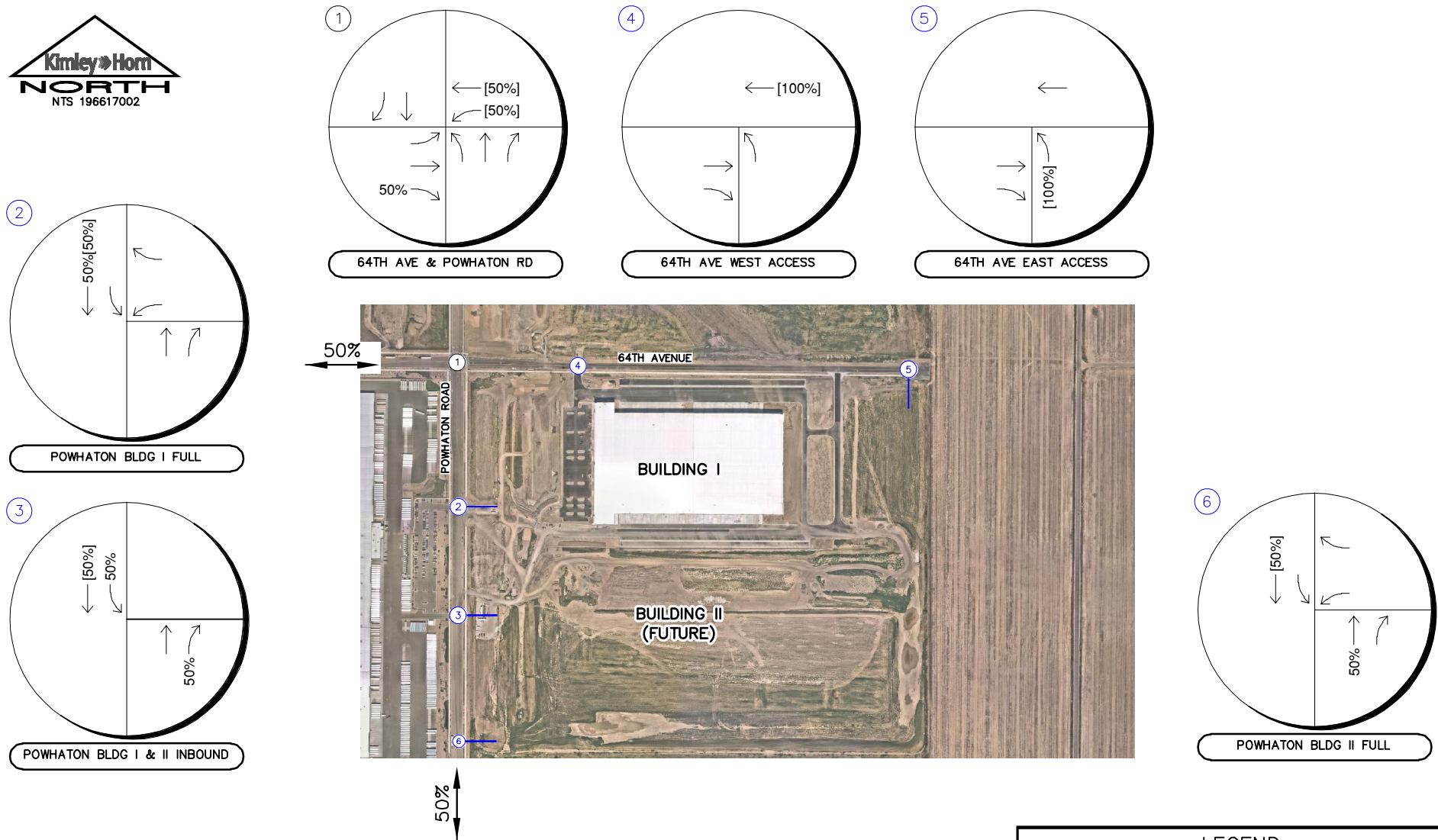
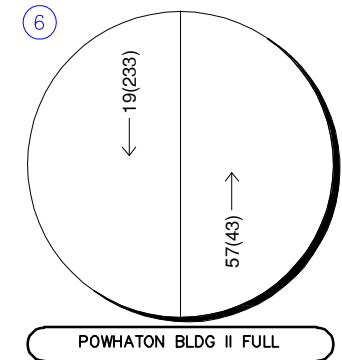
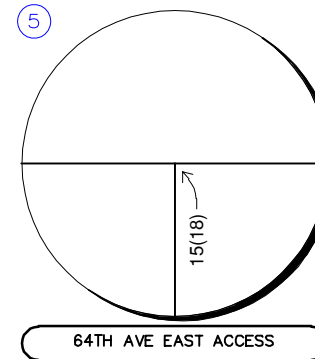
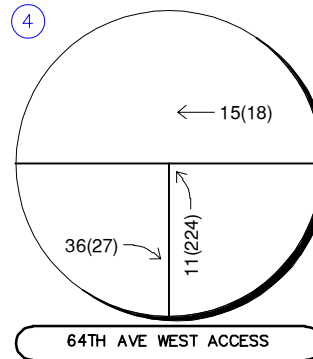
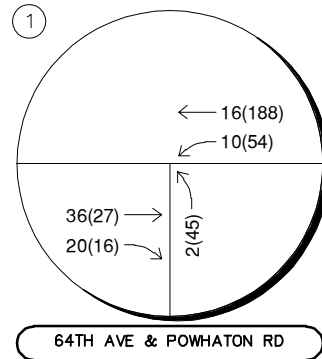
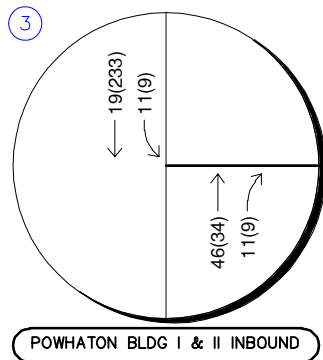
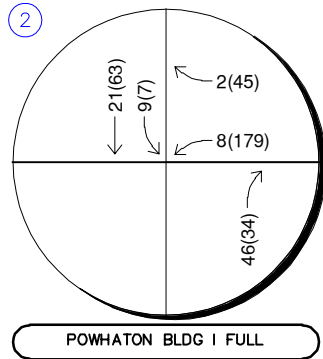


FIGURE 4
 DIA BUILDING I & II
 AURORA, COLORADO
 PROJECT (TRUCK) TRIP DISTRIBUTION — BUILDING I

LEGEND	
(X)	Study Area Key Intersection
(X)	Project Access Intersection
XX%	External Trip Distribution Percentage
XX%[XX%]	Entering[Exiting] Trip Distribution Percentage



Note: The project traffic assignment may be up to +/- 2 trips compared to the trip generation table due to rounding.

FIGURE 5
DIA BUILDING I & II
AURORA, COLORADO
PROJECT TRAFFIC ASSIGNMENT — BUILDING I

LEGEND

- (X) Study Area Key Intersection
- (X) Project Access Intersection
- XXX(XXX) Weekday AM(PM)
Peak Hour Traffic Volumes
- XX,X00 Estimated Daily Traffic Volume

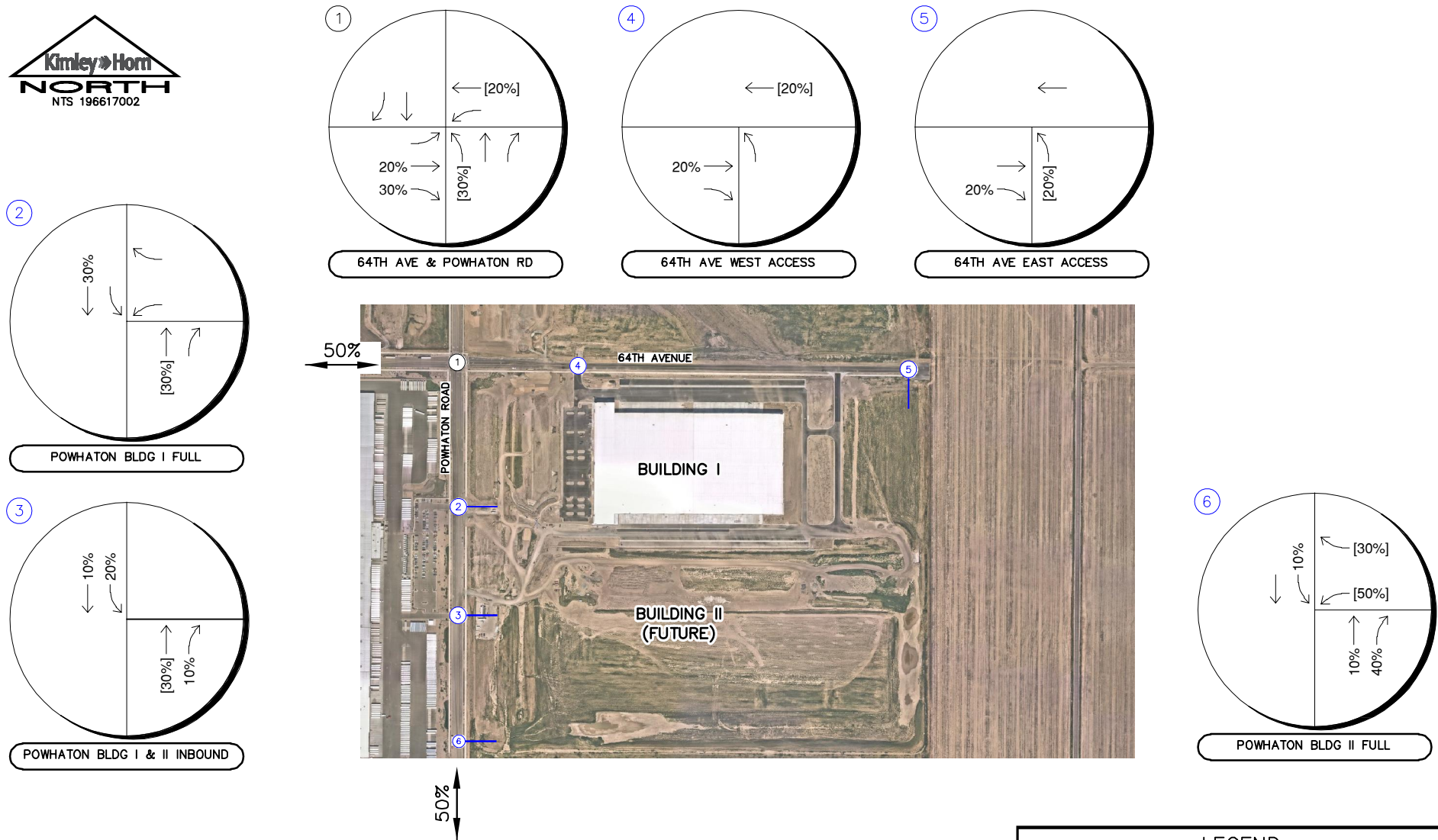
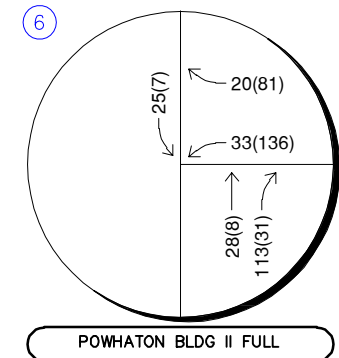
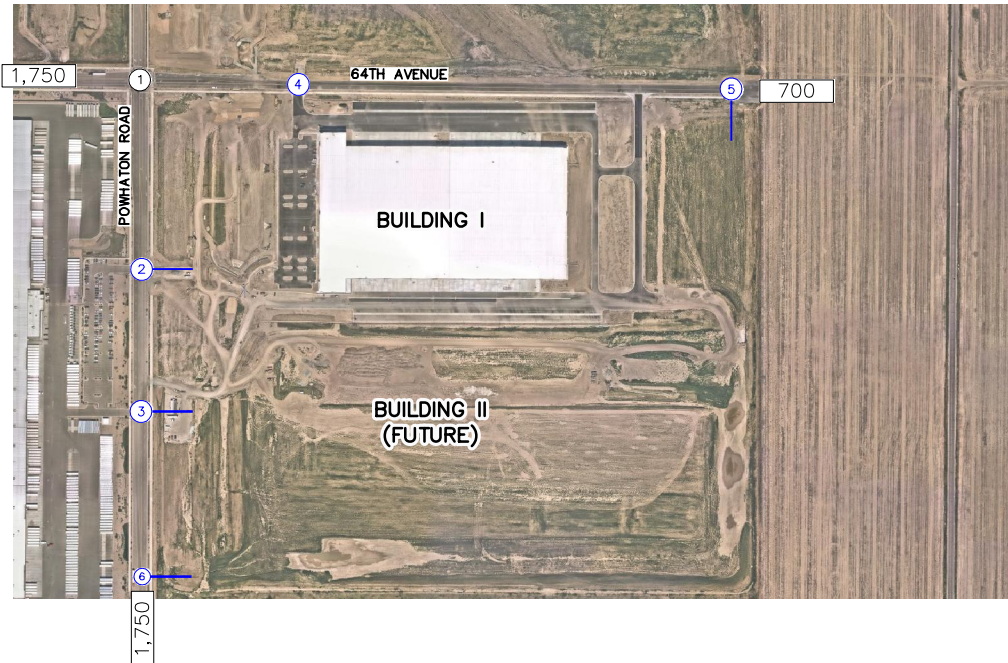
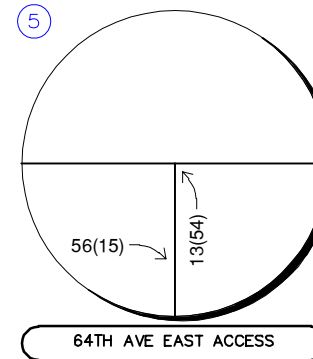
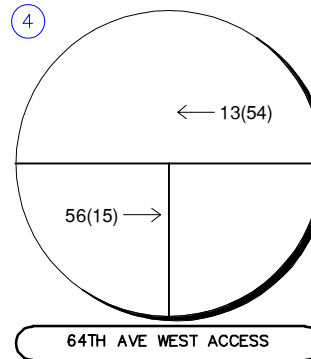
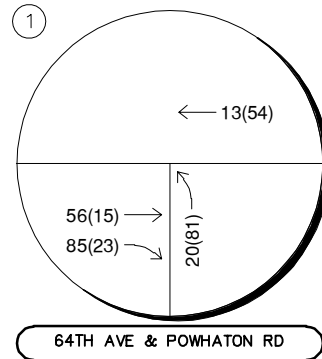
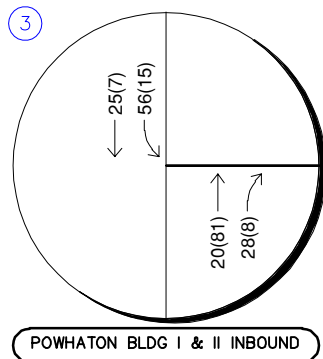
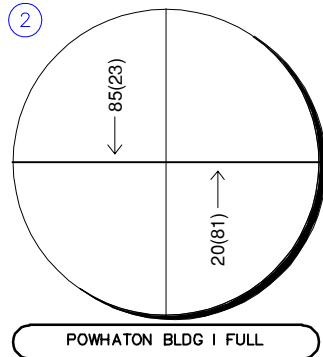


FIGURE 6
 DIA BUILDING I & II
 AURORA, COLORADO
 PROJECT TRIP DISTRIBUTION – BUILDING II

LEGEND	
(X)	Study Area Key Intersection
(X)	Project Access Intersection
XX%	External Trip Distribution Percentage
XX%[XX%]	Entering[Exiting] Trip Distribution Percentage



Note: The project traffic assignment may be up to +/- 2 trips compared to the trip generation table due to rounding.

FIGURE 7
 DIA BUILDING I & II
 AURORA, COLORADO
 PROJECT TRAFFIC ASSIGNMENT — BUILDING II

LEGEND	
(X)	Study Area Key Intersection
(X)	Project Access Intersection
XX%	External Trip Distribution Percentage
XX%[XX%]	Entering[Exiting] Trip Distribution Percentage

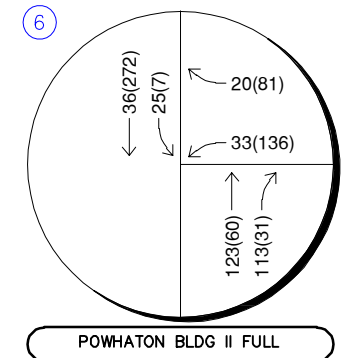
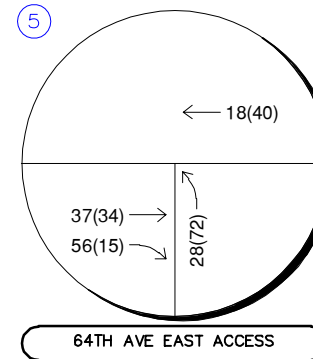
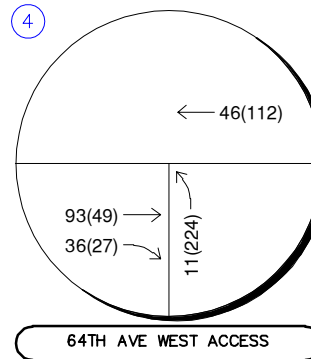
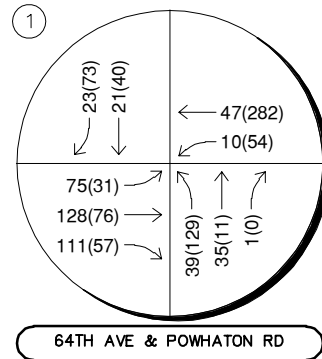
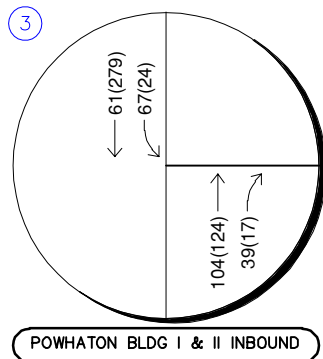
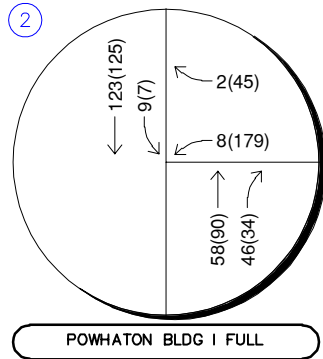


FIGURE 8
 DIA BUILDING I & II
 AURORA, COLORADO
 2025 TOTAL TRAFFIC VOLUMES

LEGEND	
(X)	Study Area Key Intersection
(X)	Project Access Intersection
XXX(XXX)	Weekday AM(PM)
	Peak Hour Traffic Volumes
XX,X00	Estimated Daily Traffic Volume

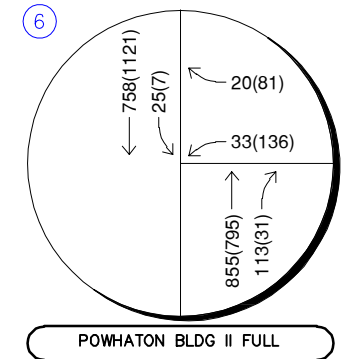
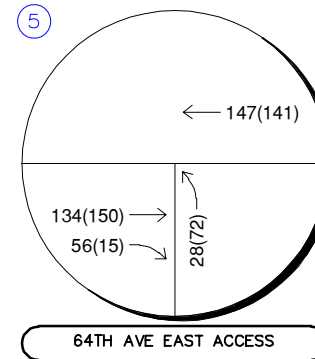
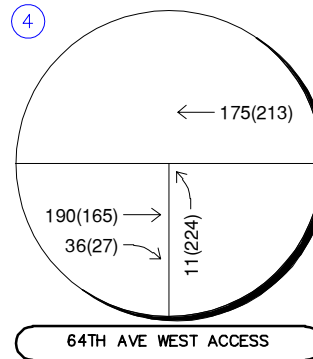
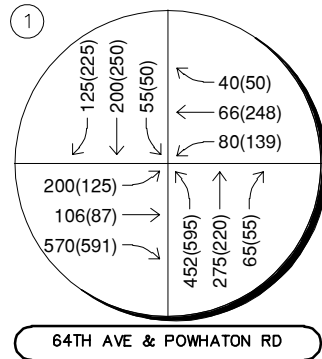
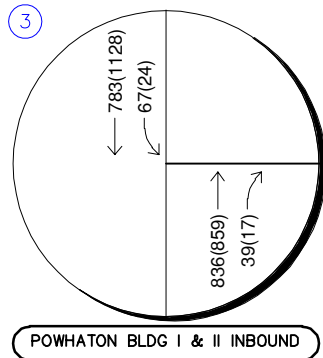
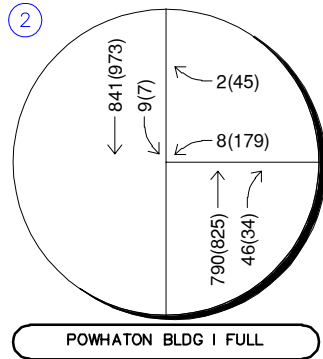
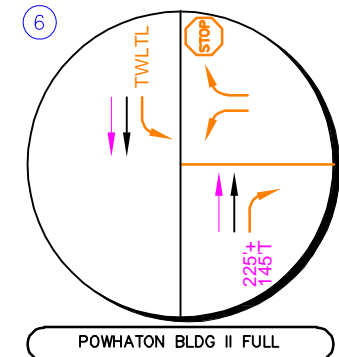
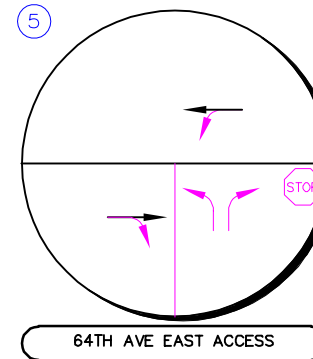
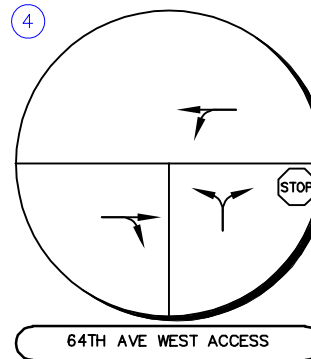
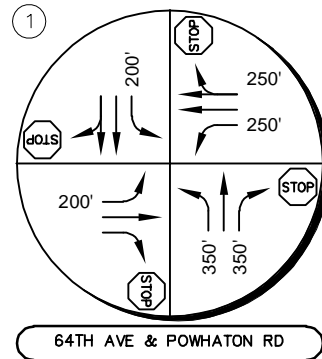
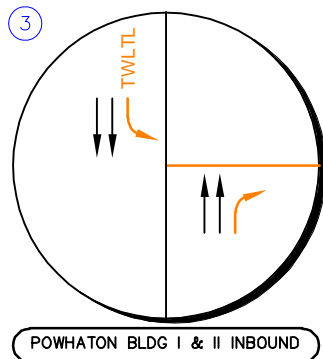
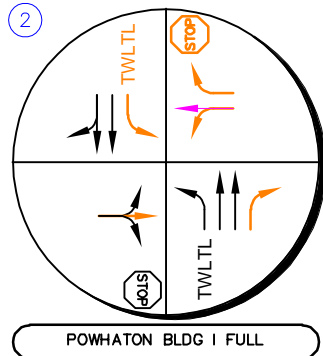


FIGURE 9
 DIA BUILDING I & II
 AURORA, COLORADO
 2040 TOTAL TRAFFIC VOLUMES

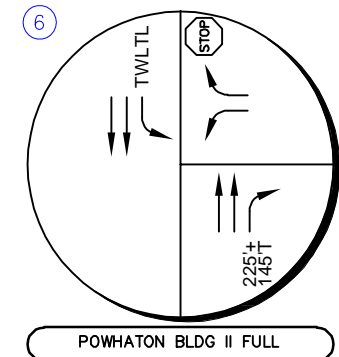
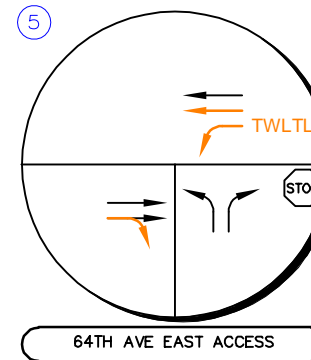
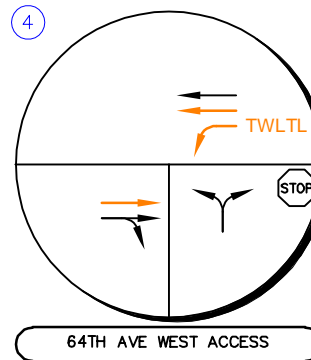
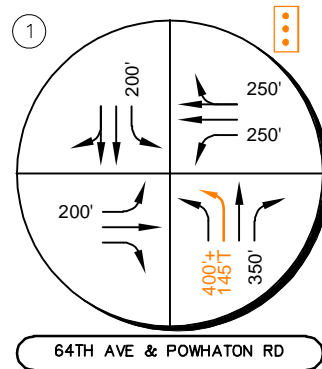
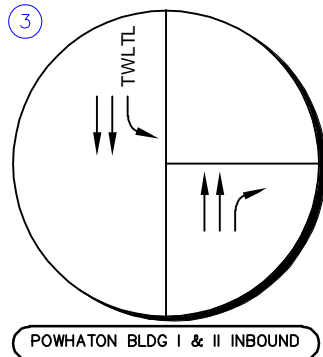
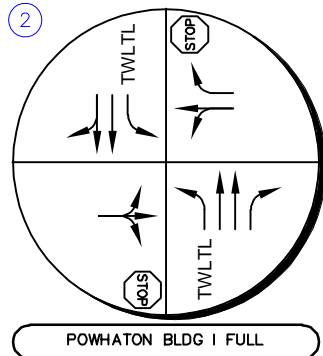
LEGEND	
(X)	Study Area Key Intersection
(X)	Project Access Intersection
XXX(XXX)	Weekday AM(PM)
	Peak Hour Traffic Volumes
XX,X00	Estimated Daily Traffic Volume



LEGEND

- (X) Study Area Key Intersection
- (X) Project Access Intersection
- STOP Stop Controlled Approach
- Recommendation from Original Traffic Study
- Change in Improvement from Original Traffic Study
- 100' Turn Lane Length (feet)

FIGURE 10
DIA BUILDING I & II
AURORA, COLORADO
2025 RECOMMENDED GEOMETRY AND CONTROL



LEGEND

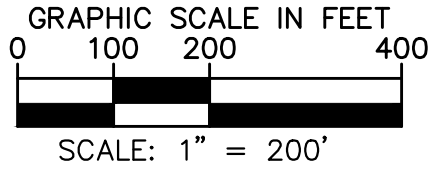
- (X) Study Area Key Intersection
- (X) Project Access Intersection
- (STOP) Stop Controlled Approach
- Orange arrow Recommendation from Original Traffic Study
- Pink arrow Change in Improvement from Original Traffic Study
- 100' Turn Lane Length (feet)









FIGURE 11
 DIA BUILDING I & II
 AURORA, COLORADO
 2040 RECOMMENDED GEOMETRY AND CONTROL

Conceptual Site Plan

LOCATED IN THE NW $\frac{1}{4}$ OF SECTION 9,
TOWNSHIP 3 SOUTH, RANGE 65 WEST OF THE 6TH P.M.,
CITY OF AURORA, ADAMS COUNTY, STATE OF COLORADO

TOWNSHIP 3 SOUTH, RANGE 65 WEST OF THE 6TH P.M.,
CITY OF AURORA, ADAMS COUNTY, STATE OF COLORADO



- | | |
|--|-----------------------|
|  | EXISTING FIRE HYDRANT |
|  | FIRE HYDRANT |
|  | FDC W/ KNOX HARDWARE |
|  | KNOX BOX |
|  | EXISTING GRAVEL |
|  | EXISTING CONCRETE |
|  | CONCRETE SIDEWALK |
|  | HEAVY DUTY CONCRETE |

OWNER: CITY AND COUNTY OF
DENVER ATTN REAL ESTATE DEPT
JURISDICTION: ADAMS COUNTY

K: \DEN_Civil\196617002 DIA1\CADD\PlanSheets\CSP\196617002_SP OV.dwg Cooney, Brad 5/15/2024 9:00 AM

6200 S. Syracuse Way #300
Greenwood Village, CO 80111 (303) 2

OVERALL SITE PLAN

CHECKED BY: BJC

196617002

O.

1

Original Traffic Study Documents

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

Porteos Industrial

Aurora, Colorado

Prepared for
DIA Property Trust V, LLC
2404 Belknap Beach Road
Prospect, KY 40059

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



August 2021

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.

4.0 PROJECT TRAFFIC CHARACTERISTICS

4.1 Trip Generation

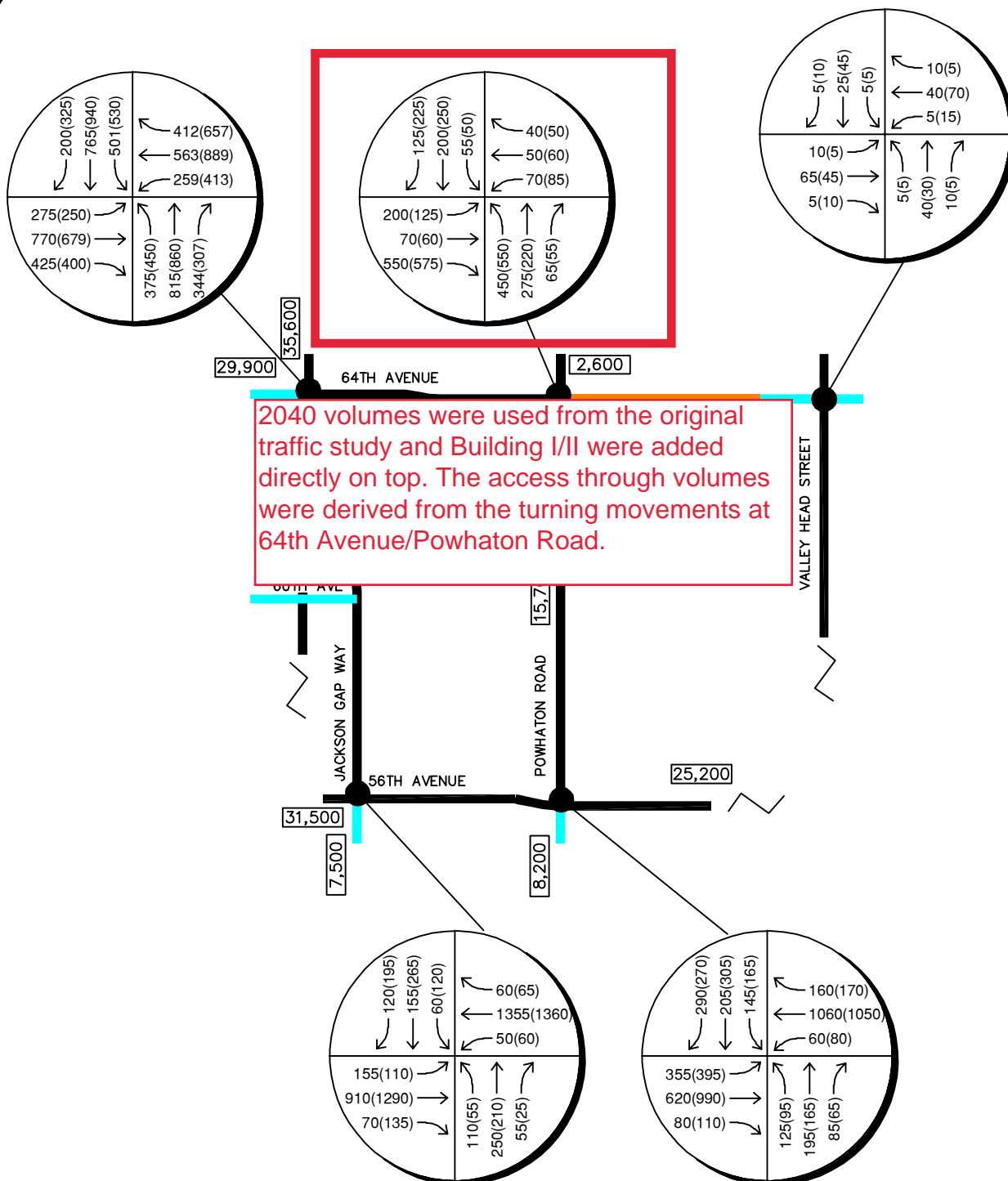
Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land uses to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Manual*¹ published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. For this study, Kimley-Horn used the ITE Trip Generation Report average rates that applies to Industrial Park (ITE Code 130) for traffic associated with the development.

For the purposes of this analysis, the project is anticipated to include approximately 1,653,000 square feet of industrial building space. The Porteos Industrial project is expected to generate approximately 5,572 daily weekday trips, with 661 trips occurring during the morning peak hour and 662 trips occurring during the afternoon peak hour. Calculations were based on the procedure and information provided in the ITE *Trip Generation Manual, 10th Edition – Volume 1: User's Guide and Handbook*, 2017. **Table 1** summarizes the estimated trip generation for the proposed development. The trip generation worksheets are included in **Appendix B**.

Table 1 – Porteos Industrial Traffic Generation

Land Use	Weekday Vehicle Trips						
	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Industrial Park (ITE 130) – 1,653,000 Square Feet	5,572	535	126	661	139	523	662

¹ Institute of Transportation Engineers, *Trip Generation Manual*, Tenth Edition, Washington DC, 2017.



PORTEOS INDUSTRIAL
AURORA, CO
2040 BACKGROUND TRAFFIC VOLUMES

LEGEND

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

FIGURE 5

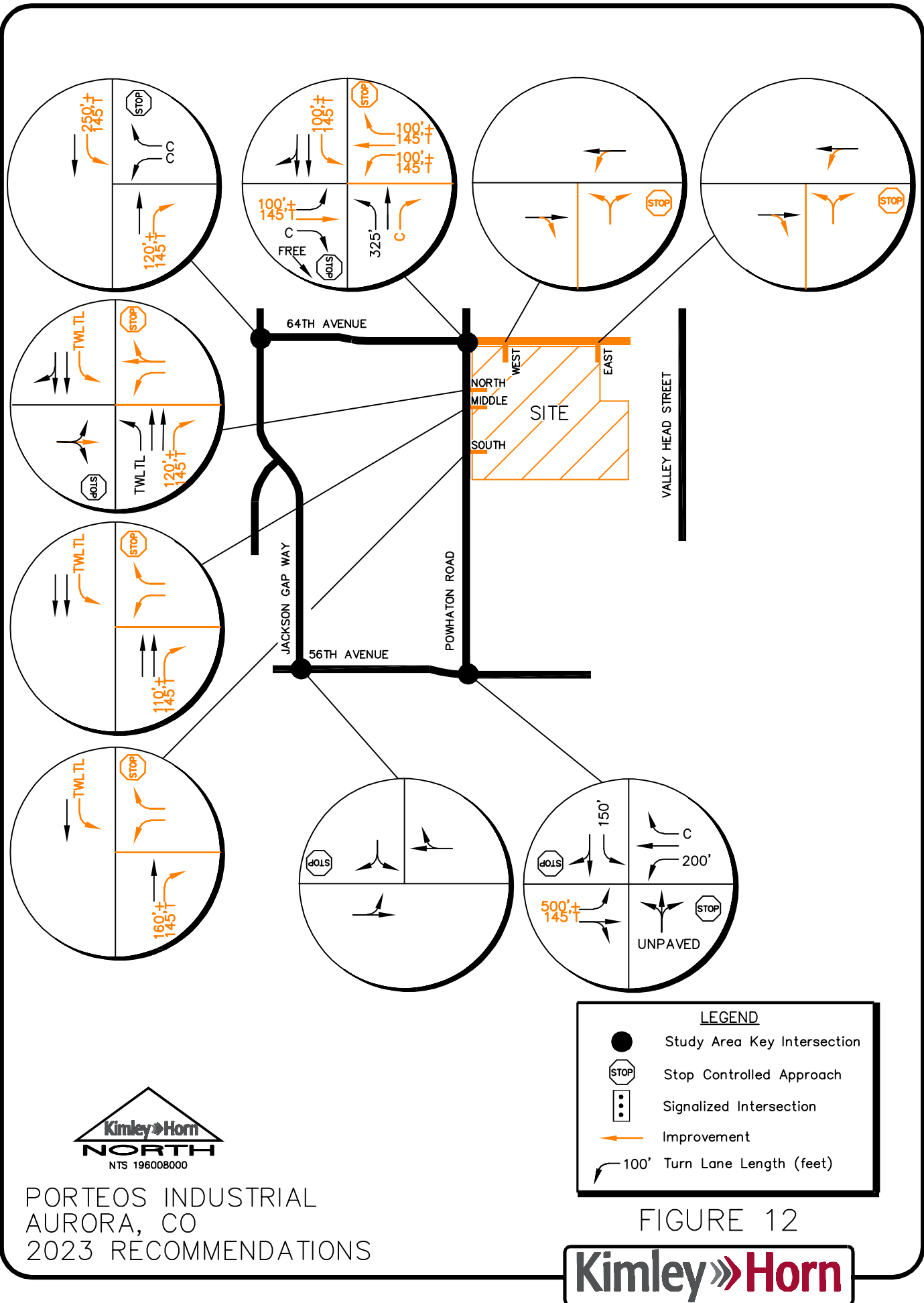
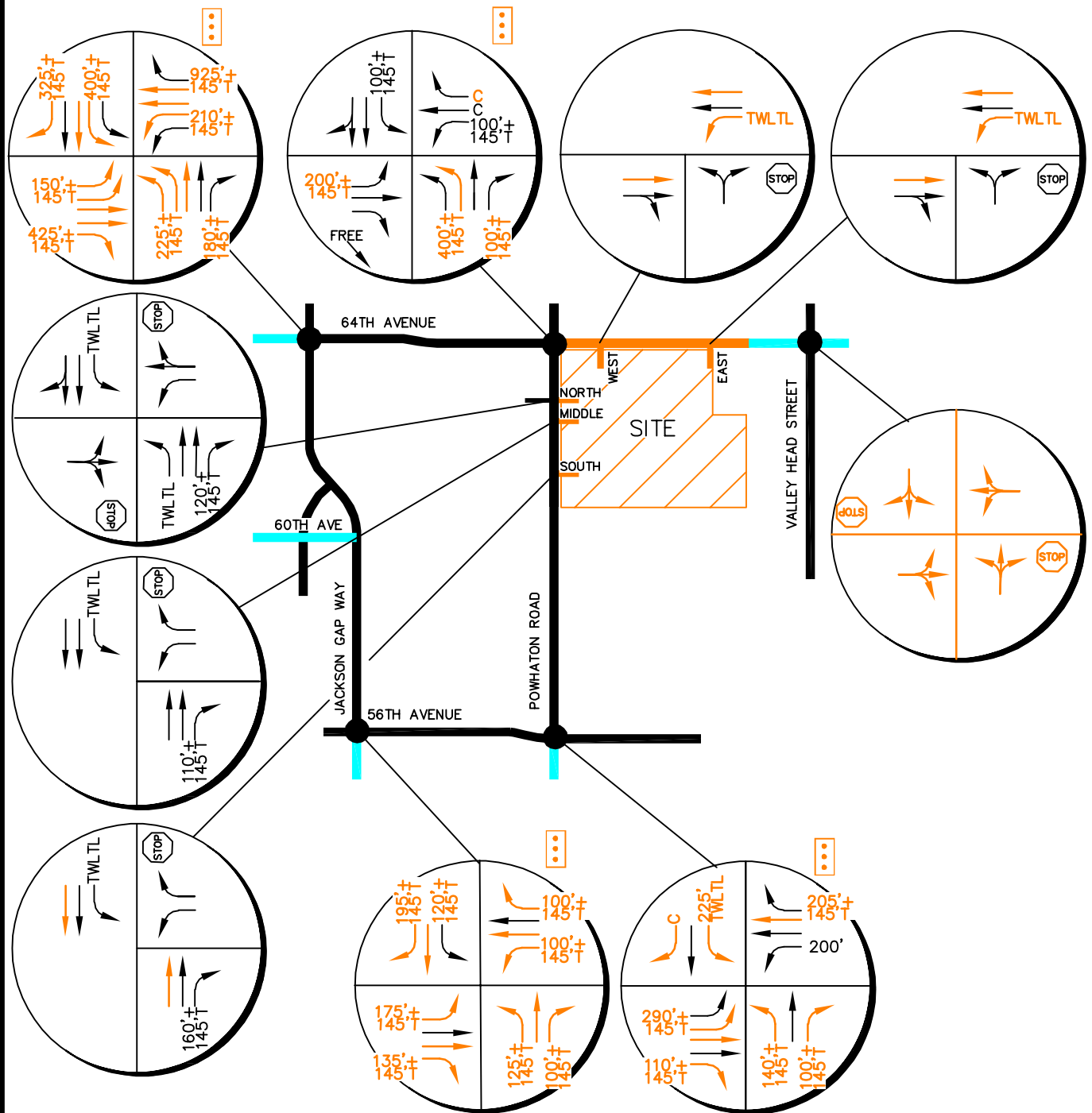


FIGURE 12

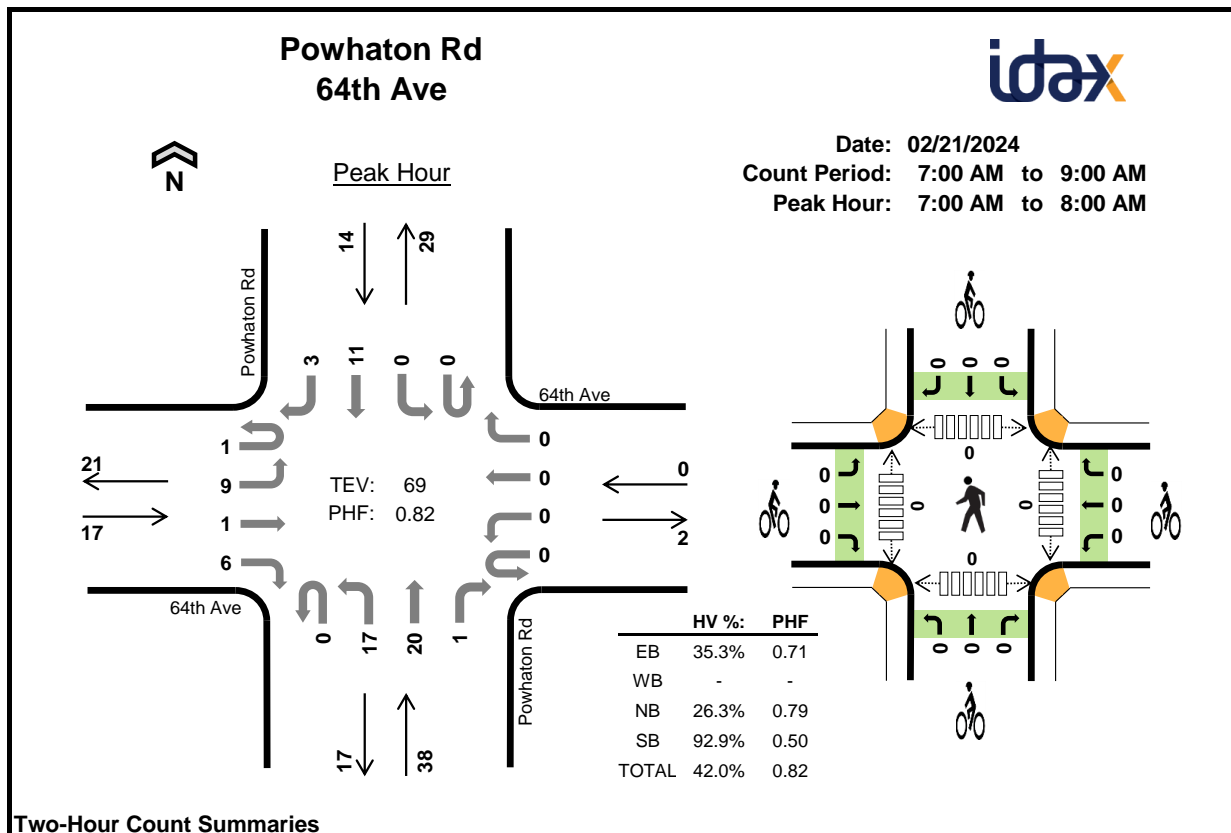


PORTEOS INDUSTRIAL
AURORA, CO
2040 RECOMMENDATIONS

FIGURE 13



Turning Movement Counts

**Two-Hour Count Summaries**

Interval Start		64th Ave				64th Ave				Powhatan Rd				Powhatan Rd				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM		0	2	0	1	0	0	0	0	0	6	3	1	0	0	6	1	20	0
7:15 AM		1	3	0	0	0	0	0	0	0	2	5	0	0	0	1	0	12	0
7:30 AM		0	2	0	2	0	0	0	0	0	6	3	0	0	0	1	2	16	0
7:45 AM		0	2	1	3	0	0	0	0	0	3	9	0	0	0	3	0	21	69
8:00 AM		0	2	0	3	0	0	0	0	0	2	3	0	0	0	3	0	13	62
8:15 AM		0	2	2	2	0	1	0	0	0	2	2	0	0	0	3	2	16	66
8:30 AM		0	1	0	2	0	1	0	0	1	3	1	0	0	0	2	1	12	62
8:45 AM		1	2	0	2	0	0	0	0	0	1	2	0	0	0	1	0	9	50
Count Total		2	16	3	15	0	2	0	0	1	25	28	1	0	0	20	6	119	0
Peak Hour	All	1	9	1	6	0	0	0	0	0	17	20	1	0	0	11	3	69	0
	HV	1	1	0	4	0	0	0	0	0	6	4	0	0	0	10	3	29	0
	HV%	100%	11%	0%	67%	-	-	-	-	-	35%	20%	0%	-	-	91%	100%	42%	0

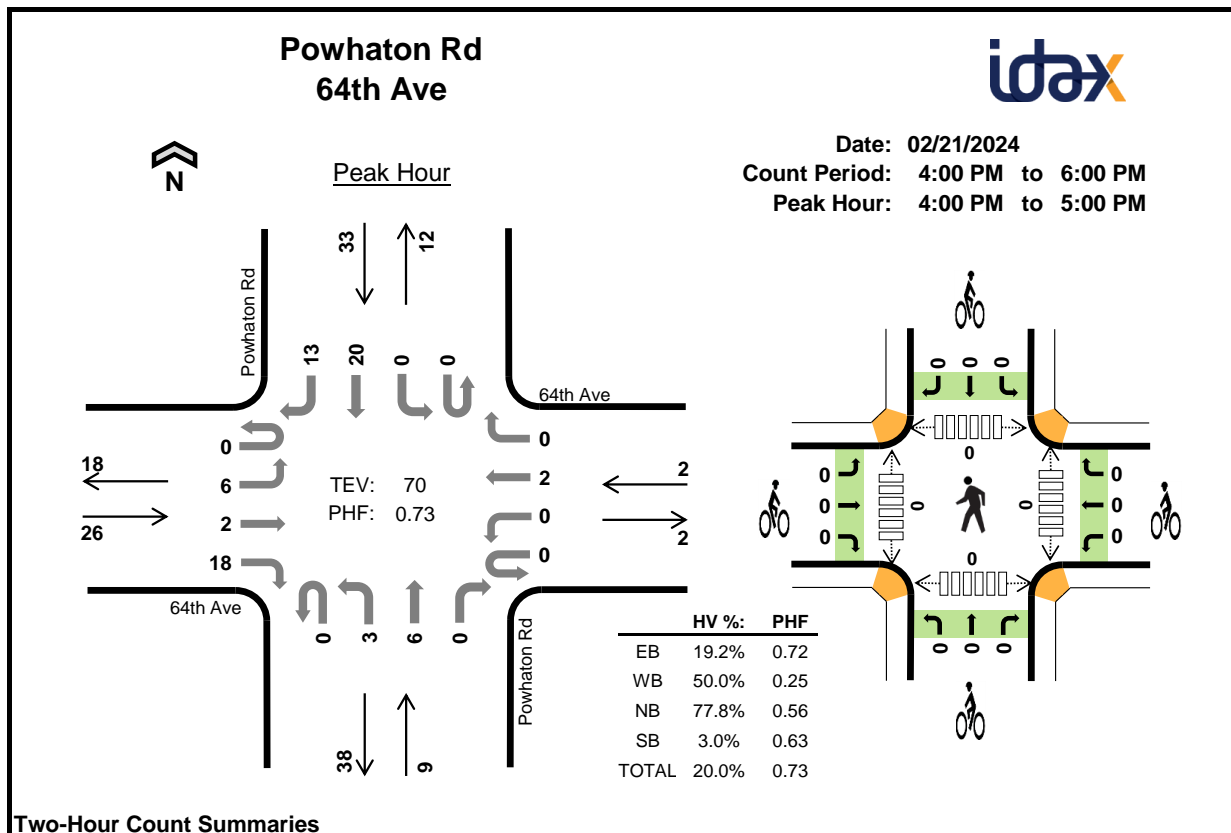
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

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	2	0	4	6	12	0	0	0	0	0	0	0	0	0	0
7:15 AM	1	0	2	1	4	0	0	0	0	0	0	0	0	0	0
7:30 AM	2	0	2	3	7	0	0	0	0	0	0	0	0	0	0
7:45 AM	1	0	2	3	6	0	0	0	0	0	0	0	0	0	0
8:00 AM	3	0	0	2	5	0	0	0	0	0	0	0	0	0	0
8:15 AM	3	0	0	3	6	0	0	0	0	0	0	0	0	0	0
8:30 AM	2	1	3	2	8	0	0	0	0	0	0	0	0	0	0
8:45 AM	4	0	1	1	6	0	0	0	0	0	0	0	0	0	0
Count Total	18	1	14	21	54	0	0	0	0	0	0	0	0	0	0
Peak Hour	6	0	10	13	29	0	0	0	0	0	0	0	0	0	0

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	64th Ave				64th Ave				Powhatan Rd				Powhatan Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	0	1	0	0	0	0	0	2	2	0	0	0	5	1	12	0
7:15 AM	1	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	4	0
7:30 AM	0	0	0	2	0	0	0	0	0	2	0	0	0	0	1	2	7	0
7:45 AM	0	0	0	1	0	0	0	0	0	1	1	0	0	0	3	0	6	29
8:00 AM	0	2	0	1	0	0	0	0	0	0	0	0	0	0	2	0	5	22
8:15 AM	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	2	6	24
8:30 AM	0	0	0	2	0	1	0	0	1	2	0	0	0	0	1	1	8	25
8:45 AM	1	2	0	1	0	0	0	0	0	0	1	0	0	0	1	0	6	25
Count Total	2	6	1	9	0	1	0	0	1	8	5	0	0	0	15	6	54	0
Peak Hour	1	1	0	4	0	0	0	0	0	6	4	0	0	0	10	3	29	0

Two-Hour Count Summaries - Bikes																		
Interval Start	64th Ave			64th Ave			Powhatan Rd			Powhatan Rd			15-min Total	Rolling One Hour				
	Eastbound			Westbound			Northbound			Southbound								
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT						
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

**Two-Hour Count Summaries**

Interval Start		64th Ave				64th Ave				Powhatan Rd				Powhatan Rd				15-min Total	Rolling One Hour
		Eastbound				Westbound				Northbound				Southbound					
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	3	2	4	0	0	2	0	0	1	3	0	0	0	7	2	24	0
4:15 PM		0	2	0	5	0	0	0	0	0	0	0	0	0	0	7	6	20	0
4:30 PM		0	1	0	6	0	0	0	0	0	2	1	0	0	0	3	3	16	0
4:45 PM		0	0	0	3	0	0	0	0	0	0	2	0	0	0	3	2	10	70
5:00 PM		0	0	0	5	0	0	0	0	0	0	0	0	0	0	6	0	11	57
5:15 PM		0	0	0	0	0	0	0	0	0	1	1	0	0	0	3	0	5	42
5:30 PM		0	1	0	3	0	0	0	0	0	2	2	0	0	0	2	0	10	36
5:45 PM		0	1	0	2	0	0	0	0	0	0	0	0	0	0	5	1	9	35
Count Total		0	8	2	28	0	0	2	0	0	6	9	0	0	0	36	14	105	0
Peak Hour	All	0	6	2	18	0	0	2	0	0	3	6	0	0	0	20	13	70	0
	HV	0	4	1	0	0	0	1	0	0	2	5	0	0	0	0	1	14	0
	HV%	-	67%	50%	0%	-	-	50%	-	-	67%	83%	-	-	-	0%	8%	20%	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	4	1	3	1	9	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0
5:00 PM	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
5:30 PM	1	0	3	0	4	0	0	0	0	0	0	0	0	0	0
5:45 PM	3	0	0	0	3	0	0	0	0	0	0	0	0	0	0
Count Total	12	1	11	1	25	0	0	0	0	0	0	0	0	0	0
Peak Hour	5	1	7	1	14	0	0	0	0	0	0	0	0	0	0

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	64th Ave				64th Ave				Powhatan Rd				Powhatan Rd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	3	1	0	0	0	1	0	0	1	2	0	0	0	0	1	9	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	3	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2	14
5:00 PM	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3	8
5:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	9
5:30 PM	0	1	0	0	0	0	0	0	0	2	1	0	0	0	0	0	4	10
5:45 PM	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	3	11
Count Total	0	6	1	5	0	0	1	0	0	5	6	0	0	0	0	1	25	0
Peak Hour	0	4	1	0	0	0	1	0	0	2	5	0	0	0	0	1	14	0

Two-Hour Count Summaries - Bikes																		
Interval Start	64th Ave			64th Ave			Powhatan Rd			Powhatan Rd			15-min Total	Rolling One Hour				
	Eastbound			Westbound			Northbound			Southbound								
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT						
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
Peak Hour	0	0	0	0	0	0	0	0	0	0	0	0	0	0				

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

Background Traffic Studies

TRANSPORTATION IMPACT STUDY

Porteos PA 5 – JAG Logistics Center at DIA
68th Avenue and Powhaton Road in Aurora

Prepared for:

Green Industrial Development Group, LLC
10 Glenville Street
Greenwich, CT 06831

Prepared by:

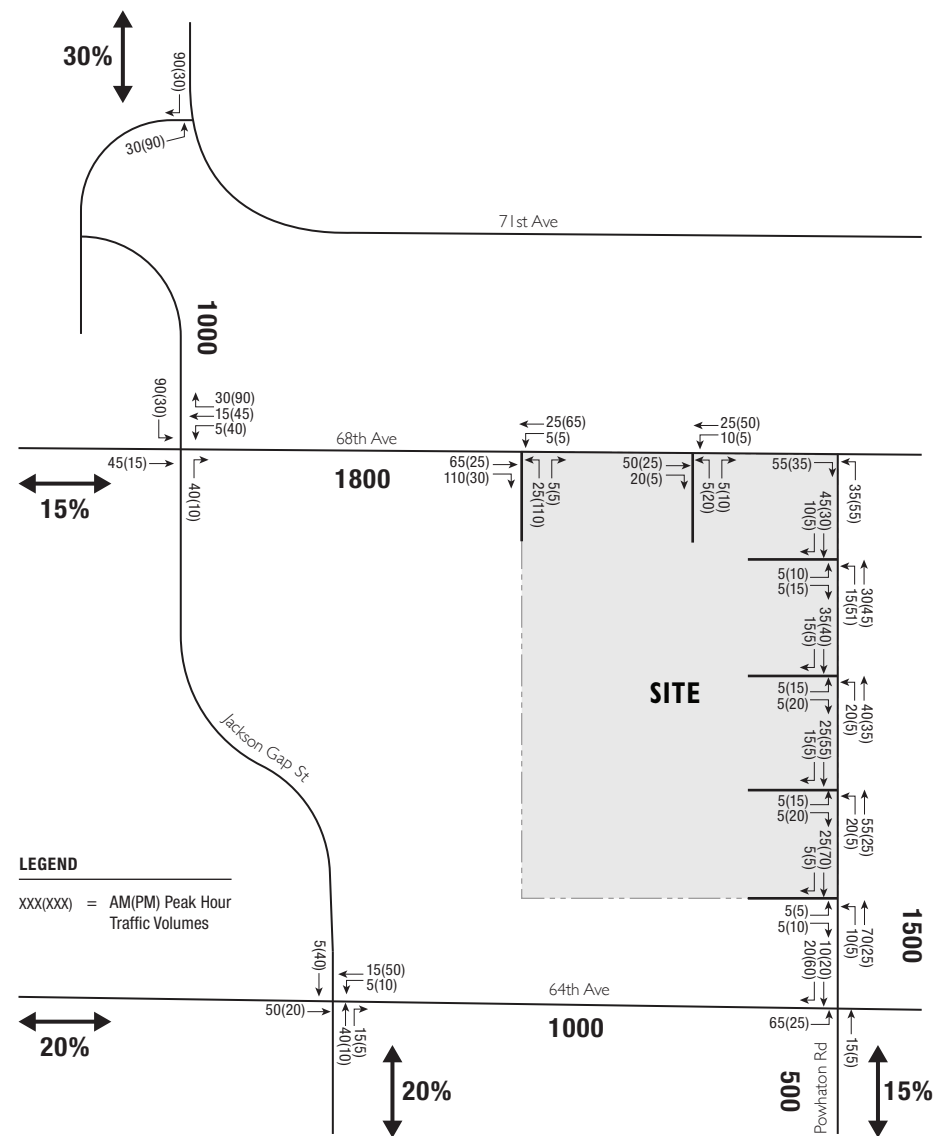
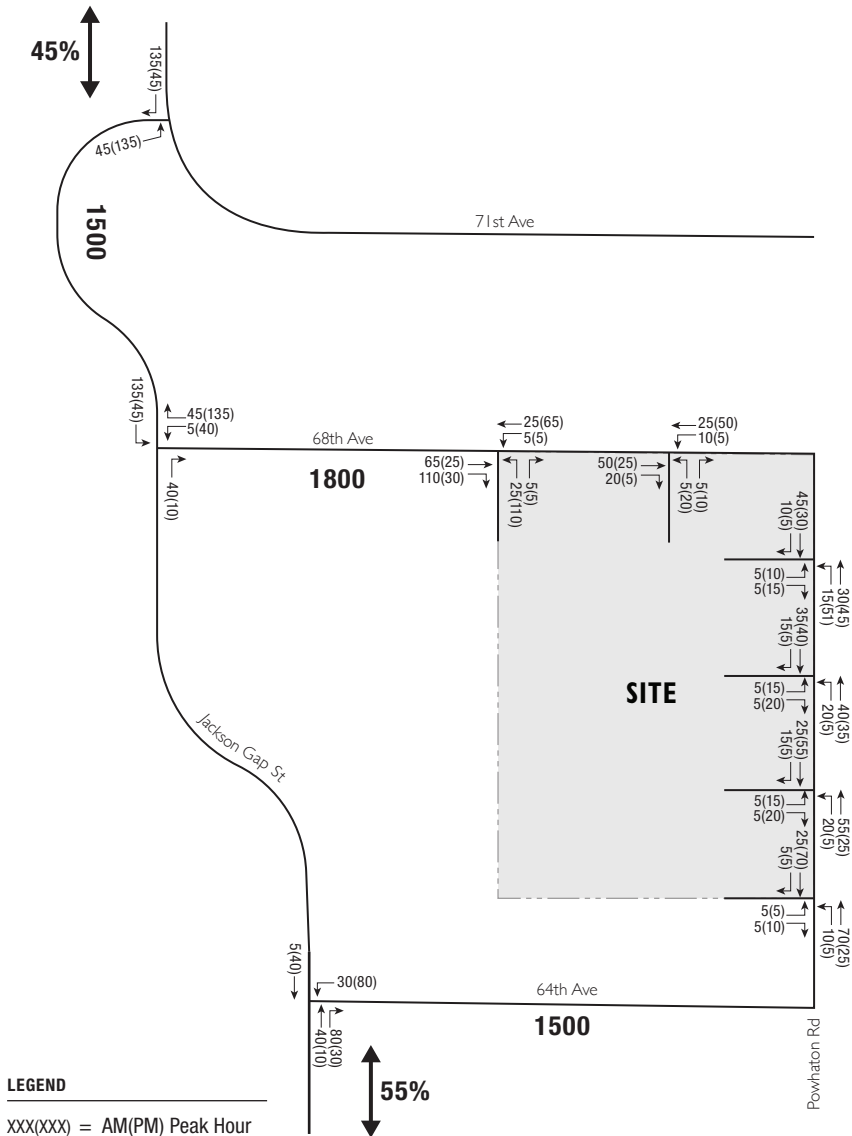
Felsburg Holt & Ullevig
6300 South Syracuse Way, Suite 600
Centennial, CO 80111
303.721.1440

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



FHU Reference No. 118232-03

June 2019



TRANSPORTATION IMPACT STUDY

Porteos PA 3 - Jackson Gap Commercial in Aurora

Prepared for:

ACP DIA 1287 Holdings, LLC
4530 East Shea Blvd., Suite 100
Phoenix, AZ 85028

Prepared by:

Felsburg Holt & Ullevig
6300 South Syracuse Way, Suite 600
Centennial, CO 80111
303.721.1440

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



FHU Reference No. 119494-01

February 2020

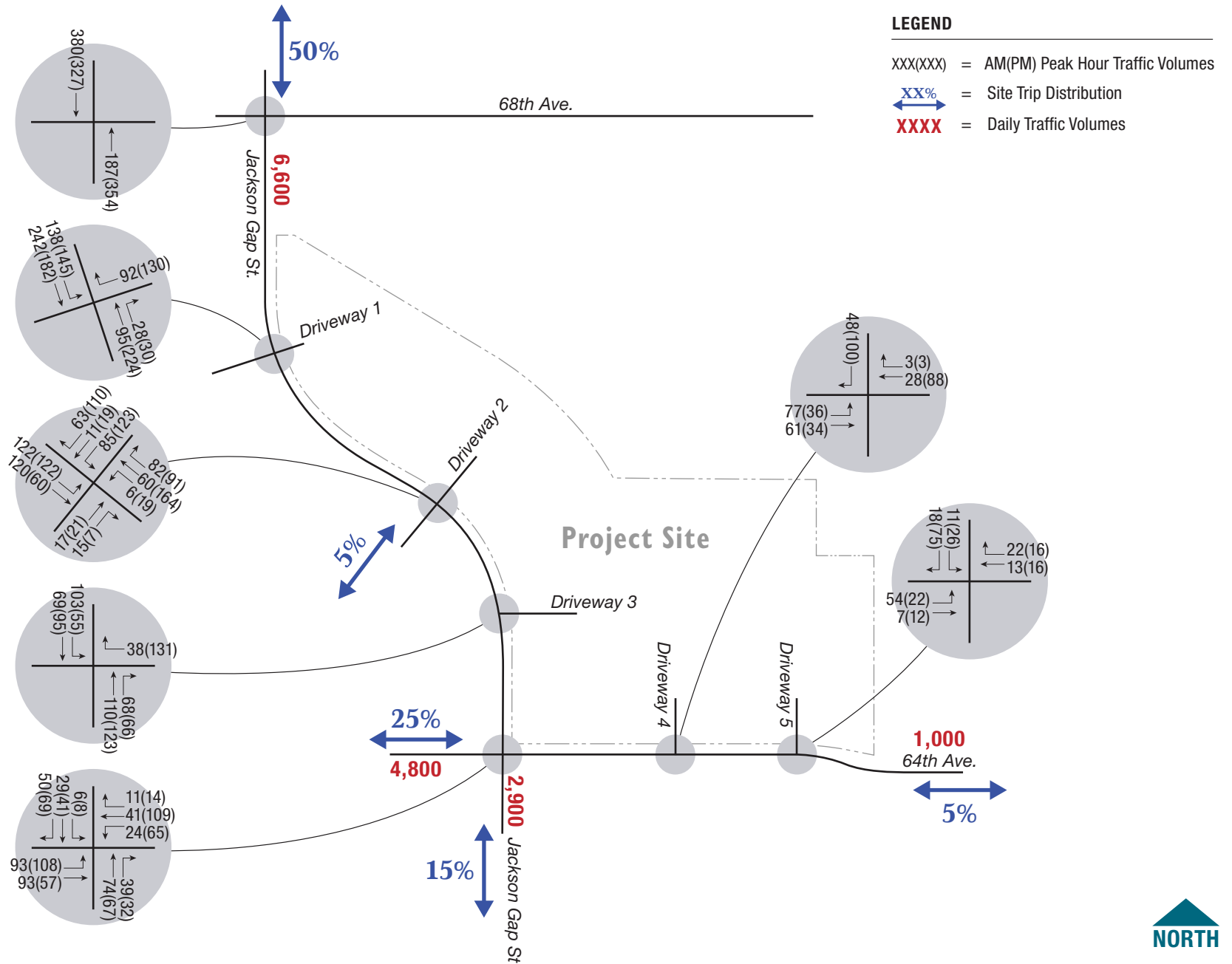


FIGURE 5
Site Generated Traffic
and Distribution

Trip Generation Worksheets

Project DIA Porteos
 Subject Trip Generation for Industrial Park
 Designed by MAG Date February 29, 2024 Job No. 196617002
 Checked by _____ Date _____ Sheet No. _____ of _____

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Average Rates

Land Use Code - Industrial Park (130)

Independent Variable - 1000 Square Feet (X)

SF = 1,024,501

X = 1024.501

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (100 Series Page 49)

(T) = 0.34 (X)	Directional Distribution:	81% ent.	19% exit.
(T) = 0.34 * (1024.5)	T = 348	Average Vehicle Trip Ends	
	282 entering	66	exiting
	282 + 66 = 348		

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (100 Series Page 50)

(T) = 0.34 (X)	Directional Distribution:	22% ent.	78% exit.
(T) = 0.34 * (1024.5)	T = 348	Average Vehicle Trip Ends	
	77 entering	271	exiting
	77 + 271 = 348		

Weekday (100 Series Page 48)












Average Weekday	Directional Distribution:	50% ent.	50% exit.
(T) = 3.37 (X)	T = 3454	Average Vehicle Trip Ends	
(T) = 3.37 * (1024.5)	1727 entering	1727	exiting
	1727 + 1727 = 3454		

Building I Site Specific Trip Generation

Client Provided Data - Building I											
Employee Cars				Trucks				Cars + Trucks Average Weekday			
Time	In	Out	Total	Time	In	Out	Total		In	Out	Total
7:00	91	21	112	7:00	22	15	37	7:00	113	36	149
8:00	32	12	44	8:00	16	21	37	8:00	48	33	81
16:00	16	46	62	16:00	14	17	31	16:00	30	63	93
17:00	67	448	515	17:00	17	18	35	17:00	84	466	550
Total	1,416	1,416	2,832	Total	380	388	768	Total	1,796	1,804	3,600

Intersection Capacity Analysis Outputs











Intersection												
Intersection Delay, s/veh	8.3											
Intersection LOS	A											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	1	6	0	0	0	17	20	1	0	11	3
Future Vol, veh/h	10	1	6	0	0	0	17	20	1	0	11	3
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Heavy Vehicles, %	35	35	35	2	2	2	26	26	26	93	93	93
Mvmt Flow	12	1	7	0	0	0	21	24	1	0	13	4
Number of Lanes	1	1	1	1	2	0	1	1	1	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	8.1	0	8.1	8.9
HCM LOS	A	-	A	A

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	100%	100%	100%	100%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	17	20	1	10	1	6	0	0	0	0	7
LT Vol	17	0	0	10	0	0	0	0	0	0	0
Through Vol	0	20	0	0	1	0	0	0	0	0	7
RT Vol	0	0	1	0	0	6	0	0	0	0	0
Lane Flow Rate	21	24	1	12	1	7	0	0	0	0	9
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.032	0.034	0.001	0.019	0.002	0.009	0	0	0	0	0.015
Departure Headway (Hd)	5.505	5.005	4.305	5.708	5.208	4.508	4.679	4.679	2.944	6.183	6.183
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	649	713	828	622	681	785	0	0	0	0	577
Service Time	3.248	2.748	2.047	3.486	2.986	2.286	2.475	2.475	0.74	3.944	3.944
HCM Lane V/C Ratio	0.032	0.034	0.001	0.019	0.001	0.009	0	0	0	0	0.016
HCM Control Delay	8.4	7.9	7.1	8.6	8	7.3	7.5	7.5	5.7	8.9	9
HCM Lane LOS	A	A	A	A	A	A	N	N	N	N	A
HCM 95th-tile Q	0.1	0.1	0	0.1	0	0	0	0	0	0	0

Intersection												
Intersection Delay, s/veh	7.5											
Intersection LOS	A											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	2	18	0	2	0	3	6	0	0	20	13
Future Vol, veh/h	6	2	18	0	2	0	3	6	0	0	20	13
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Heavy Vehicles, %	19	19	19	50	50	50	78	78	78	3	3	3
Mvmt Flow	8	3	25	0	3	0	4	8	0	0	27	18
Number of Lanes	1	1	1	1	2	0	1	1	1	1	2	0











Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	7.4	7	9	7.3
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%
Vol Thru, %	0%	100%	100%	0%	100%	0%	100%	100%	100%	100%	100%
Vol Right, %	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	6	0	6	2	18	0	1	1	0	13
LT Vol	3	0	0	6	0	0	0	0	0	0	0
Through Vol	0	6	0	0	2	0	0	1	1	0	13
RT Vol	0	0	0	0	0	18	0	0	0	0	0
Lane Flow Rate	4	8	0	8	3	25	0	1	1	0	18
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.007	0.014	0	0.012	0.004	0.029	0	0.002	0.001	0	0.024
Departure Headway (Hd)	6.455	5.955	5.955	5.434	4.934	4.234	5.506	5.506	2.954	4.636	4.636
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	553	599	0	656	722	840	0	645	1189	0	769
Service Time	4.208	3.708	3.708	3.188	2.688	1.987	3.28	3.28	0.727	2.381	2.381
HCM Lane V/C Ratio	0.007	0.013	0	0.012	0.004	0.03	0	0.002	0.001	0	0.023
HCM Control Delay	9.3	8.8	8.7	8.3	7.7	7.1	8.3	8.3	5.7	7.4	7.5
HCM Lane LOS	A	A	N	A	A	A	N	A	A	N	A
HCM 95th-tile Q	0	0	0	0	0	0.1	0	0	0	0	0.1

HCM 6th AWSC
2: Powhaton Road & 64th Avenue

2025 Total AM
05/15/2024

Intersection												
Intersection Delay, s/veh	9.6											
Intersection LOS	A											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	75	128	111	10	47	0	39	35	1	0	21	23
Future Vol, veh/h	75	128	111	10	47	0	39	35	1	0	21	23
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	35	35	35	2	2	2	26	26	26	93	93	93
Mvmt Flow	88	151	131	12	55	0	46	41	1	0	25	27
Number of Lanes	1	1	1	1	2	0	1	1	1	1	2	0











Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	9.8	8.1	9.8	10.3
HCM LOS	A	A	A	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%	0%	100%	100%	100%	100%
Vol Right, %	0%	0%	100%	0%	0%	100%	0%	0%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	39	35	1	75	128	111	10	24	24	0	14
LT Vol	39	0	0	75	0	0	10	0	0	0	0
Through Vol	0	35	0	0	128	0	0	24	24	0	14
RT Vol	0	0	1	0	0	111	0	0	0	0	0
Lane Flow Rate	46	41	1	88	151	131	12	28	28	0	16
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.085	0.071	0.002	0.152	0.239	0.182	0.02	0.044	0.031	0	0.034
Departure Headway (Hd)	6.708	6.209	5.51	6.214	5.713	5.011	6.27	5.768	4.028	7.421	7.421
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	532	574	646	576	628	714	568	617	879	0	481
Service Time	4.475	3.975	3.276	3.96	3.459	2.757	4.037	3.535	1.795	5.192	5.192
HCM Lane V/C Ratio	0.086	0.071	0.002	0.153	0.24	0.183	0.021	0.045	0.032	0	0.033
HCM Control Delay	10.1	9.5	8.3	10.1	10.3	8.9	9.2	8.8	6.9	10.2	10.5
HCM Lane LOS	B	A	A	B	B	A	A	A	A	N	B
HCM 95th-tile Q	0.3	0.2	0	0.5	0.9	0.7	0.1	0.1	0.1	0	0.1

HCM 6th AWSC
2: Powhatan Road & 64th Avenue

2025 Total PM
05/15/2024

Intersection	
Intersection Delay, s/veh	11.6
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	76	57	54	282	0	129	11	0	0	40	73
Future Vol, veh/h	31	76	57	54	282	0	129	11	0	0	40	73
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	19	19	19	50	50	50	78	78	78	3	3	3
Mvmt Flow	36	89	67	64	332	0	152	13	0	0	47	86
Number of Lanes	1	1	1	1	2	0	1	1	1	1	2	0





















Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	3	3
HCM Control Delay	10.6	11	15.3	10.3
HCM LOS	B	B	C	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	0%	100%	0%	0%	0%	0%
Vol Thru, %	0%	100%	100%	0%	100%	0%	0%	100%	100%	100%	100%
Vol Right, %	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	129	11	0	31	76	57	54	141	141	0	27
LT Vol	129	0	0	31	0	0	54	0	0	0	0
Through Vol	0	11	0	0	76	0	0	141	141	0	27
RT Vol	0	0	0	0	0	57	0	0	0	0	0
Lane Flow Rate	152	13	0	36	89	67	64	166	166	0	31
Geometry Grp	8	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.354	0.028	0	0.076	0.173	0.116	0.134	0.327	0.208	0	0.06
Departure Headway (Hd)	8.397	7.896	7.896	7.464	6.956	6.246	7.605	7.099	4.516	6.849	6.849
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	428	453	0	479	514	572	471	506	790	0	521
Service Time	6.16	5.659	5.659	5.227	4.719	4.008	5.359	4.853	2.269	4.616	4.616
HCM Lane V/C Ratio	0.355	0.029	0	0.075	0.173	0.117	0.136	0.328	0.21	0	0.06
HCM Control Delay	15.7	10.9	10.7	10.8	11.2	9.8	11.5	13.3	8.5	9.6	10.1
HCM Lane LOS	C	B	N	B	B	A	B	B	A	N	B
HCM 95th-tile Q	1.6	0.1	0	0.2	0.6	0.4	0.5	1.4	0.8	0	0.2

Timings 2: Powhatan Road & 64th Avenue

2040 Total AM

05/15/2024

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	200	106	570	80	66	452	275	65	55	200
Future Volume (vph)	200	106	570	80	66	452	275	65	55	200
Turn Type	pm+pt	NA	Free	pm+pt	NA	Prot	NA	Perm	Perm	NA
Protected Phases	7	4		3	8	5	2			6
Permitted Phases	4		Free	8				2	6	
Detector Phase	7	4		3	8	5	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5	9.5	22.5	22.5	22.5	22.5
Total Split (s)	26.0	36.0		14.0	24.0	38.0	70.0	70.0	32.0	32.0
Total Split (%)	21.7%	30.0%		11.7%	20.0%	31.7%	58.3%	58.3%	26.7%	26.7%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag	Lead			Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes	Yes
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120

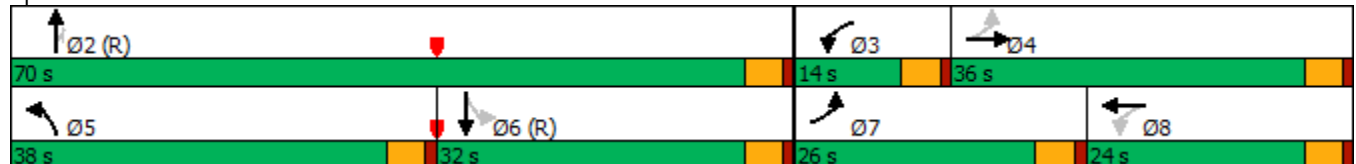
Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 2: Powhatan Road & 64th Avenue


























HCM 6th Signalized Intersection Summary

2: Powhatan Road & 64th Avenue

2040 Total AM





















05/15/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	106	570	80	66	40	452	275	65	55	200	125
Future Volume (veh/h)	200	106	570	80	66	40	452	275	65	55	200	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	217	115	0	87	72	43	491	299	71	60	217	136
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	313	232		231	118	65	573	1215	1030	514	958	575
Arrive On Green	0.14	0.13	0.00	0.06	0.06	0.06	0.18	0.69	0.69	0.48	0.48	0.48
Sat Flow, veh/h	1668	1752	1485	1668	2067	1143	3237	1752	1485	948	1999	1201
Grp Volume(v), veh/h	217	115	0	87	57	58	491	299	71	60	179	174
Grp Sat Flow(s),veh/h/ln	1668	1752	1485	1668	1664	1546	1618	1752	1485	948	1664	1536
Q Serve(g_s), s	14.2	7.3	0.0	5.8	4.0	4.4	17.7	7.6	1.8	4.2	7.5	8.0
Cycle Q Clear(g_c), s	14.2	7.3	0.0	5.8	4.0	4.4	17.7	7.6	1.8	4.2	7.5	8.0
Prop In Lane	1.00		1.00	1.00		0.74	1.00		1.00	1.00		0.78
Lane Grp Cap(c), veh/h	313	232		231	95	88	573	1215	1030	514	797	736
V/C Ratio(X)	0.69	0.50		0.38	0.60	0.66	0.86	0.25	0.07	0.12	0.22	0.24
Avail Cap(c_a), veh/h	383	460		260	270	251	904	1215	1030	514	797	736
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.2	48.4	0.0	49.2	55.2	55.4	47.9	6.8	5.9	17.4	18.2	18.4
Incr Delay (d2), s/veh	4.1	1.6	0.0	1.0	5.9	8.1	5.0	0.5	0.1	0.5	0.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	3.3	0.0	2.5	1.8	1.9	7.5	2.8	0.6	1.0	3.0	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.3	50.0	0.0	50.2	61.2	63.6	52.9	7.3	6.0	17.8	18.9	19.1
LnGrp LOS	D	D		D	E	E	D	A	A	B	B	B
Approach Vol, veh/h		332			202			861			413	
Approach Delay, s/veh		48.2			57.1			33.2			18.8	
Approach LOS		D			E			C			B	
Timer - Assigned Phs		2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s		87.7	11.9	20.4	25.7	62.0	20.9	11.3				
Change Period (Y+Rc), s		4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s		65.5	9.5	31.5	33.5	27.5	21.5	19.5				
Max Q Clear Time (g_c+I1), s		9.6	7.8	9.3	19.7	10.0	16.2	6.4				
Green Ext Time (p_c), s		2.2	0.0	0.5	1.6	2.3	0.3	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			35.3									
HCM 6th LOS			D									
Notes												
Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.												

Timings 2: Powhatan Road & 64th Avenue

2040 Total PM

05/15/2024

										
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	125	87	591	139	248	595	220	55	50	250
Future Volume (vph)	125	87	591	139	248	595	220	55	50	250
Turn Type	pm+pt	NA	Free	pm+pt	NA	Prot	NA	Perm	Perm	NA
Protected Phases	7	4		3	8	5	2			6
Permitted Phases	4		Free	8				2	6	
Detector Phase	7	4		3	8	5	2	2	6	6
Switch Phase										
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	22.5		9.5	22.5	9.5	22.5	22.5	22.5	22.5
Total Split (s)	18.0	26.8		16.2	25.0	42.0	77.0	77.0	35.0	35.0
Total Split (%)	15.0%	22.3%		13.5%	20.8%	35.0%	64.2%	64.2%	29.2%	29.2%
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lead	Lag		Lead	Lag	Lead			Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes	Yes
Recall Mode	None	None		None	None	None	C-Max	C-Max	C-Max	C-Max

Intersection Summary

Cycle Length: 120

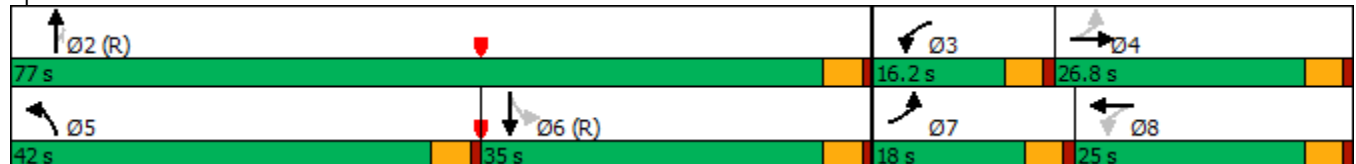
Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 75
























Control Type: Actuated-Coordinated

Splits and Phases: 2: Powhatan Road & 64th Avenue












HCM 6th Signalized Intersection Summary 2: Powhatan Road & 64th Avenue

2040 Total PM
05/15/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	125	87	591	139	248	50	595	220	55	50	250	225
Future Volume (veh/h)	125	87	591	139	248	50	595	220	55	50	250	225
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752	1752
Adj Flow Rate, veh/h	136	95	0	151	270	54	647	239	60	54	272	245
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	10	10	10	10	10	10	10	10	10	10	10	10
Cap, veh/h	231	200		295	337	66	735	1189	1007	479	697	607
Arrive On Green	0.09	0.11	0.00	0.09	0.12	0.12	0.23	0.68	0.68	0.41	0.41	0.41
Sat Flow, veh/h	1668	1752	1485	1668	2772	546	3237	1752	1485	1012	1684	1468
Grp Volume(v), veh/h	136	95	0	151	160	164	647	239	60	54	269	248
Grp Sat Flow(s),veh/h/ln	1668	1752	1485	1668	1664	1654	1618	1752	1485	1012	1664	1488
Q Serve(g_s), s	8.5	6.1	0.0	9.4	11.2	11.6	23.2	6.1	1.6	4.0	13.5	14.1
Cycle Q Clear(g_c), s	8.5	6.1	0.0	9.4	11.2	11.6	23.2	6.1	1.6	4.0	13.5	14.1
Prop In Lane	1.00		1.00	1.00		0.33	1.00		1.00	1.00		0.99
Lane Grp Cap(c), veh/h	231	200		295	202	201	735	1189	1007	479	689	616
V/C Ratio(X)	0.59	0.48		0.51	0.79	0.81	0.88	0.20	0.06	0.11	0.39	0.40
Avail Cap(c_a), veh/h	273	326		300	284	282	1011	1189	1007	479	689	616
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.2	49.8	0.0	41.5	51.2	51.4	44.8	7.2	6.5	21.8	24.6	24.7
Incr Delay (d2), s/veh	2.4	1.8	0.0	1.4	9.8	11.6	6.9	0.4	0.1	0.5	1.7	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	2.8	0.0	4.0	5.2	5.4	10.0	2.3	0.5	1.0	5.7	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.6	51.5	0.0	42.9	61.0	63.0	51.7	7.6	6.6	22.3	26.2	26.7
LnGrp LOS	D	D		D	E	E	D	A	A	C	C	C
Approach Vol, veh/h	231		475				946				571	
Approach Delay, s/veh	47.5		55.9				37.7				26.1	
Approach LOS	D		E				D				C	
Timer - Assigned Phs	2		3		4		5		6		7	
Phs Duration (G+Y+Rc), s	85.9		15.9		18.2		31.8		54.2		15.0	
Change Period (Y+Rc), s	4.5		4.5		4.5		4.5		4.5		4.5	
Max Green Setting (Gmax), s	72.5		11.7		22.3		37.5		30.5		13.5	
Max Q Clear Time (g_c+I1), s	8.1		11.4		8.1		25.2		16.1		10.5	
Green Ext Time (p_c), s	1.8		0.0		0.3		2.1		3.1		0.1	
Intersection Summary												
HCM 6th Ctrl Delay	39.6											
HCM 6th LOS	D											
Notes												









HCM 6th TWSC
5: Powhaton Road & Bldg I Full Access

2025 Total AM
06/12/2024

Intersection												
Int Delay, s/veh	0.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	8	0	2	0	58	46	9	123	0
Future Vol, veh/h	0	0	0	8	0	2	0	58	46	9	123	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	150	-	150	150	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	81	81	81	81	81	81	81	81	81	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2	24	24	24	82	82	82
Mvmt Flow	0	0	0	10	0	2	0	72	57	11	152	0
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	210	303	76	170	246	36	152	0	0	129	0	0
Stage 1	174	174	-	72	72	-	-	-	-	-	-	-
Stage 2	36	129	-	98	174	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.58	-	-	5.74	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.44	-	-	3.02	-	-
Pot Cap-1 Maneuver	729	609	970	778	655	1029	1280	-	-	1024	-	-
Stage 1	811	754	-	929	834	-	-	-	-	-	-	-
Stage 2	975	788	-	898	754	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	721	602	970	772	648	1029	1280	-	-	1024	-	-
Mov Cap-2 Maneuver	718	622	-	766	650	-	-	-	-	-	-	-
Stage 1	811	746	-	929	834	-	-	-	-	-	-	-
Stage 2	973	788	-	888	746	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	0		9.5		0		0.6					
HCM LOS	A		A									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR					
Capacity (veh/h)	1280	-	-	-	766	1029	1024	-	-			
HCM Lane V/C Ratio	-	-	-	-	0.013	0.002	0.011	-	-			
HCM Control Delay (s)	0	-	-	0	9.8	8.5	8.6	-	-			
HCM Lane LOS	A	-	-	A	A	A	A	-	-			
HCM 95th %tile Q(veh)	0	-	-	-	0	0	0	-	-			

HCM 6th TWSC
5: Powhatan Road & Bldg I Full Access

2025 Total PM
06/12/2024

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	179	0	45	0	90	34	7	125	0
Future Vol, veh/h	0	0	0	179	0	45	0	90	34	7	125	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	150	-	150	150	-	-
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	78	78	78	78	78	78	78	78	78
Heavy Vehicles, %	2	2	2	2	2	2	78	78	78	2	2	2
Mvmt Flow	0	0	0	229	0	58	0	115	44	9	160	0
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	236	337	80	213	293	58	160	0	0	159	0	0
Stage 1	178	178	-	115	115	-	-	-	-	-	-	-
Stage 2	58	159	-	98	178	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	5.66	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.98	-	-	2.22	-	-
Pot Cap-1 Maneuver	699	583	964	725	617	996	1003	-	-	1418	-	-
Stage 1	806	751	-	877	799	-	-	-	-	-	-	-
Stage 2	947	765	-	898	751	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	656	580	964	721	613	996	1003	-	-	1418	-	-
Mov Cap-2 Maneuver	735	659	-	787	679	-	-	-	-	-	-	-
Stage 1	806	746	-	877	799	-	-	-	-	-	-	-
Stage 2	892	765	-	892	746	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	0		10.9			0			0.4			
HCM LOS	A		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR					
Capacity (veh/h)	1003	-	-	-	787	996	1418	-	-			
HCM Lane V/C Ratio	-	-	-	-	0.292	0.058	0.006	-	-			
HCM Control Delay (s)	0	-	-	0	11.4	8.8	7.6	-	-			
HCM Lane LOS	A	-	-	A	B	A	A	-	-			
HCM 95th %tile Q(veh)	0	-	-	-	1.2	0.2	0	-	-			

HCM 6th TWSC
5: Powhatan Road & Bldg I Full Access

2040 Total AM
06/12/2024

Intersection												
Int Delay, s/veh	0.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕↕	↕	↕	↕↕	
Traffic Vol, veh/h	0	0	0	8	0	2	0	790	46	9	841	0
Future Vol, veh/h	0	0	0	8	0	2	0	790	46	9	841	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	150	-	150	150	-	-
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	0	0	0	9	0	2	0	859	50	10	914	0

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	1364	1843	457	1336	1793	430	914	0	0	909	0	0
Stage 1	934	934	-	859	859	-	-	-	-	-	-	-
Stage 2	430	909	-	477	934	-	-	-	-	-	-	-
Critical Hdwy	7.7	6.7	7.1	7.7	6.7	7.1	4.3	-	-	4.3	-	-
Critical Hdwy Stg 1	6.7	5.7	-	6.7	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.7	-	6.7	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	3.6	4.1	3.4	3.6	4.1	3.4	2.3	-	-	2.3	-	-
Pot Cap-1 Maneuver	*252	*102	*719	*271	*113	552	*1064	-	-	697	-	-
Stage 1	*680	*597	-	*301	*353	-	-	-	-	-	-	-
Stage 2	*553	*334	-	*680	*597	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	*249	*101	*719	*268	*111	552	*1064	-	-	697	-	-
Mov Cap-2 Maneuver	*454	*281	-	*285	*302	-	-	-	-	-	-	-
Stage 1	*680	*588	-	*301	*353	-	-	-	-	-	-	-
Stage 2	*551	*334	-	*670	*588	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	16.7	0	0.1
HCM LOS	A	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR
Capacity (veh/h)	* 1064	-	-	- 285 552	697	-	-
HCM Lane V/C Ratio	-	-	-	0.031 0.004 0.014	-	-	-
HCM Control Delay (s)	0	-	-	0 18 11.5	10.2	-	-
HCM Lane LOS	A	-	-	A C B	B	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1 0 0	0	-	-

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

HCM 6th TWSC
5: Powhatan Road & Bldg I Full Access

2040 Total PM
06/12/2024

Intersection												
Int Delay, s/veh	4.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↕	↕		↕	↕	↕	↕	↕	
Traffic Vol, veh/h	0	0	0	179	0	45	0	825	34	7	973	0
Future Vol, veh/h	0	0	0	179	0	45	0	825	34	7	973	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	0	-	-	150	-	150	150	-	-
Veh in Median Storage, #	-	2	-	-	2	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	10	10	10	10	10	10	10	10	10
Mvmt Flow	0	0	0	195	0	49	0	897	37	8	1058	0

Major/Minor	Minor2		Minor1		Major1		Major2		Major2		Major2	
Conflicting Flow All	1523	2008	529	1442	1971	449	1058	0	0	934	0	0
Stage 1	1074	1074	-	897	897	-	-	-	-	-	-	-
Stage 2	449	934	-	545	1074	-	-	-	-	-	-	-
Critical Hdwy	7.7	6.7	7.1	7.7	6.7	7.1	4.3	-	-	4.3	-	-
Critical Hdwy Stg 1	6.7	5.7	-	6.7	5.7	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.7	5.7	-	6.7	5.7	-	-	-	-	-	-	-
Follow-up Hdwy	3.6	4.1	3.4	3.6	4.1	3.4	2.3	-	-	2.3	-	-
Pot Cap-1 Maneuver	*209	*78	*668	*260	*85	536	*989	-	-	681	-	-
Stage 1	*632	*554	-	*285	*339	-	-	-	-	-	-	-
Stage 2	*538	*325	-	*632	*554	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	-	-	-	-	-	-
Mov Cap-1 Maneuver	*189	*77	*668	*258	*84	536	*989	-	-	681	-	-
Mov Cap-2 Maneuver	*399	*267	-	*270	*282	-	-	-	-	-	-	-
Stage 1	*632	*548	-	*285	*339	-	-	-	-	-	-	-
Stage 2	*489	*325	-	*624	*548	-	-	-	-	-	-	-






Approach	EB	WB	NB	SB
HCM Control Delay, s	0	39.6	0	0.1
HCM LOS	A	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1WBLn2	SBL	SBT	SBR
Capacity (veh/h)	* 989	-	-	- 270 536	681	-	-
HCM Lane V/C Ratio	-	-	-	0.721 0.091 0.011	-	-	-
HCM Control Delay (s)	0	-	-	0 46.4 12.4 10.3	-	-	-
HCM Lane LOS	A	-	-	A E B B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	- 5 0.3 0	-	-	-

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






HCM 6th TWSC
6: Powhaton Road & Bldg I& II Inbound Only

2025 Total AM
06/12/2024

Intersection						
Int Delay, s/veh	2.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	104	39	67	61
Future Vol, veh/h	0	0	104	39	67	61
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	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	12	60	60	12
Mvmt Flow	0	0	113	42	73	66
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	292	57	0	0	155	0
Stage 1	113	-	-	-	-	-
Stage 2	179	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	5.3	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.8	-
Pot Cap-1 Maneuver	675	997	-	-	1086	-
Stage 1	899	-	-	-	-	-
Stage 2	834	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	630	997	-	-	1086	-
Mov Cap-2 Maneuver	662	-	-	-	-	-
Stage 1	899	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	0	0		4.5		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	-	1086	-	
HCM Lane V/C Ratio	-	-	-	0.067	-	
HCM Control Delay (s)	-	-	0	8.6	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	-	0.2	-	







HCM 6th TWSC
6: Powhaton Road & Bldg I& II Inbound Only

2025 Total PM
06/12/2024

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	124	17	24	279
Future Vol, veh/h	0	0	124	17	24	279
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	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	12	60	60	12
Mvmt Flow	0	0	135	18	26	303
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	339	68	0	0	153	0
Stage 1	135	-	-	-	-	-
Stage 2	204	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	5.3	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.8	-
Pot Cap-1 Maneuver	631	981	-	-	1089	-
Stage 1	877	-	-	-	-	-
Stage 2	810	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	616	981	-	-	1089	-
Mov Cap-2 Maneuver	658	-	-	-	-	-
Stage 1	877	-	-	-	-	-
Stage 2	791	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	0	0		0.7		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	-	1089	-	
HCM Lane V/C Ratio	-	-	-	0.024	-	
HCM Control Delay (s)	-	-	0	8.4	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	-	0.1	-	







HCM 6th TWSC
6: Powhaton Road & Bldg I & II Inbound Only




2040 Total AM
06/12/2024




Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	836	39	67	783
Future Vol, veh/h	0	0	836	39	67	783
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	0	-	150	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	10	60	60	10
Mvmt Flow	0	0	909	42	73	851
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1481	455	0	0	951	0
Stage 1	909	-	-	-	-	-
Stage 2	572	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	5.3	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.8	-
Pot Cap-1 Maneuver	*213	552	-	-	449	-
Stage 1	*353	-	-	-	-	-
Stage 2	*720	-	-	-	-	-
Platoon blocked, %	1	-	-	-	-	-
Mov Cap-1 Maneuver	*178	552	-	-	449	-
Mov Cap-2 Maneuver	*276	-	-	-	-	-
Stage 1	*353	-	-	-	-	-
Stage 2	*603	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	0	0		1.1		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	-	-	449	-
HCM Lane V/C Ratio	-	-	-	-	0.162	-
HCM Control Delay (s)	-	-	0	0	14.6	-
HCM Lane LOS	-	-	A	A	B	-
HCM 95th %tile Q(veh)	-	-	-	-	0.6	-
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

HCM 6th TWSC
6: Powhaton Road & Bldg I & II Inbound Only

2040 Total PM
06/12/2024

Intersection						
Int Delay, s/veh	0.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	859	17	24	1128
Future Vol, veh/h	0	0	859	17	24	1128
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	0	-	150	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	10	2	2	10
Mvmt Flow	0	0	934	18	26	1226
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1599	467	0	0	952	0
Stage 1	934	-	-	-	-	-
Stage 2	665	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	*281	542	-	-	717	-
Stage 1	*343	-	-	-	-	-
Stage 2	*572	-	-	-	-	-
Platoon blocked, %	1	-	-	-	-	-
Mov Cap-1 Maneuver	*270	542	-	-	717	-
Mov Cap-2 Maneuver	*299	-	-	-	-	-
Stage 1	*343	-	-	-	-	-
Stage 2	*552	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	0	0	0.2			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1WBLn2	SBL	SBT		
Capacity (veh/h)	-	-	-	717	-	
HCM Lane V/C Ratio	-	-	-	0.036	-	
HCM Control Delay (s)	-	-	0	0	10.2	-
HCM Lane LOS	-	-	A	A	B	-
HCM 95th %tile Q(veh)	-	-	-	-	0.1	-
Notes						
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

Intersection						
Int Delay, s/veh	0.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	93	36	0	46	11	0
Future Vol, veh/h	93	36	0	46	11	0
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, %	12	2	2	12	2	2
Mvmt Flow	101	39	0	50	12	0
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	140	0	171	121
Stage 1	-	-	-	-	121	-
Stage 2	-	-	-	-	50	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1443	-	819	930
Stage 1	-	-	-	-	904	-
Stage 2	-	-	-	-	972	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1443	-	819	930
Mov Cap-2 Maneuver	-	-	-	-	819	-
Stage 1	-	-	-	-	904	-
Stage 2	-	-	-	-	972	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		9.5	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	819	-	-	1443	-	
HCM Lane V/C Ratio	0.015	-	-	-	-	
HCM Control Delay (s)	9.5	-	-	0	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0	-	-	0	-	

Intersection						
Int Delay, s/veh	6.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	49	27	0	112	224	0
Future Vol, veh/h	49	27	0	112	224	0
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, %	12	2	2	12	2	2
Mvmt Flow	53	29	0	122	243	0
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	82	0	190	68
Stage 1	-	-	-	-	68	-
Stage 2	-	-	-	-	122	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1515	-	799	995
Stage 1	-	-	-	-	955	-
Stage 2	-	-	-	-	903	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1515	-	799	995
Mov Cap-2 Maneuver	-	-	-	-	799	-
Stage 1	-	-	-	-	955	-
Stage 2	-	-	-	-	903	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		11.5	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	799	-	-	1515	-	
HCM Lane V/C Ratio	0.305	-	-	-	-	
HCM Control Delay (s)	11.5	-	-	0	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	1.3	-	-	0	-	

HCM 6th TWSC
7: West Access & 64th Avenue





2040 Total AM
06/12/2024





Intersection						
Int Delay, s/veh	0.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑↱		↱	↑↑	↱	
Traffic Vol, veh/h	190	36	0	175	11	0
Future Vol, veh/h	190	36	0	175	11	0
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	2	2	10	2	2
Mvmt Flow	207	39	0	190	12	0
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	246	0	322	123
Stage 1	-	-	-	-	227	-
Stage 2	-	-	-	-	95	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1426	-	764	*1023
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	918	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1426	-	764	*1023
Mov Cap-2 Maneuver	-	-	-	-	815	-
Stage 1	-	-	-	-	897	-
Stage 2	-	-	-	-	918	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		9.5	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	815	-	-	1426	-	
HCM Lane V/C Ratio	0.015	-	-	-	-	
HCM Control Delay (s)	9.5	-	-	0	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	0	-	-	0	-	
Notes						
~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon						

HCM 6th TWSC
7: West Access & 64th Avenue

2040 Total PM
06/12/2024

Intersection						
Int Delay, s/veh	4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↓	↑↑	↓	
Traffic Vol, veh/h	165	27	0	213	224	0
Future Vol, veh/h	165	27	0	213	224	0
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	2	2	10	2	2
Mvmt Flow	179	29	0	232	243	0
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	208	0	310	104
Stage 1	-	-	-	-	194	-
Stage 2	-	-	-	-	116	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	1475	-	778	*1023
Stage 1	-	-	-	-	934	-
Stage 2	-	-	-	-	896	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1475	-	778	*1023
Mov Cap-2 Maneuver	-	-	-	-	823	-
Stage 1	-	-	-	-	934	-
Stage 2	-	-	-	-	896	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		11.2	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	823	-	-	1475	-	
HCM Lane V/C Ratio	0.296	-	-	-	-	
HCM Control Delay (s)	11.2	-	-	0	-	
HCM Lane LOS	B	-	-	A	-	
HCM 95th %tile Q(veh)	1.2	-	-	0	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Intersection								
Int Delay, s/veh	2							
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations								
Traffic Vol, veh/h	37	56	0	18	28	0		
Future Vol, veh/h	37	56	0	18	28	0		
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	0		
Veh in Median Storage, #	0	-	-	0	0	-		
Grade, %	0	-	-	0	0	-		
Peak Hour Factor	92	92	92	92	92	92		
Heavy Vehicles, %	12	20	20	12	60	60		
Mvmt Flow	40	61	0	20	30	0		
Major/Minor	Major1		Major2		Minor1			
Conflicting Flow All	0	0	101	0	91	71		
Stage 1	-	-	-	-	71	-		
Stage 2	-	-	-	-	20	-		
Critical Hdwy	-	-	4.3	-	7	6.8		
Critical Hdwy Stg 1	-	-	-	-	6	-		
Critical Hdwy Stg 2	-	-	-	-	6	-		
Follow-up Hdwy	-	-	2.38	-	4.04	3.84		
Pot Cap-1 Maneuver	-	-	1386	-	785	851		
Stage 1	-	-	-	-	824	-		
Stage 2	-	-	-	-	872	-		
Platoon blocked, %	-	-		-				
Mov Cap-1 Maneuver	-	-	1386	-	785	851		
Mov Cap-2 Maneuver	-	-	-	-	785	-		
Stage 1	-	-	-	-	824	-		
Stage 2	-	-	-	-	872	-		
Approach	EB		WB		NB			
HCM Control Delay, s	0		0		9.8			
HCM LOS					A			
Minor Lane/Major Mvmt	NBLn1		NBLn2		EBT	EBR	WBL	WBT
Capacity (veh/h)	785		-		-	-	1386	-
HCM Lane V/C Ratio	0.039		-		-	-	-	-
HCM Control Delay (s)	9.8		0		-	-	0	-
HCM Lane LOS	A		A		-	-	A	-
HCM 95th %tile Q(veh)	0.1		-		-	-	0	-

Intersection						
Int Delay, s/veh	4.5					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	34	15	0	40	72	0
Future Vol, veh/h	34	15	0	40	72	0
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	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	12	20	20	12	60	60
Mvmt Flow	37	16	0	43	78	0
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	53	0	88	45
Stage 1	-	-	-	-	45	-
Stage 2	-	-	-	-	43	-
Critical Hdwy	-	-	4.3	-	7	6.8
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	-	-	2.38	-	4.04	3.84
Pot Cap-1 Maneuver	-	-	1445	-	789	882
Stage 1	-	-	-	-	848	-
Stage 2	-	-	-	-	850	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1445	-	789	882
Mov Cap-2 Maneuver	-	-	-	-	789	-
Stage 1	-	-	-	-	848	-
Stage 2	-	-	-	-	850	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		10.1		
HCM LOS	B					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	789	-	-	-	1445	-
HCM Lane V/C Ratio	0.099	-	-	-	-	-
HCM Control Delay (s)	10.1	0	-	-	0	-
HCM Lane LOS	B	A	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	-	0	-

Intersection						
Int Delay, s/veh	0.8					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Vol, veh/h	134	56	0	147	28	0
Future Vol, veh/h	134	56	0	147	28	0
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	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	20	20	10	60	60
Mvmt Flow	146	61	0	160	30	0
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	207	0	257	104
Stage 1	-	-	-	-	177	-
Stage 2	-	-	-	-	80	-
Critical Hdwy	-	-	4.5	-	8	8.1
Critical Hdwy Stg 1	-	-	-	-	7	-
Critical Hdwy Stg 2	-	-	-	-	7	-
Follow-up Hdwy	-	-	2.4	-	4.1	3.9
Pot Cap-1 Maneuver	-	-	1240	-	572	772
Stage 1	-	-	-	-	687	-
Stage 2	-	-	-	-	786	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1240	-	572	772
Mov Cap-2 Maneuver	-	-	-	-	635	-
Stage 1	-	-	-	-	687	-
Stage 2	-	-	-	-	786	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		11	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	635		-	-	-	1240
HCM Lane V/C Ratio	0.048		-	-	-	-
HCM Control Delay (s)	11		0	-	-	0
HCM Lane LOS	B		A	-	-	A
HCM 95th %tile Q(veh)	0.2		-	-	-	0

Intersection						
Int Delay, s/veh	2.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↱	↑↑	↱	↱
Traffic Vol, veh/h	150	15	0	141	72	0
Future Vol, veh/h	150	15	0	141	72	0
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	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	20	20	10	60	60
Mvmt Flow	163	16	0	153	78	0
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	179	0	248	90
Stage 1	-	-	-	-	171	-
Stage 2	-	-	-	-	77	-
Critical Hdwy	-	-	4.5	-	8	8.1
Critical Hdwy Stg 1	-	-	-	-	7	-
Critical Hdwy Stg 2	-	-	-	-	7	-
Follow-up Hdwy	-	-	2.4	-	4.1	3.9
Pot Cap-1 Maneuver	-	-	1272	-	581	791
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	790	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1272	-	581	791
Mov Cap-2 Maneuver	-	-	-	-	641	-
Stage 1	-	-	-	-	693	-
Stage 2	-	-	-	-	790	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		11.4	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	641		-	-	-	1272
HCM Lane V/C Ratio	0.122		-	-	-	-
HCM Control Delay (s)	11.4		0	-	-	0
HCM Lane LOS	B		A	-	-	A
HCM 95th %tile Q(veh)	0.4		-	-	-	0

HCM 6th TWSC
10: Powhaton Road & Bldg II Full Access

2025 Total AM
06/11/2024






Intersection						
Int Delay, s/veh	2.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔↔		↑↑	↑	↔	↑↑
Traffic Vol, veh/h	33	20	123	113	25	36
Future Vol, veh/h	33	20	123	113	25	36
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	-	-	0	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	12	12	12	12	12	12
Mvmt Flow	36	22	134	123	27	39
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	208	67	0	0	257	0
Stage 1	134	-	-	-	-	-
Stage 2	74	-	-	-	-	-
Critical Hdwy	7.04	7.14	-	-	4.34	-
Critical Hdwy Stg 1	6.04	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.62	3.42	-	-	2.32	-
Pot Cap-1 Maneuver	734	951	-	-	1235	-
Stage 1	849	-	-	-	-	-
Stage 2	911	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	718	951	-	-	1235	-
Mov Cap-2 Maneuver	723	-	-	-	-	-
Stage 1	849	-	-	-	-	-
Stage 2	891	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	9.9	0		3.3		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	795	1235	-	
HCM Lane V/C Ratio	-	-	0.072	0.022	-	
HCM Control Delay (s)	-	-	9.9	8	-	
HCM Lane LOS	-	-	A	A	-	
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-	

HCM 6th TWSC
10: Powhaton Road & Bldg II Full Access

2025 Total PM
06/12/2024

Intersection

Int Delay, s/veh 4.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	136	81	60	31	7	272
Future Vol, veh/h	136	81	60	31	7	272
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	-	-	0	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	12	12	12	20	20	12
Mvmt Flow	148	88	65	34	8	296






Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	229	33	0
Stage 1	65	-	-
Stage 2	164	-	-
Critical Hdwy	7.04	7.14	-
Critical Hdwy Stg 1	6.04	-	-
Critical Hdwy Stg 2	6.04	-	-
Follow-up Hdwy	3.62	3.42	-
Pot Cap-1 Maneuver	711	1001	-
Stage 1	921	-	-
Stage 2	819	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	707	1001	-
Mov Cap-2 Maneuver	710	-	-
Stage 1	921	-	-
Stage 2	814	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.4	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	796	1370
HCM Lane V/C Ratio	-	-	0.296	0.006
HCM Control Delay (s)	-	-	11.4	7.6
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	1.2	0






HCM 6th TWSC
10: Powhaton Road & Bldg II Full Access

2040 Total AM
06/12/2024

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	33	20	855	113	25	758
Future Vol, veh/h	33	20	855	113	25	758
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	150	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	20	20	10
Mvmt Flow	36	22	929	123	27	824
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1395	465	0	0	1052	0
Stage 1	929	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Critical Hdwy	7	7.1	-	-	4.5	-
Critical Hdwy Stg 1	6	-	-	-	-	-
Critical Hdwy Stg 2	6	-	-	-	-	-
Follow-up Hdwy	3.6	3.4	-	-	2.4	-
Pot Cap-1 Maneuver	*243	523	-	-	560	-
Stage 1	*326	-	-	-	-	-
Stage 2	*704	-	-	-	-	-
Platoon blocked, %	1		-	-		-
Mov Cap-1 Maneuver	*231	523	-	-	560	-
Mov Cap-2 Maneuver	*282	-	-	-	-	-
Stage 1	*326	-	-	-	-	-
Stage 2	*670	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	17.7	0		0.4		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	341	560	-	
HCM Lane V/C Ratio	-	-	0.169	0.049	-	
HCM Control Delay (s)	-	-	17.7	11.8	-	
HCM Lane LOS	-	-	C	B	-	
HCM 95th %tile Q(veh)	-	-	0.6	0.2	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

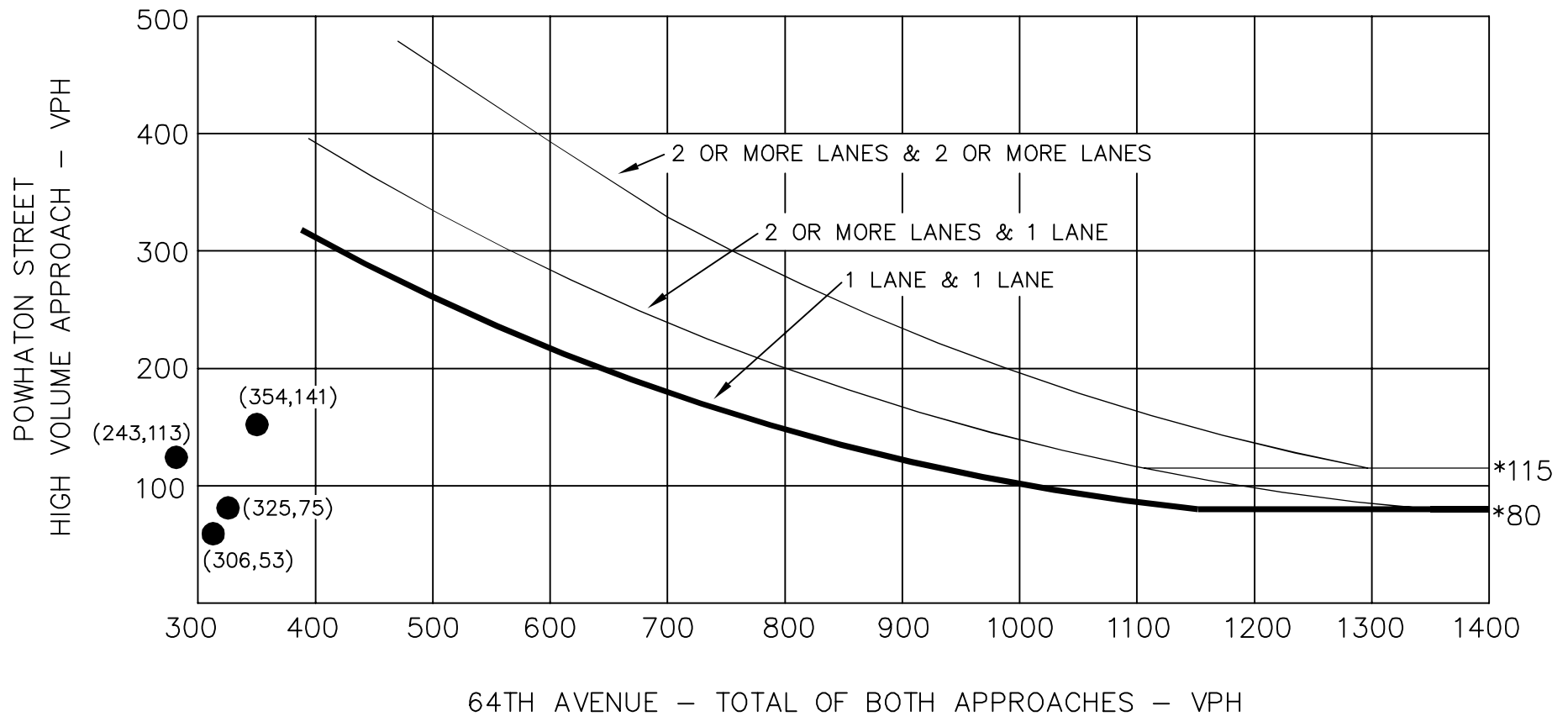
HCM 6th TWSC
10: Powhaton Road & Bldg II Full Access

2040 Total PM
06/12/2024

Intersection						
Int Delay, s/veh	2.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	136	81	795	31	7	1121
Future Vol, veh/h	136	81	795	31	7	1121
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	150	-
Veh in Median Storage, #	1	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	10	10	10	20	20	10
Mvmt Flow	148	88	864	34	8	1218
Major/Minor	Minor1	Major1		Major2		
Conflicting Flow All	1489	432	0	0	898	0
Stage 1	864	-	-	-	-	-
Stage 2	625	-	-	-	-	-
Critical Hdwy	7	7.1	-	-	4.5	-
Critical Hdwy Stg 1	6	-	-	-	-	-
Critical Hdwy Stg 2	6	-	-	-	-	-
Follow-up Hdwy	3.6	3.4	-	-	2.4	-
Pot Cap-1 Maneuver	*361	550	-	-	649	-
Stage 1	*354	-	-	-	-	-
Stage 2	*559	-	-	-	-	-
Platoon blocked, %	1	-	-	-	-	-
Mov Cap-1 Maneuver	*356	550	-	-	649	-
Mov Cap-2 Maneuver	*323	-	-	-	-	-
Stage 1	*354	-	-	-	-	-
Stage 2	*553	-	-	-	-	-
Approach	WB	NB		SB		
HCM Control Delay, s	28.5	0		0.1		
HCM LOS	D					
Minor Lane/Major Mvmt	NBT	NBRWBLn1		SBL	SBT	
Capacity (veh/h)	-	-	382	649	-	
HCM Lane V/C Ratio	-	-	0.617	0.012	-	
HCM Control Delay (s)	-	-	28.5	10.6	-	
HCM Lane LOS	-	-	D	B	-	
HCM 95th %tile Q(veh)	-	-	4	0	-	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

Signal Warrant Analysis Worksheet

WARRANT 2 - FOUR HOUR VEHICULAR VOLUME



64TH AVE & POWHATON
SIGNAL WARRANT ANALYSIS
FOUR HOUR VOLUME WARRANT

* NOTE: 115 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACH WITH TWO OR MORE LANES AND 80 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

● 2025 TRAFFIC DATA POINT

Source: Manual of Uniform Traffic Control Devices 2009