

Traffic Impact Study

# QuikTrip 4274

Aurora, Colorado

Prepared for:

**QuikTrip Corporation**

**Kimley»Horn**

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

## QuikTrip 4274

Aurora, Colorado

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## TABLE OF CONTENTS

TABLE OF CONTENTS .....	i
LIST OF TABLES .....	ii
LIST OF FIGURES .....	ii
1.0 EXECUTIVE SUMMARY .....	1
2.0 INTRODUCTION .....	3
3.0 EXISTING AND FUTURE CONDITIONS .....	5
3.1 Existing Study Area .....	5
3.2 Existing Roadway Network .....	5
3.3 Existing Traffic Volumes .....	8
3.4 Unspecified Development Traffic Growth .....	8
4.0 PROJECT TRAFFIC CHARACTERISTICS .....	12
4.1 Trip Generation .....	12
4.2 Trip Distribution .....	13
4.3 Traffic Assignment and Total Traffic Volumes .....	13
5.0 TRAFFIC OPERATIONS ANALYSIS .....	21
5.1 Analysis Methodology .....	21
5.2 Key Intersection Operational Analysis .....	22
5.3 Turn Bay Length Analysis .....	27
5.4 Vehicle Queuing Analysis .....	28
5.5 Improvement Summary .....	28
6.0 CONCLUSIONS AND RECOMMENDATIONS .....	30

## APPENDICES

- Appendix A – Intersection Count Sheets
- Appendix B – Future Traffic Projections
- Appendix C – Trip Generation Worksheets
- Appendix D – Intersection Analysis Worksheets
- Appendix E – Queue Analysis Worksheets
- Appendix F – Conceptual Site Plan

## LIST OF TABLES

Table 1 – QuikTrip 4274 Traffic Generation .....	13
Table 2 – Level of Service Definitions .....	21
Table 3 – Smoky Hill Road & Chambers Road LOS Results .....	23
Table 4 – Project Access Level of Service Results.....	26
Table 5 – Turn Lane Queuing Analysis Results.....	28

## LIST OF FIGURES

Figure 1 – Vicinity Map.....	4
Figure 2 – Existing Geometry and Control.....	7
Figure 3 – 2023 Existing Traffic Volumes .....	9
Figure 4 – 2026 Background Traffic Volumes.....	10
Figure 5 – 2050 Background Traffic Volumes.....	11
Figure 6 – Non Pass-By Project Trip Distribution .....	14
Figure 7 – AM Pass-By Project Trip Distribution.....	15
Figure 8 – PM Pass-By Project Trip Distribution.....	16
Figure 9 – Non Pass-By Project Traffic Assignment .....	17
Figure 10 – Pass-By Project Traffic Assignment .....	18
Figure 11 – 2026 Total Traffic Volumes.....	19
Figure 12 – 2050 Total Traffic Volumes.....	20
Figure 13 – 2050 Recommended Geometry and Control .....	29



## 1.0 EXECUTIVE SUMMARY

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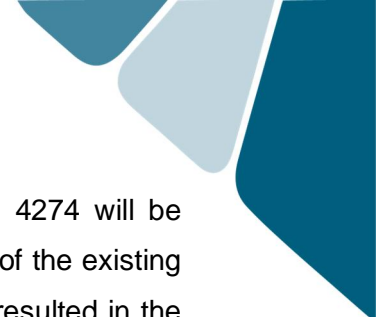
QuikTrip 4274 is proposed to be located on the northwest corner of Smoky Hill Road and Chambers Road intersection in Aurora, Colorado. The project is proposed to include a gas station with 14 fueling positions and a 5,312 square foot convenience store. It is expected that QuikTrip 4274 will be completed in the next several years. Therefore, analysis was conducted for the 2026 short-term buildout horizon as well as the 2050 long-term planning horizon.

The purpose of this traffic study is to identify project traffic generation characteristics to determine potential project traffic related impacts on the local street system and to develop the necessary mitigation measures required for the identified traffic impacts. The intersection of Smoky Hill Road and Chambers Road was incorporated into this traffic study in accordance with the City of Aurora scope.

In addition, the existing full movement access along Smoky Hill Road and the existing right-in/right-out access along Chambers Road were included in the evaluation.

Regional access to QuikTrip 4274 will be provided by Parker Road (SH-83) while primary access will be provided by Smoky Hill Road and Chambers Road. Direct access will be provided by the existing full movement intersection along Smoky Hill Road and the existing right-in/right-out access along Chambers Road.

QuikTrip 4274 is expected to generate approximately 3,600 daily weekday driveway trips, with 379 of these trips occurring during the morning peak hour and 319 trips occurring during the afternoon peak hour. Accounting for pass-by, expected net new (non pass-by) trips to the surrounding street network results in approximately 900 weekday daily trips, of which 91 trips and 80 trips are anticipated during the weekday morning and afternoon peak hours, respectively.



Based on the analysis presented in this report, Kimley-Horn believes QuikTrip 4274 will be successfully incorporated into the existing and future roadway network. Analysis of the existing street network, the proposed project development, and expected traffic volumes resulted in the following conclusions and recommendations:

- With redevelopment of the existing site to a gas station, the existing right-in only access along Chambers Road will be removed. Additionally, the existing full movement driveway along Smoky Hill Road will be narrowed from the existing 75-foot driveway to 35-feet. This reduced driveway width will result in less confusion for inbound and outbound drivers. The existing right-in/right-out access along Chambers Road will remain. An R1-1 “STOP” sign is recommended to be placed at both approaches exiting the site.
- For planning level purposes and if 2050 volumes are realized at the Smoky Hill Road / Chambers Road intersection, the eastbound left turn lane may need to be extended to 125 feet and the dual southbound left turn lanes to 225 feet. The taper for these longer dual southbound left turn lanes can be extended within the existing raised median. However, additional median work will be required to prohibit vehicles from exiting the Chamber Road access with a left turn maneuver.
- Any onsite or offsite improvements should be incorporated into the Civil Drawings and conform to standards of the City of Aurora and the Manual on Uniform Traffic Control Devices (MUTCD) – 2009 Edition.

## 2.0 INTRODUCTION

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Kimley-Horn has prepared this report to document the results of a Traffic Impact Study for QuikTrip 4274 proposed to replace an existing strip retail plaza located on the northwest corner of Smoky Hill Road and Chambers Road intersection in Aurora, Colorado. A vicinity map illustrating the QuikTrip 4274 development location is shown in **Figure 1**. QuikTrip 4274 is proposed to include a 5,312 square foot convenience store with 14 fueling positions. A conceptual site plan of the project is attached in **Appendix F**. It is expected that the project will be completed in the next few years; therefore, analysis was conducted for the 2026 short-term buildout horizon as well as the 2050 long-term planning horizon.

The purpose of this traffic study is to identify project traffic generation characteristics to determine potential project traffic related impacts on the local street system and to develop the necessary mitigation measures required for the identified traffic impacts. The intersection of Smoky Hill Road and Chambers Road was incorporated into this traffic study in accordance with the City of Aurora scope.

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Regional access to QuikTrip 4274 will be provided by Parker Road (SH-83) while primary access will be provided by Smoky Hill Road and Chambers Road. Direct access will be provided by the existing full movement intersection along Smoky Hill Road and the right-in/right-out access along Chambers Road.



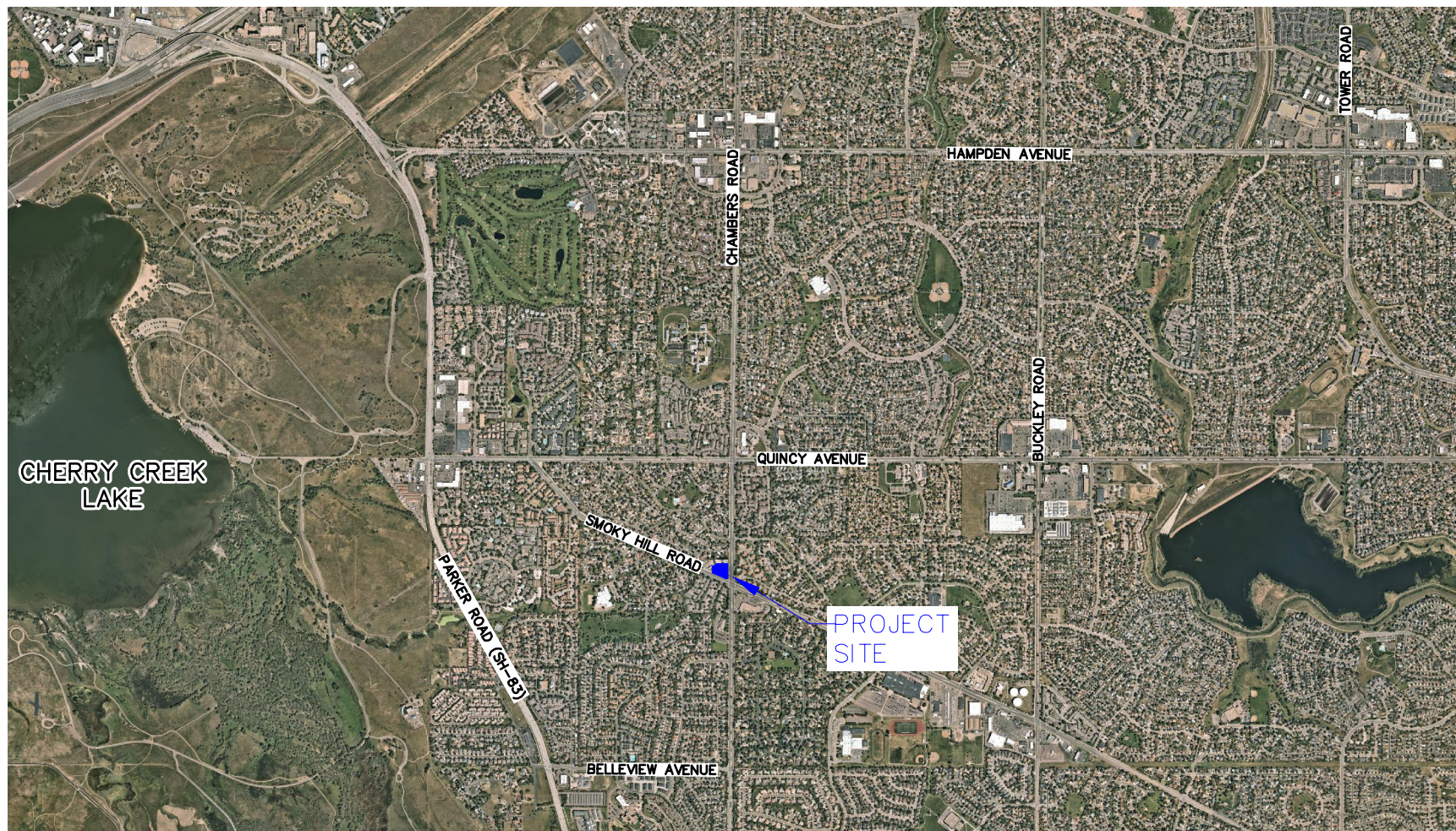


FIGURE 1  
QUIKTRIP 4274  
AURORA, COLORADO  
VICINITY MAP



## 3.0 EXISTING AND FUTURE CONDITIONS

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### 3.1 Existing Study Area

The existing site is a strip retail plaza with a car wash to the west and to the north of the site. Surrounding the area are residential homes and neighborhoods. On the southeast corner of the Smoky Hill Road and Chambers Road intersection is a strip retail plaza.

### 3.2 Existing Roadway Network

Smoky Hill Road primarily extends in east/west with three through lanes in each direction. The roadway runs diagonal from Quincy Avenue to E-470 as a northwest/southeast roadway. However, in this study the roadway will be the east/west roadway in the intersection analysis and figures. The posted speed limit along Smoky Hill near the project site is 40 miles per hour. This roadway is classified as an arterial roadway.

Chambers Road is a north-south roadway with three through lanes provided in each direction. The posted speed limit along Chambers Road is 45 miles per hour in each direction. Chambers Road extends from Parker Road (SH-83) to 56<sup>th</sup> Avenue as an arterial roadway.

The signalized intersection of Smoky Hill Road and Chambers Road operates with protected-permitted left turn phasing on all four approaches. The northbound Chambers Road approach and the eastbound/westbound Smoky Hill Road approaches each provide a left turn lane and three through lanes with the outside through lane being a shared through/right turn lane. The southbound approach of Chambers Road provides dual left turn lanes and three through lanes with a shared right on the outside through lane. An aerial photo of the existing intersection configuration is below (north is up – typical).



*Smoky Hill Road & Chambers Road*

The intersection lane configuration and control for the study area intersections are shown in **Figure 2**.

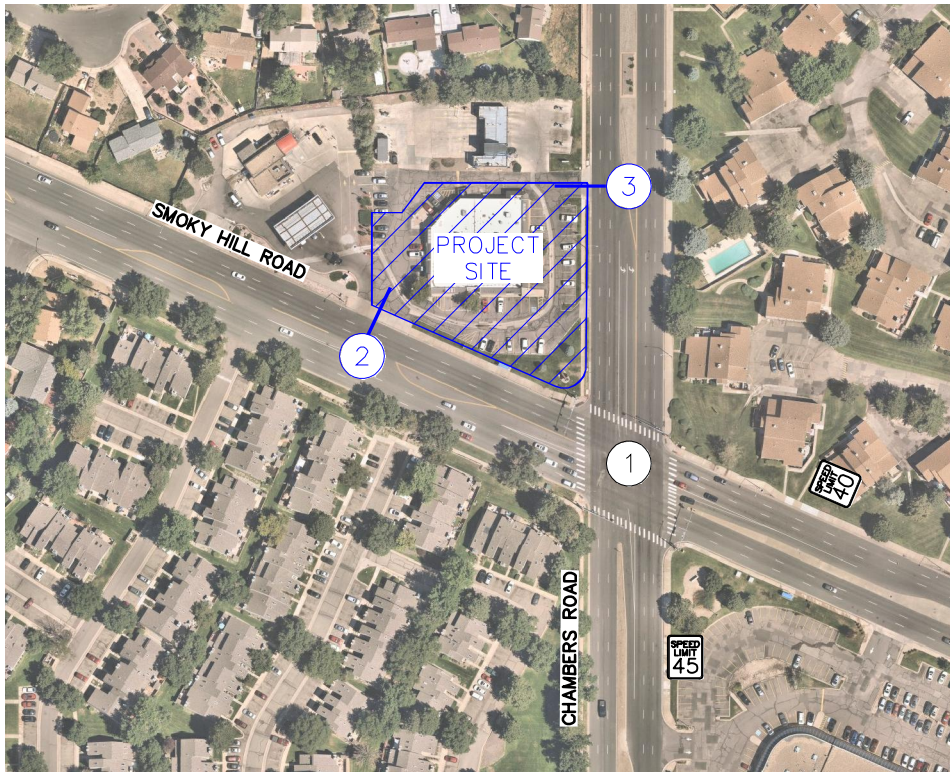
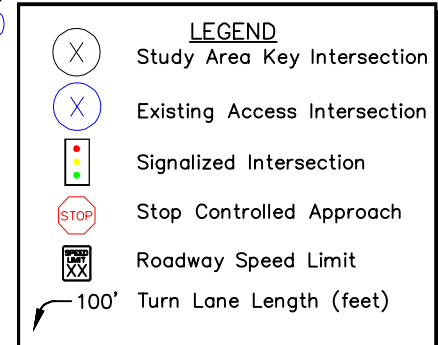
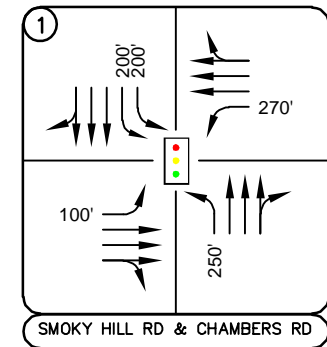
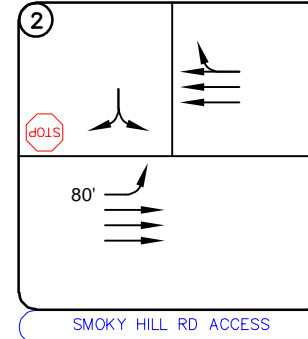
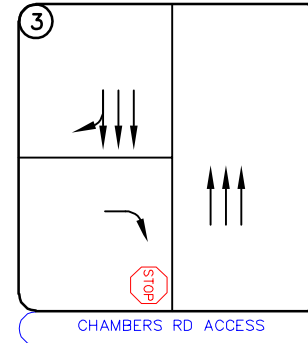


FIGURE 2  
QUIKTRIP 4274  
AURORA, COLORADO  
EXISTING GEOMETRY AND CONTROL



### 3.3 Existing Traffic Volumes

Existing turning movement counts were conducted at the intersection of Smoky Hill Road & Chambers Road on Thursday, October 19, 2023 during the weekday morning and afternoon peak hours. Since the two project accesses currently exist and are shared with the adjacent car washes, the driveway counts were also collected on October 19, 2023 to determine the existing driveway counts. To provide a conservative analysis, the existing driveway counts were used, and project traffic was added directly on top without removing any trips from the existing strip plaza. 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 are shown in **Figure 3** with count sheets provided in **Appendix A**.

### 3.4 Unspecified Development Traffic Growth

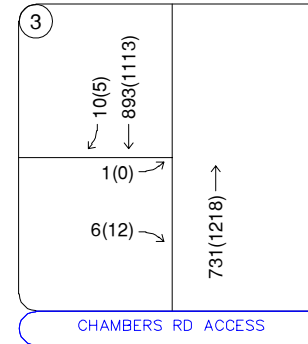
According to traffic projections from the Denver Regional Council of Governments (DRCOG) traffic model, the area surrounding the site is expected to have an average 30-year growth factor of 1.26 which equates to an annual growth rate of 0.77 percent. Future traffic volume projections and growth rate calculations are provided in **Appendix B**. This annual growth rate was used to estimate short-term 2026 and long-term 2050 traffic volume projections at the key intersections. The calculated background traffic volumes for 2026 and 2050 are shown in **Figure 4** and **Figure 5**, respectively.



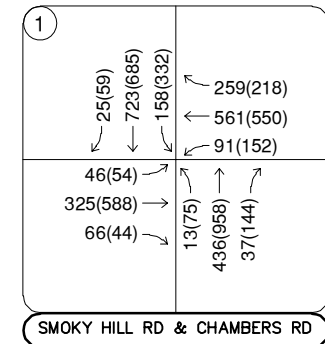


FIGURE 3  
QUIKTRIP 4274  
AURORA, COLORADO  
2023 EXISTING TRAFFIC VOLUMES

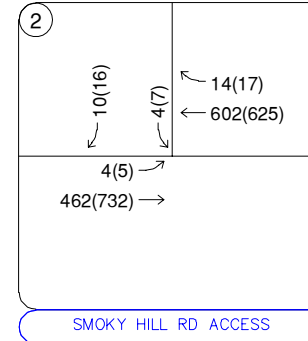
Thursday, October 19, 2023  
7:30 to 8:30AM (4:30 to 5:30PM)



Thursday, October 19, 2023  
7:30 to 8:30AM (4:45 to 5:45PM)



Thursday, October 19, 2023  
7:45 to 8:45AM (4:00 to 5:00PM)



### 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

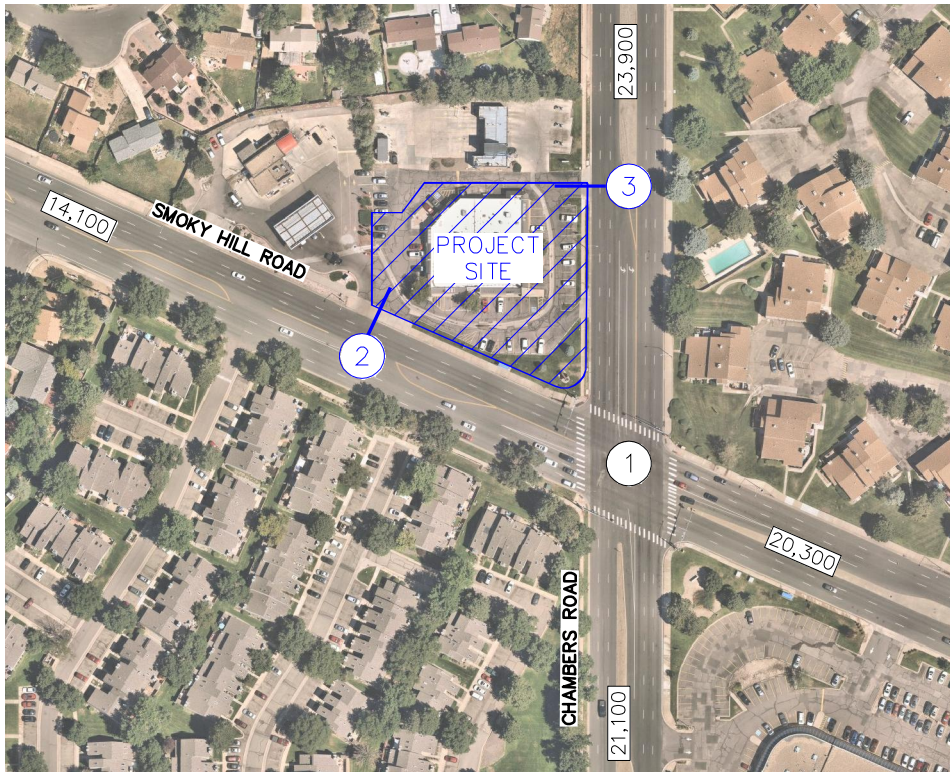
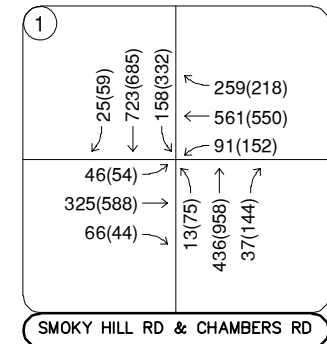
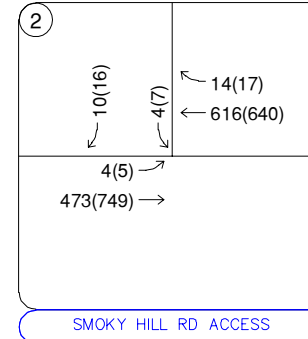
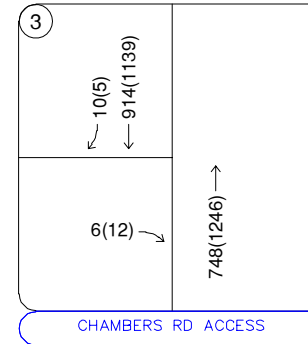


FIGURE 4  
QUIKTRIP 4274  
AURORA, COLORADO  
2026 BACKGROUND TRAFFIC VOLUMES



### 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



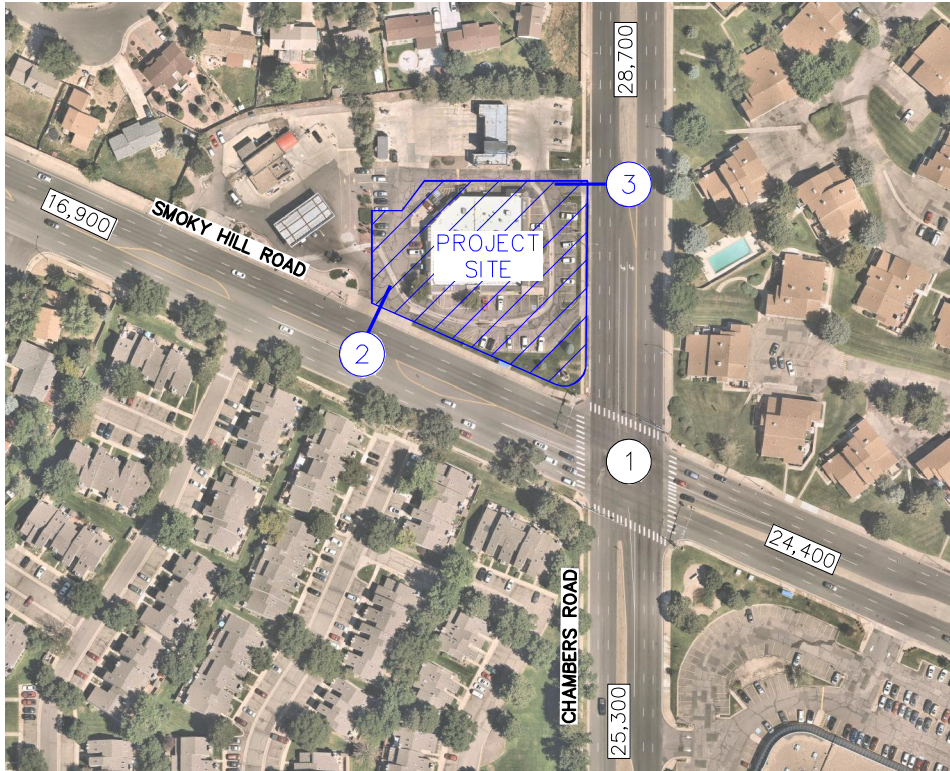
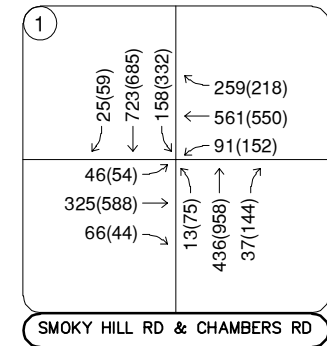
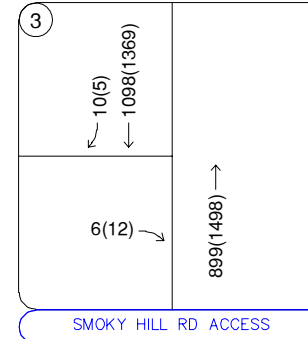
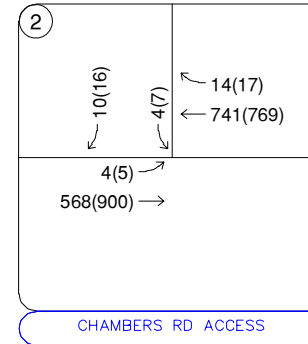


FIGURE 5  
QUIKTRIP 4274  
AURORA, COLORADO  
2050 BACKGROUND TRAFFIC VOLUMES



#### 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

## 4.0 PROJECT TRAFFIC CHARACTERISTICS

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### 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 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*<sup>1</sup> 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 apply to Convenience Store/Gas Station (ITE Land Use Code 945) for traffic associated with the development.

Since the project is a commercial development, pass-by trips are expected. These pass-by trips are vehicles already on the street network that will be attracted to the project site en route to a final destination. The pass-by percentages were obtained from the ITE “Trip Generation Manual”, Eleventh Edition which shows a morning peak hour pass-by percentage of 76 percent and an afternoon peak hour pass-by percentage of 75 percent for the gas station use.

QuikTrip 4274 is expected to generate approximately 3,600 daily weekday driveway trips, with 379 of these trips occurring during the morning peak hour and 319 trips occurring during the afternoon peak hour. Accounting for pass-by, expected net new (non pass-by) trips to the surrounding street network results in approximately 900 weekday daily trips, of which 91 trips and 80 trips are anticipated during the weekday morning and afternoon peak hours, respectively. Calculations were based on the procedure and information provided in the ITE *Trip Generation Manual*, 11<sup>th</sup> Edition – Volume 1: User’s Guide and Handbook, 2021. **Table 1** summarizes the estimated trip generation for the QuikTrip 4274. The trip generation worksheets are included in **Appendix C**.

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<sup>1</sup> Institute of Transportation Engineers, *Trip Generation Manual*, Eleventh Edition, Washington DC, 2021.

**Table 1 – QuikTrip 4274 Traffic Generation**

Land Use and Size	Weekday Vehicle Trips						
	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
Convenience Store/Gas Station (ITE 945) 14 FP/5,312 SF	3,600	189	190	379	159	160	319
<b>Non Pass-By Trips</b>	900	45	46	91	40	40	80
<b>Pass-By Trips</b>	2,700	144	144	288	119	120	239

#### 4.2 Trip Distribution

Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns, existing and anticipated surrounding demographic information, 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 project trip distribution for the proposed development is illustrated in **Figure 6**.

Since the project is a commercial development, a certain amount of traffic attracted to the gas station will already be passing by the site. This pass-by distribution is a means to quantify the amount of traffic arriving to the site from a given direction and then leaving the site in the same original direction of travel, continuing the driver's trip. The expected weekday morning and afternoon peak hour pass-by trip distributions were calculated based on actual traffic volumes at the intersection of Smoky Hill Road and Chambers Road. Directional differences in the morning and afternoon peak hours were accounted for in the pass-by distributions as shown in **Figures 7** and **8**, respectively.

#### 4.3 Traffic Assignment and Total Traffic Volumes

The project traffic assignment was obtained by applying the project trip distribution to the estimated traffic generation of the development shown in **Table 1**. Project non pass-by traffic assignment is shown in **Figure 9**, while **Figure 10** illustrates the expected pass-by traffic assignment. Site traffic volumes were added to the background volumes to represent estimated traffic conditions for the short-term 2026 buildout horizon and long-term 2050 planning horizon. These total traffic volumes for the study area are illustrated for the 2026 and 2050 horizon years in **Figures 11** and **12**, respectively.



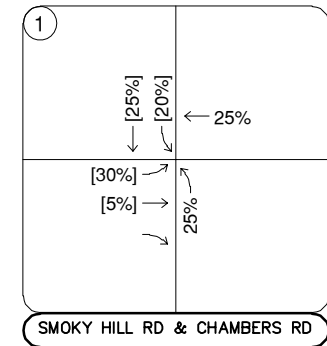
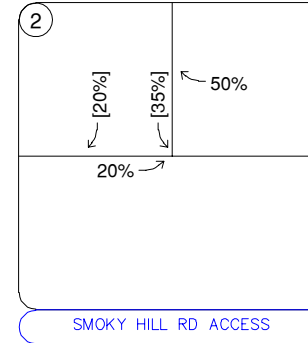
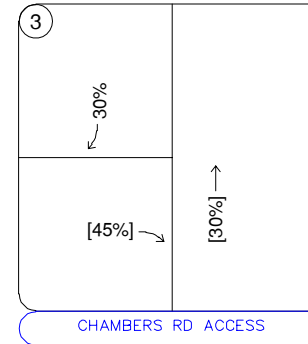
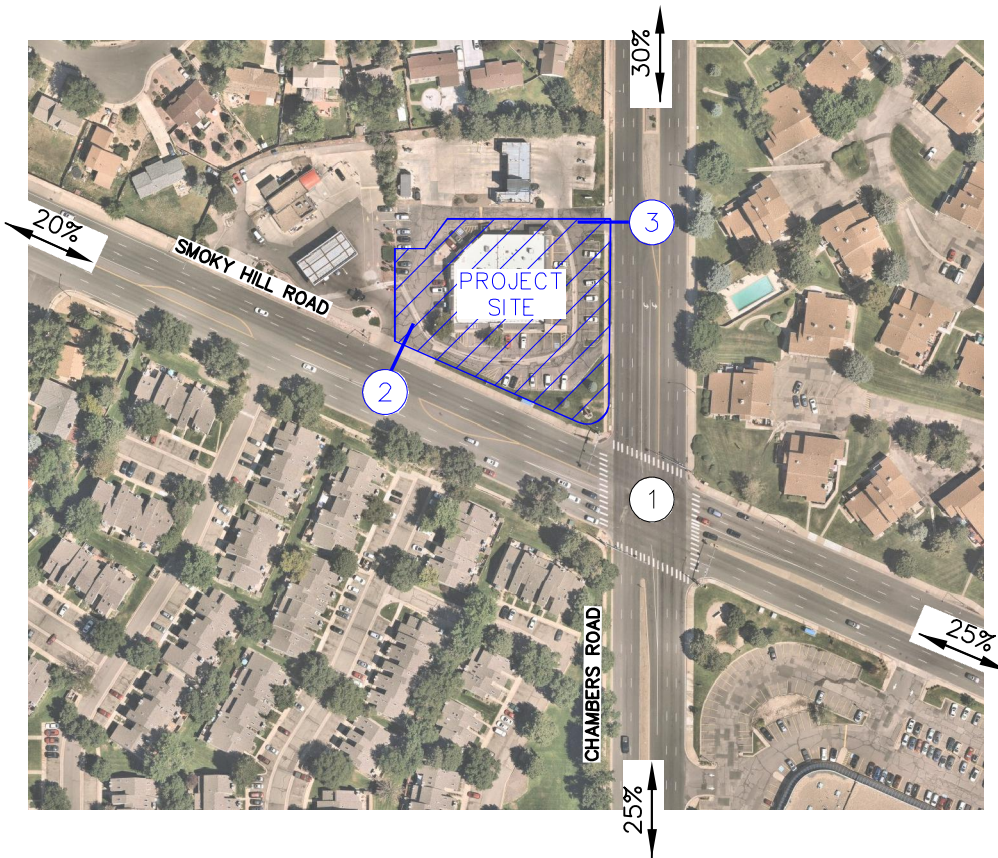
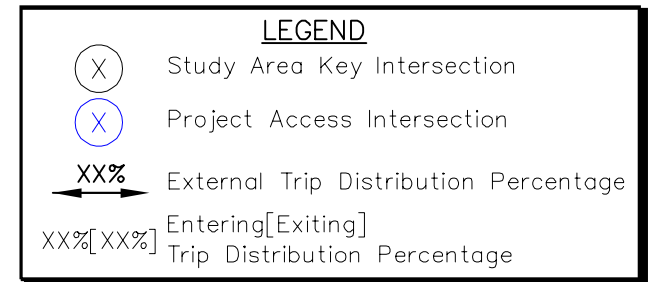


FIGURE 6  
 QUIKTRIP 4274  
 AURORA, COLORADO  
 NON PASS-BY PROJECT TRIP DISTRIBUTION



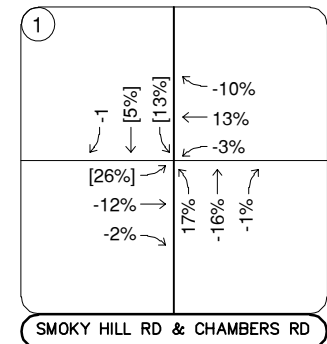
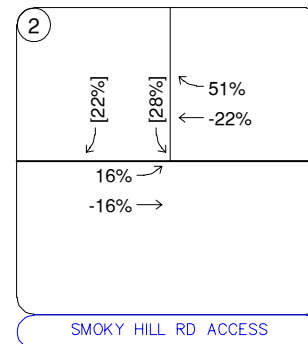
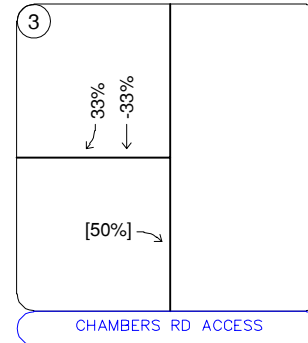
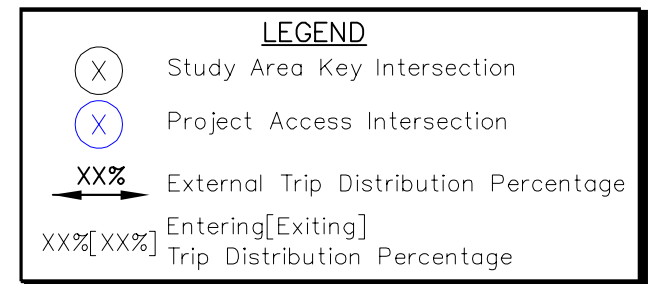


FIGURE 7  
 QUIKTRIP 4274  
 AURORA, COLORADO  
 AM PASS-BY PROJECT TRIP DISTRIBUTION





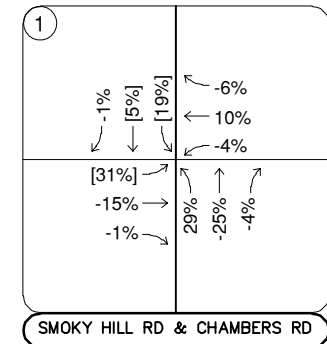
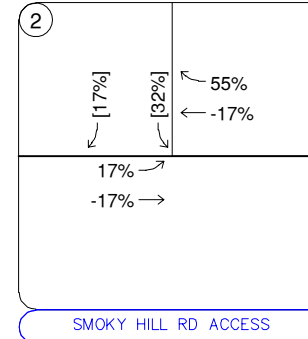
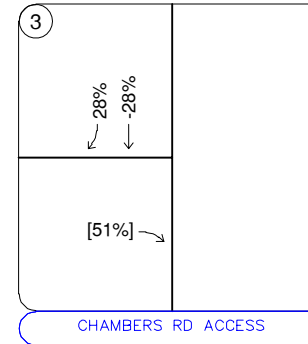


FIGURE 8  
 QUIKTRIP 4274  
 AURORA, COLORADO  
 PM PASS-BY PROJECT TRIP DISTRIBUTION

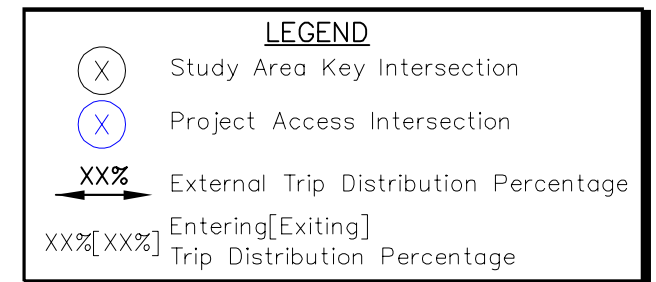
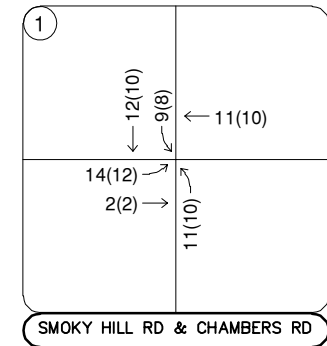
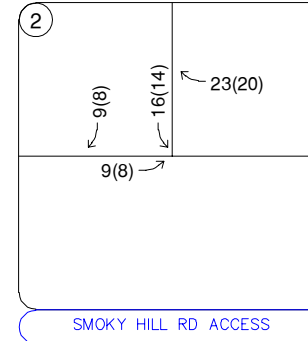
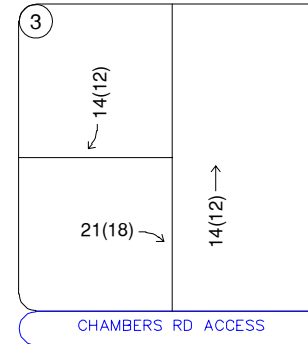






FIGURE 9  
QUIKTRIP 4274  
AURORA, COLORADO  
NON PASS-BY PROJECT TRAFFIC ASSIGNMENT



### 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

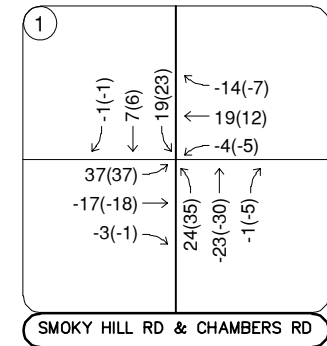
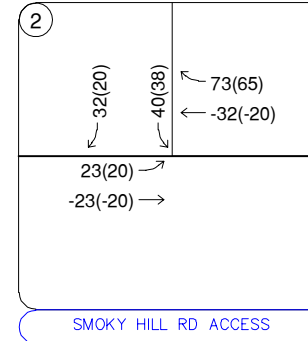
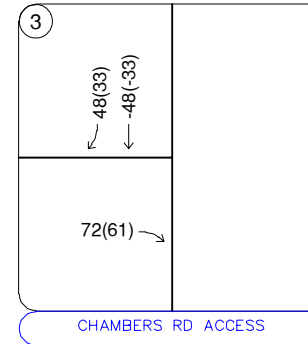
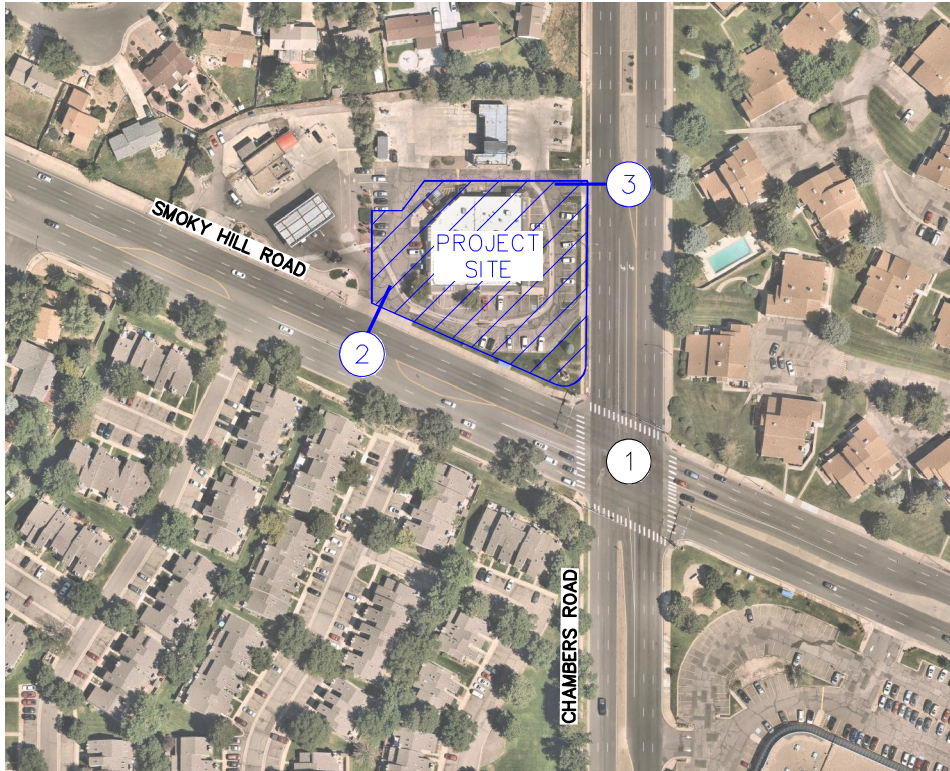


FIGURE 10  
QUIKTRIP 4274  
AURORA, COLORADO  
PASS-BY PROJECT TRAFFIC ASSIGNMENT

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



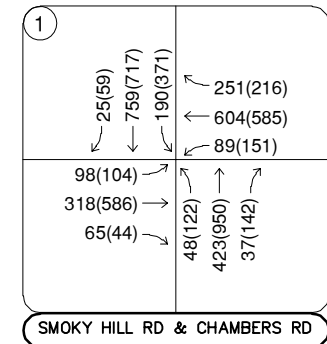
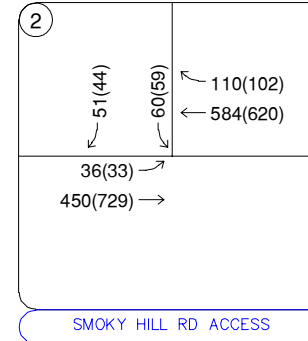
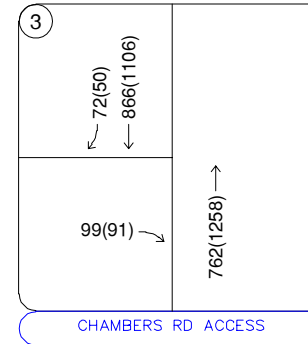
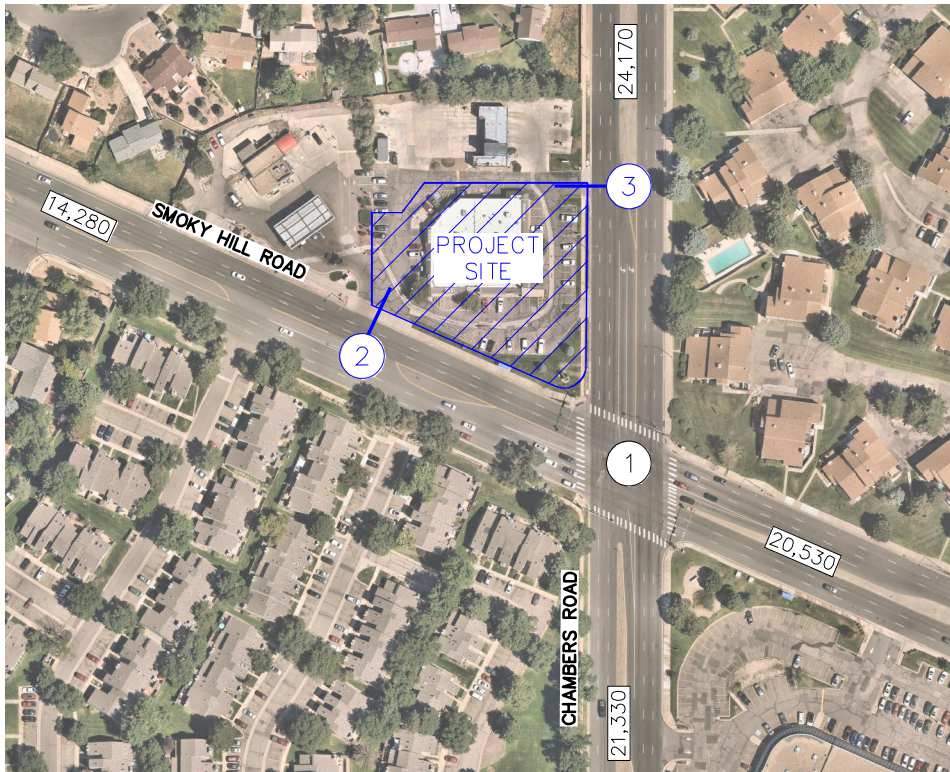


FIGURE 11  
QUIKTRIP 4274  
AURORA, COLORADO  
2026 TOTAL TRAFFIC VOLUMES

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

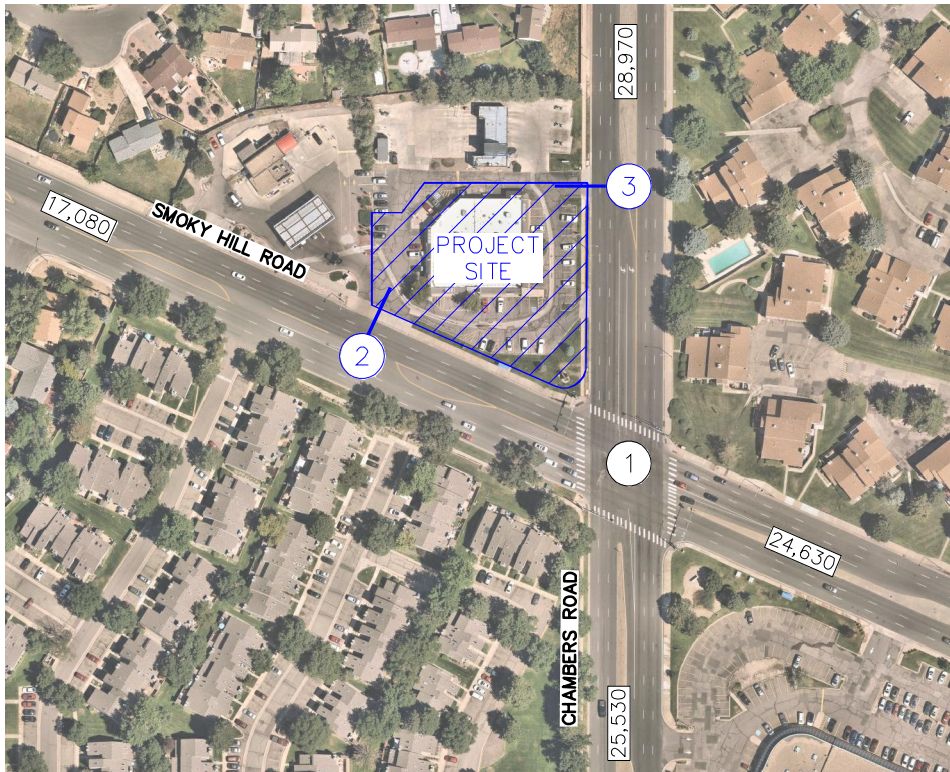
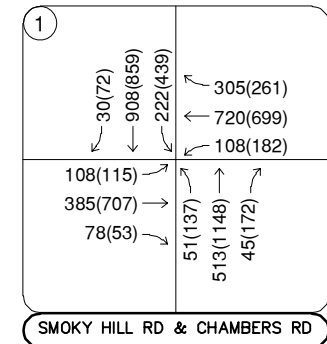
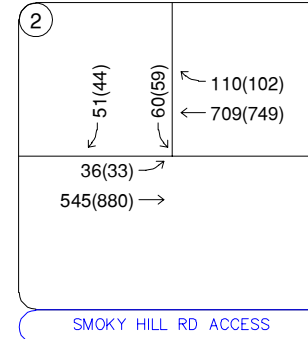
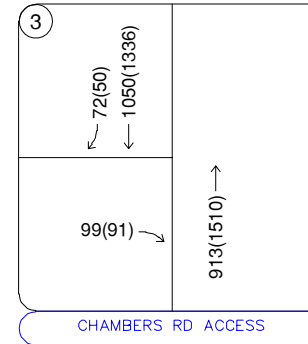


FIGURE 12  
QUIKTRIP 4274  
AURORA, COLORADO  
2050 TOTAL TRAFFIC VOLUMES



### 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

## 5.0 TRAFFIC OPERATIONS ANALYSIS

Kimley-Horn's analysis of traffic operations in the site vicinity was conducted to determine potential capacity deficiencies in the 2026 and 2050 development horizons at the identified key intersections. The acknowledged source for determining overall capacity is the *Highway Capacity Manual (HCM)*<sup>2</sup>.

### 5.1 Analysis Methodology

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). According to City of Aurora guidelines for signalized intersections, individual movements may be allowed to fall to LOS E, but in most cases the overall intersection must operate (or be projected to operate) at a LOS D or better during AM and PM peak periods. If the existing LOS for an intersection is 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. **Table 2** shows the definition of level of service for signalized and unsignalized intersections.

**Table 2 – Level of Service Definitions**

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

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

<sup>2</sup> Transportation Research Board, *Highway Capacity Manual*, Sixth Edition, Washington DC, 2016.



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

## 5.2 Key Intersection Operational Analysis

Calculations for the operational level of service at the key intersections for the study area are provided in **Appendix D**. The existing year analysis is based on the lane geometry and intersection control shown in **Figure 2**. Existing peak hour factors were utilized in the analysis. The existing heavy vehicle percentages obtained from the turning movement counts were also used in each horizon year. The signalized intersection analysis utilizes the observed cycle lengths with optimized phasing and timing. Based on increased national attention given to establishing appropriate yellow and all-red clearance intervals to improve intersection safety, these have been calculated and are applied for approaches at the signalized intersections. The increase in yellow and all red time sacrifices intersection capacity for improved safety. Synchro traffic analysis software was used to analyze the signalized and unsignalized key intersections for HCM level of service.

### Smoky Hill Road and Chambers Road

The signalized intersection of Smoky Hill Road and Chambers Road operates with protected-permitted left turn phasing on all four approaches. The intersection operates acceptably at LOS C during both peak hours under existing conditions. With project traffic, the intersection is anticipated to continue operating at an acceptable level of service throughout the 2050 horizon. Therefore, no improvements or modifications are anticipated to be needed at this intersection based on the addition of project traffic and this operational level of service analysis. Of note, the future traffic conditions can sometimes report less delays than the existing condition when traffic assignment volumes are added to movement that have less movement delay than the average intersection delay. **Table 3** provides the results of the LOS analysis conducted at this intersection.

**Table 3 – Smoky Hill Road & Chambers Road LOS Results**

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
<b>2023 Existing</b>	<b>32.6</b>	<b>C</b>	<b>34.9</b>	<b>C</b>
Eastbound Approach	49.3	D	62.4	E
Eastbound Left	45.8	D	48.5	D
Eastbound Through	49.4	D	61.8	E
Eastbound Right	50.1	D	66.9	E
Westbound Approach	52.3	D	53.7	D
Westbound Left	41.9	D	46.8	D
Westbound Through	52.6	D	53.8	D
Westbound Right	55.1	E	57.5	E
Northbound Approach	15.0	B	21.2	C
Northbound Left	12.8	B	14.6	B
Northbound Through	15.0	B	21.3	C
Northbound Right	15.2	B	22.1	C
Southbound Approach	14.1	B	16.3	B
Southbound Left	11.8	B	15.7	B
Southbound Through	14.5	B	16.5	B
Southbound Right	14.8	B	16.8	B
<b>2026 Background</b>	<b>32.6</b>	<b>C</b>	<b>35.5</b>	<b>D</b>
Eastbound Approach	48.9	D	63.7	E
Eastbound Left	45.4	D	48.4	D
Eastbound Through	49.0	D	62.9	E
Eastbound Right	49.7	D	68.9	E
Westbound Approach	51.9	D	53.8	D
Westbound Left	41.4	D	46.7	D
Westbound Through	52.3	D	53.9	D
Westbound Right	54.7	D	57.9	E
Northbound Approach	15.4	B	21.8	C
Northbound Left	13.2	B	14.9	B
Northbound Through	15.4	B	22.0	C
Northbound Right	15.6	B	22.9	C
Southbound Approach	14.5	B	16.8	B
Southbound Left	12.1	B	16.4	B
Southbound Through	14.9	B	16.9	B
Southbound Right	15.2	B	17.3	B

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
<b>2026 Background Plus Project</b>	<b>33.4</b>	<b>C</b>	<b>36.5</b>	<b>D</b>
Eastbound Approach	44.7	D	56.2	E
Eastbound Left	42.8	D	46.6	D
Eastbound Through	45.1	D	56.7	E
Eastbound Right	45.5	D	69.8	E
Westbound Approach	52.5	D	58.7	E
Westbound Left	39.2	D	44.1	D
Westbound Through	52.9	D	58.9	E
Westbound Right	56.0	E	66.6	E
Northbound Approach	17.5	B	23.6	C
Northbound Left	14.9	B	16.3	B
Northbound Through	17.7	B	24.2	C
Northbound Right	17.9	B	25.1	C
Southbound Approach	17.6	B	19.1	B
Southbound Left	14.2	B	18.0	B
Southbound Through	18.2	B	19.6	B
Southbound Right	18.6	B	2.0	B
<b>2050 Background</b>	<b>33.5</b>	<b>C</b>	<b>41.0</b>	<b>D</b>
Eastbound Approach	45.3	D	68.1	E
Eastbound Left	42.2	D	46.6	D
Eastbound Through	45.5	D	66.8	E
Eastbound Right	46.0	D	75.6	E
Westbound Approach	50.1	D	56.3	E
Westbound Left	37.4	D	50.4	D
Westbound Through	50.4	D	55.4	E
Westbound Right	53.8	D	61.9	E
Northbound Approach	19.6	B	29.3	C
Northbound Left	16.5	B	18.5	B
Northbound Through	19.6	B	29.5	C
Northbound Right	19.9	B	31.1	C
Southbound Approach	18.5	B	23.3	C
Southbound Left	14.9	B	27.8	C
Southbound Through	19.1	B	21.2	C
Southbound Right	19.5	B	21.8	C



Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
<b>2050 Background Plus Project</b>	<b>34.6</b>	<b>C</b>	<b>41.5</b>	<b>D</b>
Eastbound Approach	41.9	D	57.6	E
Eastbound Left	40.6	D	47.6	D
Eastbound Through	42.1	D	57.4	E
Eastbound Right	42.5	D	62.1	E
Westbound Approach	51.1	D	60.3	E
Westbound Left	35.5	D	45.5	D
Westbound Through	51.4	D	60.1	E
Westbound Right	55.4	E	69.3	E
Northbound Approach	21.7	C	31.6	C
Northbound Left	18.4	B	20.3	C
Northbound Through	21.9	C	32.1	C
Northbound Right	22.2	C	34.0	C
Southbound Approach	21.6	C	26.3	C
Southbound Left	17.2	B	29.8	C
Southbound Through	22.4	C	24.4	C
Southbound Right	23.0	C	25.1	C

### Project Accesses

With redevelopment of the existing site to a gas station, the existing right-in only access along Chambers Road will be removed. Additionally, the existing full movement driveway along Smoky Hill Road will be narrowed from the existing 75-foot driveway to 35-feet. This reduced driveway width will result in less confusion for inbound and outbound drivers. The existing right-in/right-out access along Chambers Road will remain. An R1-1 “STOP” sign is recommended to be placed at both approaches exiting the site. **Table 4** provides the results of the level of service for this project street access. As shown in the table, the project street access intersections are anticipated to have all movements operating with acceptable LOS during the peak hours in both the buildout year 2026 and the 2050 long-term horizons.

**Table 4 – Project Access Level of Service Results**

Intersection	2026 Total				2050 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
<b>Smoky Hill Full Access</b>								
Eastbound Left	9.3	A	9.4	A	9.7	A	9.4	A
Southbound Approach	11.8	B	12.6	B	12.5	B	13.3	B
<b>Chambers RIRO Access</b>								
Eastbound Right	16.0	C	18.5	C	18.4	C	22.6	C

### 5.3 Turn Bay Length Analysis

The City of Aurora defaults to the Colorado Department of Transportation (CDOT) State Highway Access Code (SHAC) guidelines to determine if turn lanes are warranted at studied intersections. CDOT classifies their state highways based on roadway types. It is believed that Smoky Hill Road and Chambers Road 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.

However, since Chambers Road and Smoky Hill Road both provide three through lanes in each direction, the auxiliary right turn lane can be absorbed within the third through lane. Therefore, based on the 2050 traffic volume projection, the eastbound left turn lane warrant into the project access along Smoky Hill Road is the following:

#### Smoky Hill Road Access

- An east left turn lane **is** warranted at the project access along Smoky Hill Road based on projected 2050 background plus project traffic volumes being 38 westbound left turns during the peak hour and the threshold being 25 vph. However, an existing eastbound left turn lane is provided with a length of approximately 100 feet. Based on the 40 mile per hour speed limit, the storage length is 40 feet with a 145-foot taper (12:1). However, the turn lane cannot be further extended to the west since extending the turn lane will block the full movement access at Fraser Circle. This existing eastbound left turn lane at the Smoky Hill Road access has a unique entry design that could be leading to driver confusion; therefore, the City of Aurora could consider introducing a small 10-foot striped bulb out with a reduced 25-foot taper to define a clear left turn entry for this turn lane.

## 5.4 Vehicle Queuing Analysis

A vehicle queuing analysis was conducted for the study area intersections. The queuing analysis was performed using Synchro presenting the results of the 95<sup>th</sup> percentile queue lengths. Results are shown in the following **Table 5** with calculations provided within the level of service operational sheets of **Appendix D** for unsignalized intersections and **Appendix E** for signalized intersections.

**Table 5 – Turn Lane Queuing Analysis Results**

Intersection Turn Lane	Existing Turn Lane Length (feet)	2026 Calculated Queue (feet)	2026 Recommended Length (feet)	2050 Calculated Queue (feet)	2050 Recommended Length (feet)
<b>Smoky Hill &amp; Chambers</b>					
Eastbound Left	100'	109'	100'	122'	125'
Westbound Left	270'	160'	270'	208'	270'
Northbound Left	250'	94'	250'	104'	250'
Southbound Left	200' DL	125' DL	200' DL	229' DL	225' DL
<b>Smoky Hill Access</b>					
Eastbound Left	80'	25'	80'	25'	80'

DL = Dual Left Turn Lanes; Blue Text = Recommendation

The vehicle queues are all anticipated to remain within the existing turn lane lengths through the short-term 2026 horizon. However, if 2050 volumes are realized, then the eastbound left turn lane at the Smoky Hill Road / Chambers Road intersection may need to be extended from 100 feet to 125 feet and the dual southbound left turn lanes may need to extend from 200 feet to 225 feet. The taper for these longer dual southbound left turn lanes can be extended within the existing raised median. However, additional median work will be required to prohibit vehicles from exiting the Chamber Road access with a left turn maneuver.

## 5.5 Improvement Summary

Based on the results of the intersection operational and vehicle queuing analysis, the key intersection recommended improvements and control are shown in **Figure 13** for the long-term 2050 horizon.

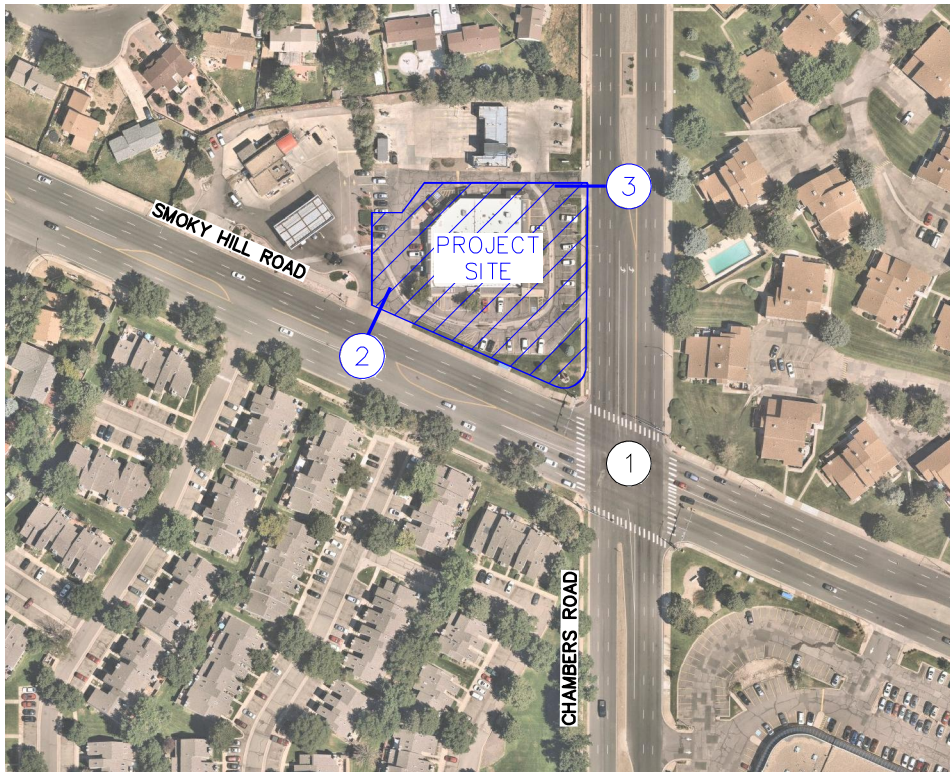
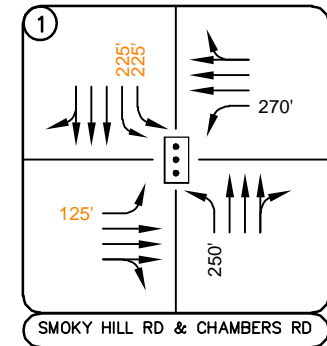
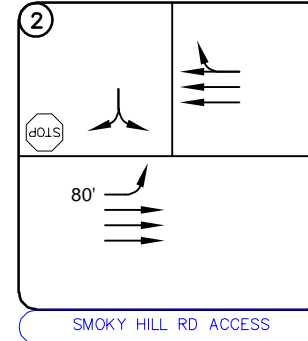
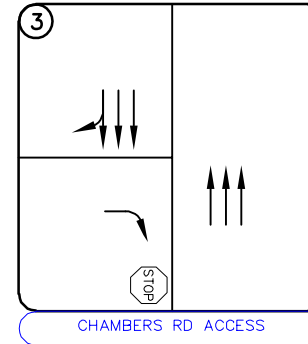


FIGURE 13  
QUIKTRIP 4274  
AURORA, COLORADO  
2050 RECOMMENDED GEOMETRY AND CONTROL



**LEGEND**

- (X) Study Area Key Intersection
- (X) Project Access Intersection
- Signalized Intersection
- Stop Controlled Approach
- Improvement
- 100' Turn Lane Length (feet)

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

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Based on the analysis presented in this report, Kimley-Horn believes QuikTrip 4274 will be successfully incorporated into the existing and future roadway network. Analysis of the existing street network, the proposed project development, and expected traffic volumes resulted in the following conclusions and recommendations:

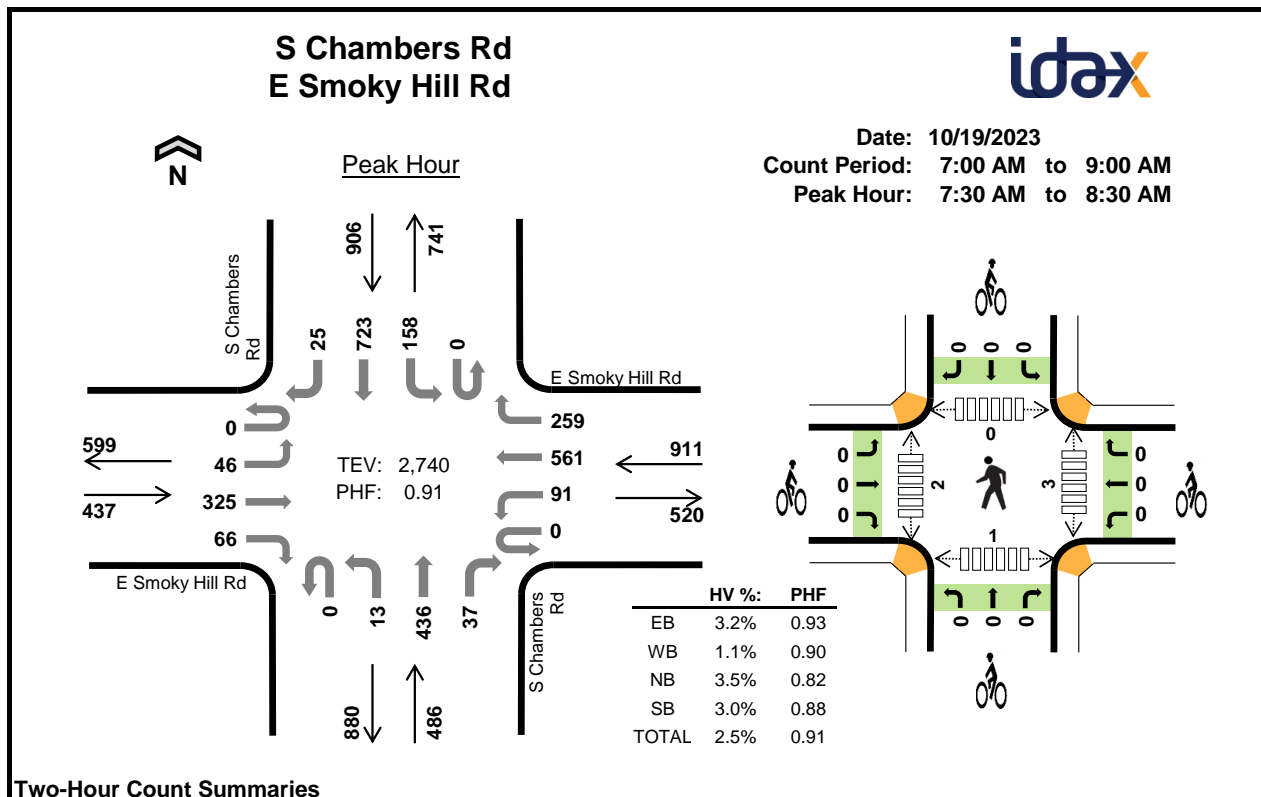
- With redevelopment of the existing site to a gas station, the existing right-in only access along Chambers Road will be removed. Additionally, the existing full movement driveway along Smoky Hill Road will be narrowed from the existing 75-foot driveway to 35-feet. This reduced driveway width will result in less confusion for inbound and outbound drivers. The existing right-in/right-out access along Chambers Road will remain. An R1-1 “STOP” sign is recommended to be placed at both approaches exiting the site.
- For planning level purposes and if 2050 volumes are realized at the Smoky Hill Road / Chambers Road intersection, the eastbound left turn lane may need to be extended to 125 feet and the dual southbound left turn lanes to 225 feet. The taper for these longer dual southbound left turn lanes can be extended within the existing raised median. However, additional median work will be required to prohibit vehicles from exiting the Chamber Road access with a left turn maneuver.
- Any onsite or offsite improvements should be incorporated into the Civil Drawings and conform to standards of the City of Aurora and the Manual on Uniform Traffic Control Devices (MUTCD) – 2009 Edition.

# APPENDICES

# APPENDIX A

## Intersection Count Sheets





## Two-Hour Count Summaries

Interval Start		E Smoky Hill Rd				E Smoky Hill Rd				S Chambers Rd				S Chambers 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	11	54	11	0	20	132	51	0	2	83	4	0	23	146	4	541	0
7:15 AM		0	11	75	12	0	17	158	69	0	4	87	11	0	23	138	2	607	0
7:30 AM		0	10	71	16	0	21	125	76	0	4	106	9	0	33	218	6	695	0
7:45 AM		0	11	89	17	0	25	152	76	0	0	138	10	0	36	195	6	755	2,598
8:00 AM		0	10	87	13	0	21	130	54	0	5	96	12	0	44	139	6	617	2,674
8:15 AM		0	15	78	20	0	24	154	53	0	4	96	6	0	45	171	7	673	2,740
8:30 AM		0	14	96	18	0	34	155	45	0	7	85	9	0	39	138	5	645	2,690
8:45 AM		0	11	73	11	0	37	119	49	0	6	101	17	0	54	179	4	661	2,596
Count Total		0	93	623	118	0	199	1,125	473	0	32	792	78	0	297	1,324	40	5,194	0
Peak Hour	All	0	46	325	66	0	91	561	259	0	13	436	37	0	158	723	25	2,740	0
	HV	0	0	13	1	0	0	8	2	0	0	15	2	0	11	15	1	68	0
	HV%	-	0%	4%	2%	-	0%	1%	1%	-	0%	3%	5%	-	7%	2%	4%	2%	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	2	2	6	0	0	0	0	0	0	1	0	0	1
7:15 AM	2	3	2	6	13	0	0	0	0	0	0	0	0	0	0
7:30 AM	2	1	5	6	14	0	0	0	0	0	1	2	0	1	4
7:45 AM	4	1	5	6	16	0	0	0	0	0	0	0	0	0	0
8:00 AM	3	1	5	8	17	0	0	0	0	0	0	0	0	0	0
8:15 AM	5	7	2	7	21	0	0	0	0	0	2	0	0	0	2
8:30 AM	3	5	2	7	17	0	0	0	0	0	0	0	0	2	2
8:45 AM	4	6	3	4	17	0	0	0	0	0	0	0	0	0	0
Count Total	25	24	26	46	121	0	0	0	0	0	3	3	0	3	9
Peak Hour	14	10	17	27	68	0	0	0	0	0	3	2	0	1	6

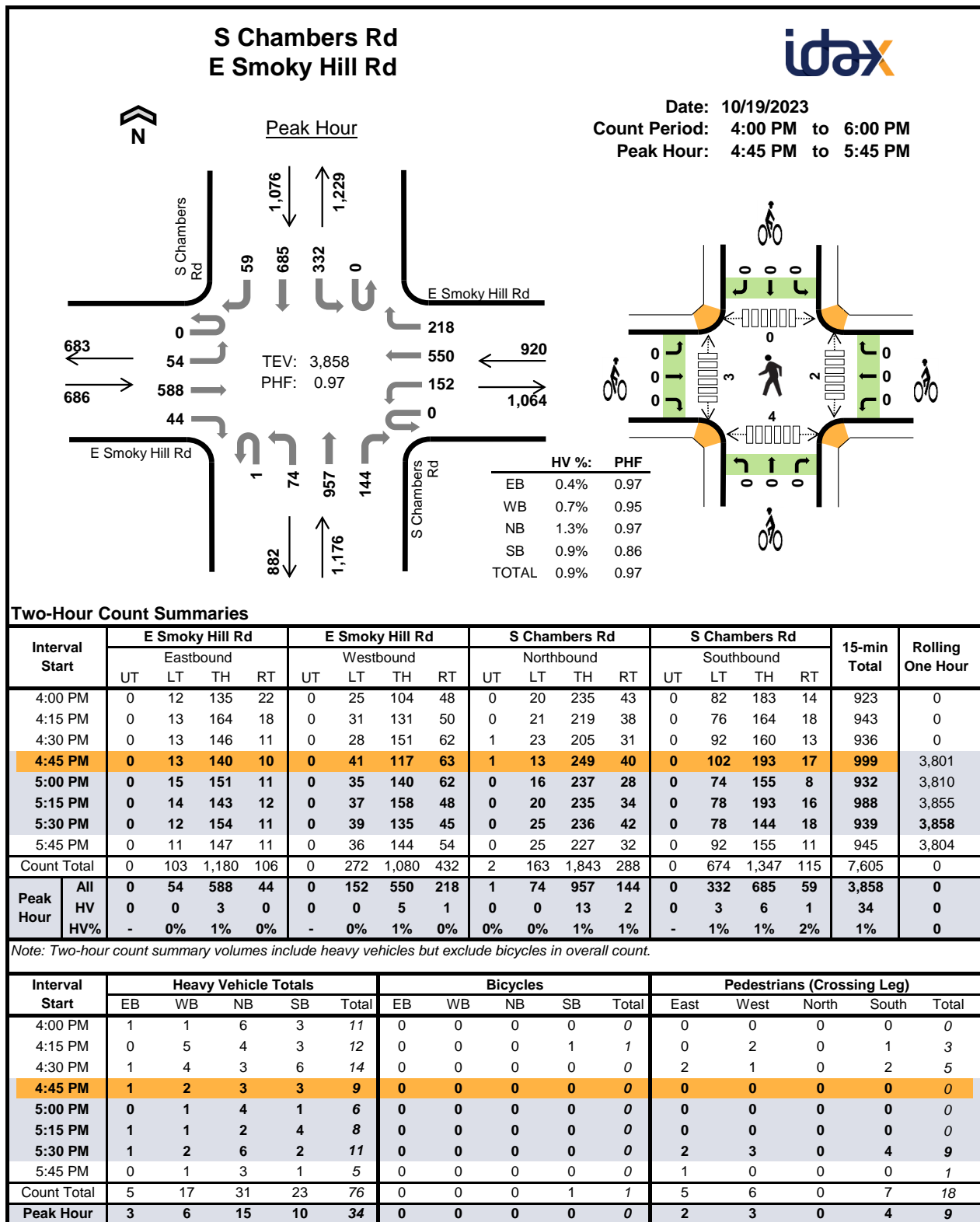
**Two-Hour Count Summaries - Heavy Vehicles**

Interval Start	E Smoky Hill Rd				E Smoky Hill Rd				S Chambers Rd				S Chambers 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	0	2	0	0	0	0	0	0	0	2	0	0	0	2	0	6	0
7:15 AM	0	0	2	0	0	0	1	2	0	0	2	0	0	3	3	0	13	0
7:30 AM	0	0	2	0	0	0	1	0	0	0	5	0	0	0	6	0	14	0
7:45 AM	0	0	4	0	0	0	1	0	0	0	4	1	0	2	4	0	16	49
8:00 AM	0	0	3	0	0	0	1	0	0	0	4	1	0	4	4	0	17	60
8:15 AM	0	0	4	1	0	0	5	2	0	0	2	0	0	5	1	1	21	68
8:30 AM	0	0	3	0	0	0	3	2	0	0	2	0	0	2	5	0	17	71
8:45 AM	0	0	4	0	0	0	3	3	0	0	2	1	0	1	3	0	17	72
Count Total	0	0	24	1	0	0	15	9	0	0	23	3	0	17	28	1	121	0
Peak Hour	0	0	13	1	0	0	8	2	0	0	15	2	0	11	15	1	68	0

**Two-Hour Count Summaries - Bikes**

Interval Start	E Smoky Hill Rd			E Smoky Hill Rd			S Chambers Rd			S Chambers 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 - Heavy Vehicles**

Interval Start	E Smoky Hill Rd				E Smoky Hill Rd				S Chambers Rd				S Chambers 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	0	1	0	0	0	1	0	0	0	6	0	0	1	2	0	11	0
4:15 PM	0	0	0	0	0	0	4	1	0	0	4	0	0	0	3	0	12	0
4:30 PM	0	0	1	0	0	0	4	0	0	0	3	0	0	2	4	0	14	0
4:45 PM	0	0	1	0	0	0	2	0	0	0	3	0	0	2	1	0	9	46
5:00 PM	0	0	0	0	0	0	0	1	0	0	4	0	0	0	1	0	6	41
5:15 PM	0	0	1	0	0	0	1	0	0	0	2	0	0	1	3	0	8	37
5:30 PM	0	0	1	0	0	0	2	0	0	0	4	2	0	0	1	1	11	34
5:45 PM	0	0	0	0	0	0	1	0	0	0	3	0	0	1	0	0	5	30
Count Total	0	0	5	0	0	0	15	2	0	0	29	2	0	7	15	1	76	0
Peak Hour	0	0	3	0	0	0	5	1	0	0	13	2	0	3	6	1	34	0

**Two-Hour Count Summaries - Bikes**

Interval Start	E Smoky Hill Rd			E Smoky Hill Rd			S Chambers Rd			S Chambers 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	1	1	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	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
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	1	1	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.

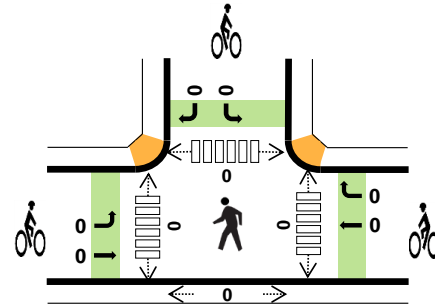
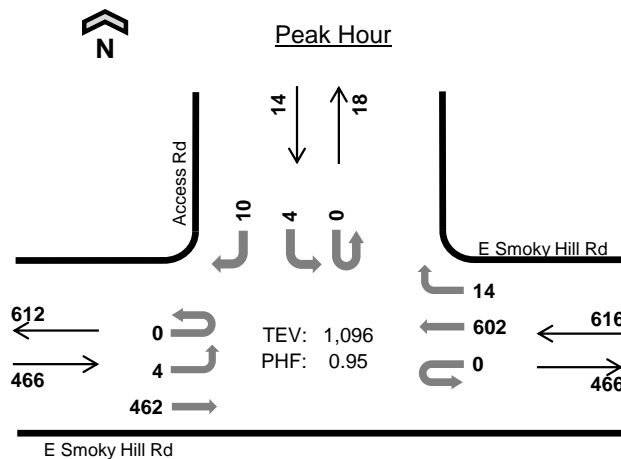
## Access Rd E Smoky Hill Rd



Date: 10/19/2023

Count Period: 7:00 AM to 9:00 AM

Peak Hour: 7:45 AM to 8:45 AM



	HV %:	PHF
EB	3.6%	0.87
WB	1.6%	0.93
NB	-	-
SB	0.0%	0.70
TOTAL	2.5%	0.95

### Two-Hour Count Summaries

Interval Start		E Smoky Hill Rd				E Smoky Hill Rd				N/A				Access 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	0	75	0	0	0	142	3	0	0	0	0	0	0	0	0	220	0
7:15 AM		0	0	96	0	0	0	150	0	0	0	0	0	0	0	0	2	248	0
7:30 AM		0	0	92	0	0	0	154	1	0	0	0	0	0	1	0	0	248	0
7:45 AM		0	1	133	0	0	0	140	2	0	0	0	0	0	1	0	0	277	993
8:00 AM		0	3	97	0	0	0	141	7	0	0	0	0	0	0	0	4	252	1,025
8:15 AM		0	0	110	0	0	0	163	3	0	0	0	0	0	2	0	2	280	1,057
8:30 AM		0	0	122	0	0	0	158	2	0	0	0	0	0	1	0	4	287	1,096
8:45 AM		0	2	105	0	0	0	132	1	0	0	0	0	0	1	0	0	241	1,060
Count Total		0	6	830	0	0	0	1,180	19	0	0	0	0	0	6	0	12	2,053	0
Peak Hour	All	0	4	462	0	0	0	602	14	0	0	0	0	0	4	0	10	1,096	0
	HV	0	0	17	0	0	0	10	0	0	0	0	0	0	0	0	0	27	0
	HV%	-	0%	4%	-	-	-	2%	0%	-	-	-	-	-	0%	-	0%	2%	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	0	0	2	0	0	0	0	0	0	0	0	1	1
7:15 AM	2	0	0	0	2	0	0	0	0	0	0	0	0	2	2
7:30 AM	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0
7:45 AM	5	1	0	0	6	0	0	0	0	0	0	0	0	0	0
8:00 AM	3	1	0	0	4	0	0	0	0	0	0	0	0	0	0
8:15 AM	4	6	0	0	10	0	0	0	0	0	0	0	0	0	0
8:30 AM	5	2	0	0	7	0	0	0	0	0	0	0	0	0	0
8:45 AM	3	4	0	0	7	0	0	0	0	0	0	0	0	0	0
Count Total	25	16	0	0	41	0	0	0	0	0	0	0	0	3	3
Peak Hr	17	10	0	0	27	0	0	0	0	0	0	0	0	0	0



Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	E Smoky Hill Rd				E Smoky Hill Rd				N/A				Access 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	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
7:15 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
7:30 AM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	3	0
7:45 AM	0	0	5	0	0	0	1	0	0	0	0	0	0	0	0	0	6	13
8:00 AM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	4	15
8:15 AM	0	0	4	0	0	0	6	0	0	0	0	0	0	0	0	0	10	23
8:30 AM	0	0	5	0	0	0	2	0	0	0	0	0	0	0	0	0	7	27
8:45 AM	0	0	3	0	0	0	4	0	0	0	0	0	0	0	0	0	7	28
Count Total	0	0	25	0	0	0	16	0	0	0	0	0	0	0	0	0	41	0
Peak Hour	0	0	17	0	0	0	10	0	0	0	0	0	0	0	0	0	27	0

Two-Hour Count Summaries - Bikes																
Interval Start	E Smoky Hill Rd			E Smoky Hill Rd			N/A			Access 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.

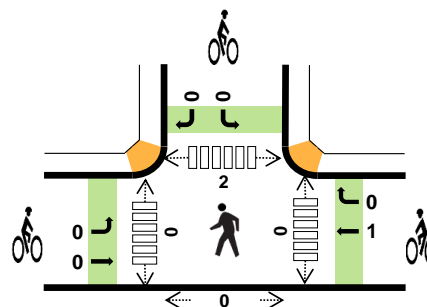
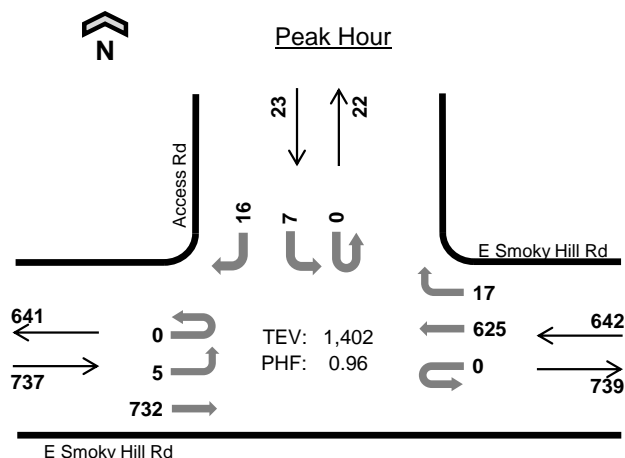
## Access Rd E Smoky Hill Rd



Date: 10/19/2023

Count Period: 4:00 PM to 6:00 PM

Peak Hour: 4:00 PM to 5:00 PM



	HV %:	PHF
EB	0.4%	0.94
WB	1.6%	0.92
NB	-	-
SB	0.0%	0.64
TOTAL	0.9%	0.96

### Two-Hour Count Summaries

Interval Start	E Smoky Hill Rd				E Smoky Hill Rd				N/A				Access Rd				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	187	0	0	0	140	3	0	0	0	0	0	1	0	4	335	0
4:15 PM	0	1	182	0	0	0	167	7	0	0	0	0	0	4	0	5	366	0
4:30 PM	0	0	172	0	0	0	163	2	0	0	0	0	0	2	0	4	343	0
4:45 PM	0	4	191	0	0	0	155	5	0	0	0	0	0	0	0	3	358	1,402
5:00 PM	0	1	156	0	0	0	166	3	0	0	0	0	0	2	0	1	329	1,396
5:15 PM	0	1	164	0	0	0	190	5	0	0	0	0	0	3	0	3	366	1,396
5:30 PM	0	1	165	0	0	0	176	0	0	0	0	0	0	3	0	1	346	1,399
5:45 PM	0	0	154	0	0	0	174	2	0	0	0	0	0	2	0	6	338	1,379
Count Total	0	8	1,371	0	0	0	1,331	27	0	0	0	0	0	17	0	27	2,781	0
Peak Hour	All	0	5	732	0	0	0	625	17	0	0	0	0	7	0	16	1,402	0
	HV	0	0	3	0	0	0	10	0	0	0	0	0	0	0	0	13	0
	HV%	-	0%	0%	-	-	-	2%	0%	-	-	-	-	0%	-	0%	1%	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	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	5	0	0	5	0	1	0	0	1	0	0	1	0	1
4:30 PM	1	3	0	0	4	0	0	0	0	0	0	0	1	0	1
4:45 PM	1	1	0	0	2	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	0
5:15 PM	1	1	0	0	2	0	0	0	0	0	0	0	1	0	1
5:30 PM	1	4	0	0	5	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
Count Total	5	16	0	0	21	0	1	0	0	1	0	0	3	0	3
Peak Hr	3	10	0	0	13	0	1	0	0	1	0	0	2	0	2

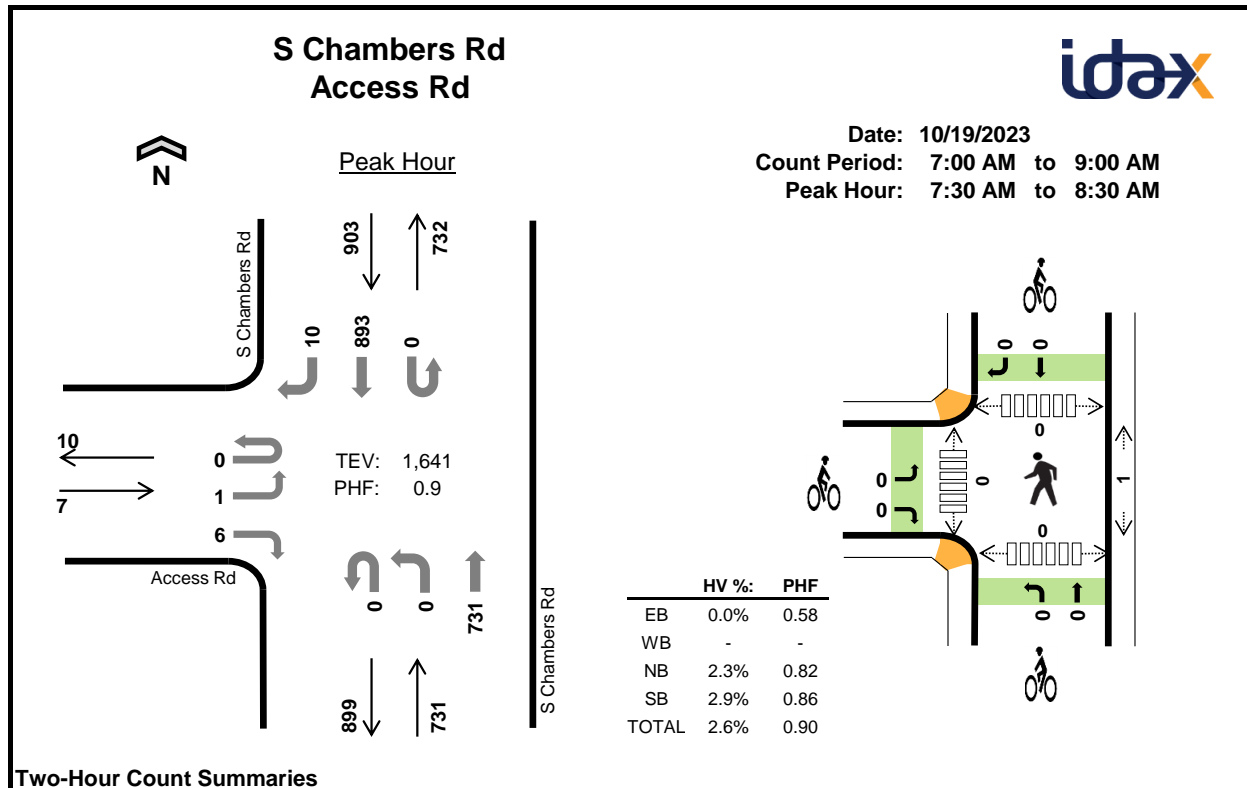
**Two-Hour Count Summaries - Heavy Vehicles**

Interval Start	E Smoky Hill Rd				E Smoky Hill Rd				N/A				Access 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	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0
4:15 PM	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	5	0
4:30 PM	0	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	4	0
4:45 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	13
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
5:15 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	2	8
5:30 PM	0	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	5	9
5:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	8
Count Total	0	0	5	0	0	0	16	0	0	0	0	0	0	0	0	0	21	0
Peak Hour	0	0	3	0	0	0	10	0	0	0	0	0	0	0	0	0	13	0

**Two-Hour Count Summaries - Bikes**

Interval Start	E Smoky Hill Rd			E Smoky Hill Rd			N/A			Access 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	1	0	0	0	0	0	0	0	1	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	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1
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	1	0	0	0	0	0	0	0	1	0
Peak Hour	0	0	0	0	1	0	0	0	0	0	0	0	1	0

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

**Two-Hour Count Summaries**

Interval Start		Access Rd				N/A				S Chambers Rd				S Chambers 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	0	0	0	0	0	0	0	0	0	147	0	0	0	173	0	320	0
7:15 AM		0	0	0	0	0	0	0	0	0	0	170	0	0	0	165	1	336	0
7:30 AM		0	0	0	0	0	0	0	0	0	0	193	0	0	0	261	1	455	0
7:45 AM		0	0	0	3	0	0	0	0	0	0	223	0	0	0	225	4	455	1,566
8:00 AM		0	0	0	1	0	0	0	0	0	0	154	0	0	0	214	3	372	1,618
8:15 AM		0	1	0	2	0	0	0	0	0	0	161	0	0	0	193	2	359	1,641
8:30 AM		0	0	0	3	0	0	0	0	0	0	148	0	0	0	197	0	348	1,534
8:45 AM		0	0	0	1	0	0	0	0	0	0	164	0	0	0	224	4	393	1,472
Count Total		0	1	0	10	0	0	0	0	0	0	1,360	0	0	0	1,652	15	3,038	0
Peak Hour	All	0	1	0	6	0	0	0	0	0	0	731	0	0	0	893	10	1,641	0
	HV	0	0	0	0	0	0	0	0	0	0	17	0	0	0	26	0	43	0
	HV%	-	0%	-	0%	-	-	-	-	-	-	2%	-	-	-	3%	0%	3%	0

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

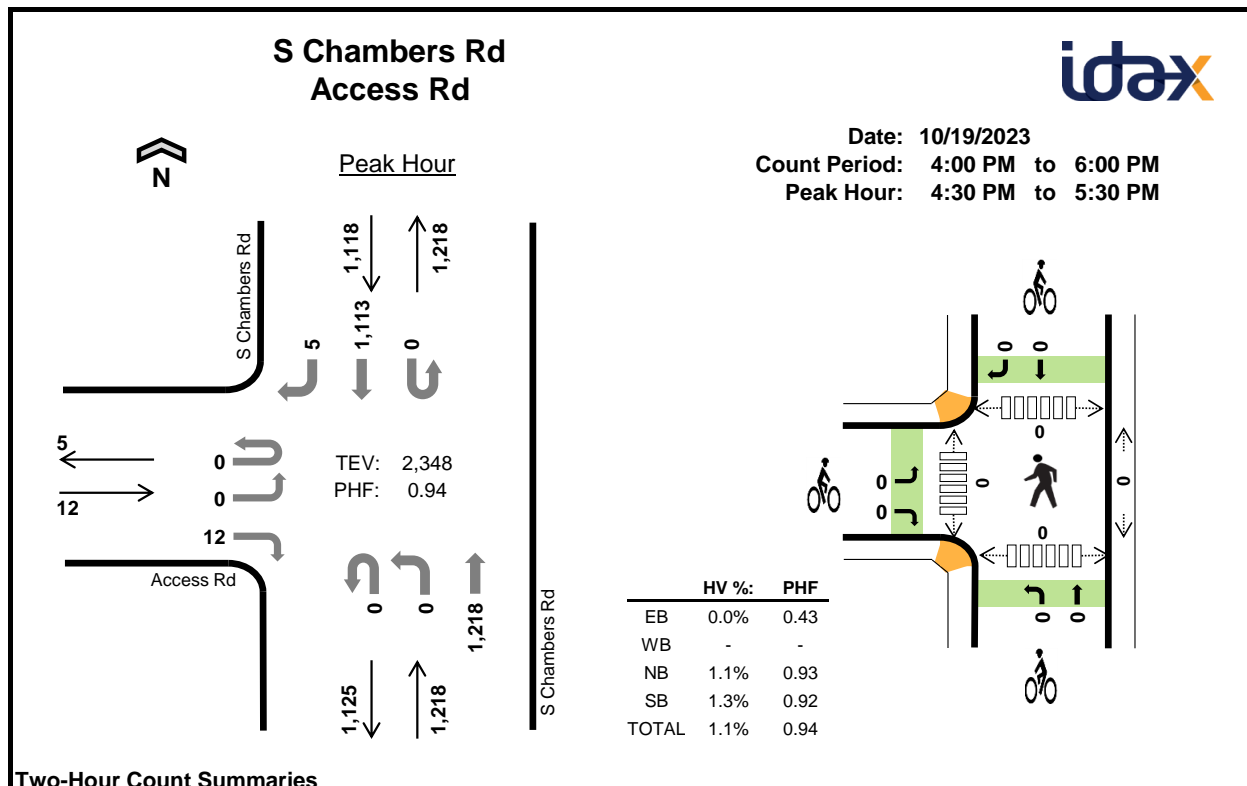
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	5	6	11	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	5	6	11	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	5	6	11	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	4	6	10	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	3	8	11	0	0	0	0	0	1	0	0	0	1
8:30 AM	0	0	4	6	10	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	5	6	11	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	32	46	78	0	0	0	0	0	1	0	0	0	1
Peak Hr	0	0	17	26	43	0	0	0	0	0	1	0	0	0	1

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	Access Rd				N/A				S Chambers Rd				S Chambers 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	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	3	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	6	0	11	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	6	0	11	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	6	0	11	36
8:00 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	6	0	10	43
8:15 AM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	8	0	11	43
8:30 AM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	6	0	10	42
8:45 AM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	6	0	11	42
Count Total	0	0	0	0	0	0	0	0	0	0	32	0	0	0	46	0	78	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	17	0	0	0	26	0	43	0

Two-Hour Count Summaries - Bikes																		
Interval Start	Access Rd				N/A				S Chambers Rd				S Chambers 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		Access Rd				N/A				S Chambers Rd				S Chambers 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	0	0	4	0	0	0	0	0	0	279	0	0	0	256	5	544	0
4:15 PM		0	0	0	6	0	0	0	0	0	0	279	0	0	0	253	3	541	0
4:30 PM		0	0	0	0	0	0	0	0	0	0	275	0	0	0	303	2	580	0
4:45 PM		0	0	0	7	0	0	0	0	0	0	327	0	0	0	289	3	626	2,291
5:00 PM		0	0	0	2	0	0	0	0	0	0	312	0	0	0	235	0	549	2,296
5:15 PM		0	0	0	3	0	0	0	0	0	0	304	0	0	0	286	0	593	2,348
5:30 PM		0	2	0	0	0	0	0	0	0	0	304	0	0	0	239	1	546	2,314
5:45 PM		0	0	0	0	0	0	0	0	0	0	300	0	0	0	251	2	553	2,241
Count Total		0	2	0	22	0	0	0	0	0	0	2,380	0	0	0	2,112	16	4,532	0
Peak Hour	All	0	0	0	12	0	0	0	0	0	0	1,218	0	0	0	1,113	5	2,348	0
	HV	0	0	0	0	0	0	0	0	0	0	13	0	0	0	14	0	27	0
	HV%	-	-	-	0%	-	-	-	-	-	-	1%	-	-	-	1%	0%	1%	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	0	0	7	2	9	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	4	3	7	0	0	0	1	1	0	0	0	0	0
4:30 PM	0	0	3	6	9	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	3	3	6	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	5	1	6	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	2	4	6	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	4	3	7	0	0	0	0	0	2	0	0	0	2
5:45 PM	0	0	3	1	4	0	0	0	0	0	2	0	0	0	2
Count Total	0	0	31	23	54	0	0	0	1	1	4	0	0	0	4
Peak Hr	0	0	13	14	27	0	0	0	0	0	0	0	0	0	0

Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	Access Rd				N/A				S Chambers Rd				S Chambers 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	0	0	0	0	0	0	0	0	0	7	0	0	0	2	0	9	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	3	0	7	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	6	0	9	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	6	31
5:00 PM	0	0	0	0	0	0	0	0	0	0	5	0	0	0	1	0	6	28
5:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	4	0	6	27
5:30 PM	0	0	0	0	0	0	0	0	0	0	4	0	0	0	3	0	7	25
5:45 PM	0	0	0	0	0	0	0	0	0	0	3	0	0	0	1	0	4	23
Count Total	0	0	0	0	0	0	0	0	0	0	31	0	0	0	23	0	54	0
Peak Hour	0	0	0	0	0	0	0	0	0	0	13	0	0	0	14	0	27	0

Two-Hour Count Summaries - Bikes																		
Interval Start	Access Rd				N/A				S Chambers Rd				S Chambers 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	1	0		1	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	1
5:00 PM	0	0	0		0	0	0		0	0	0		0	0	0		0	1
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	1	0		1	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.

# APPENDIX B

## Future Traffic Projections

DRCOG Traffic Projections:      QuikTrip 4274

Location	2020	2050	Growth Factor	Annual Growth
Smoky Hill W/O Chambers	30,000	37,000	1.23	0.70%
Smoky Hill E/O Chambers	41,000	51,000	1.24	0.73%
Chambers N/O Smoky Hill	42,000	54,000	1.29	0.84%
Chambers S/O Smoky Hill	38,000	48,000	1.26	0.78%
Total	151,000	190,000	1.26	0.77%



# APPENDIX C

## Trip Generation Worksheets

Project QuikTrip 4274  
 Subject Trip Generation for Convenience Store/Gas Station - VFP (9-15)  
 Designed by MAG Date November 02, 2023 Job No. 096888040  
 Checked by \_\_\_\_\_ Date \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

## **TRIP GENERATION MANUAL TECHNIQUES**

ITE Trip Generation Manual 11th Edition, Average Rate Equations

Land Use Code - Convenience Store/Gas Station - GFA (4-5.5K) (945)

Independent Variable - Vehicle Fueling Positions (X)

Vehicle Fueling Positions= 14 Positions

X = 14

T = Average Vehicle Trip Ends

### **Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Page 873)**

Average Weekday	Directional Distribution:	50% ent.	50% exit.
T = 27.04 (X)	T = 379	Average Vehicle Trip Ends	
T = 27.04 * 14	189 entering	190 exiting	
	189 + 190 = 379		

### **Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (Page 874)**

Average Weekday	Directional Distribution:	50% ent.	50% exit.
T = 22.76 (X)	T = 319	Average Vehicle Trip Ends	
T = 22.76 * 14.000	159 entering	160 exiting	
	159 + 160 = 319		

### **Weekday (Page 872)**

Average Weekday	Directional Distribution:	50% entering,	50% exiting
T = 257.13 (X)	T = 3600	Average Vehicle Trip Ends	
T = 257.13 * 14.000	1800 entering	1800 exiting	
	1800 + 1800 = 3600		

### **Non Pass-By Trip Volumes (Per ITE Trip Generation Manual, 11th Edition)**

PM Peak Hour = 25% Non-Pass By	AM Peak Hour = 24% Non-Pass By
IN Out Total	
AM Peak 45 46 91	
PM Peak 40 40 80	
Daily 450 450 900	PM Peak Hour Rate Applied to Daily

### **Pass-By Trip Volumes (Per ITE Trip Generation Manual, 11th Edition)**

PM Peak Hour = 75% Pass By	AM Peak Hour = 76% Pass By
IN Out Total	
AM Peak 144 144 288	
PM Peak 119 120 239	
Daily 1350 1350 2700	PM Peak Hour Rate Applied to Daily

# APPENDIX D

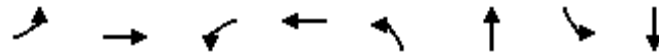
## Intersection Analysis Worksheets

# Timings

## 1: Chambers Road & Smoky Hill Road

2023 Existing AM

11/03/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	46	325	91	561	13	436	158	723
Future Volume (vph)	46	325	91	561	13	436	158	723
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	24.0	9.5	24.0	9.5	24.0
Total Split (s)	16.0	53.0	19.0	56.0	13.0	51.0	17.0	55.0
Total Split (%)	11.4%	37.9%	13.6%	40.0%	9.3%	36.4%	12.1%	39.3%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max

### Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

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

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Chambers Road & Smoky Hill Road

Ø1	Ø2 (R)	Ø3	Ø4
17 s	51 s	19 s	53 s
Ø5	Ø6 (R)	Ø7	Ø8
13 s	55 s	16 s	56 s

































# HCM 6th Signalized Intersection Summary

2023 Existing AM

## 1: Chambers Road & Smoky Hill Road

11/03/2023

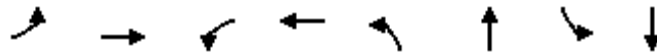
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			  		 	  	
Traffic Volume (veh/h)	46	325	66	91	561	259	13	436	37	158	723	25
Future Volume (veh/h)	46	325	66	91	561	259	13	436	37	158	723	25
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	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	1856	1856	1856	1870	1870	1870	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	47	335	68	94	578	267	13	449	38	163	745	26
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	2	2	2	4	4	4	3	3	3
Cap, veh/h	143	834	164	272	762	343	428	2659	222	1130	2939	102
Arrive On Green	0.03	0.20	0.20	0.05	0.22	0.22	0.01	0.56	0.56	0.04	0.58	0.58
Sat Flow, veh/h	1767	4249	833	1781	3445	1550	1753	4725	395	3428	5026	175
Grp Volume(v), veh/h	47	264	139	94	571	274	13	317	170	163	500	271
Grp Sat Flow(s),veh/h/ln	1767	1689	1706	1781	1702	1591	1753	1675	1770	1714	1689	1824
Q Serve(g_s), s	3.0	9.5	10.0	5.8	22.0	22.7	0.4	6.4	6.5	2.8	10.1	10.1
Cycle Q Clear(g_c), s	3.0	9.5	10.0	5.8	22.0	22.7	0.4	6.4	6.5	2.8	10.1	10.1
Prop In Lane	1.00		0.49	1.00		0.97	1.00		0.22	1.00		0.10
Lane Grp Cap(c), veh/h	143	663	335	272	753	352	428	1885	996	1130	1975	1067
V/C Ratio(X)	0.33	0.40	0.42	0.35	0.76	0.78	0.03	0.17	0.17	0.14	0.25	0.25
Avail Cap(c_a), veh/h	235	1134	573	359	1216	568	510	1885	996	1312	1975	1067
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	49.1	49.2	41.1	51.0	51.3	12.8	14.8	14.8	11.8	14.2	14.2
Incr Delay (d2), s/veh	1.3	0.4	0.8	0.8	1.6	3.8	0.0	0.2	0.4	0.1	0.3	0.6
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	1.4	4.1	4.4	2.6	9.6	9.4	0.2	2.5	2.8	1.1	4.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.8	49.4	50.1	41.9	52.6	55.1	12.8	15.0	15.2	11.8	14.5	14.8
LnGrp LOS	D	D	D	D	D	E	B	B	B	B	B	B
Approach Vol, veh/h	450			939			500			934		
Approach Delay, s/veh	49.3			52.3			15.0			14.1		
Approach LOS	D			D			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.6	84.8	12.2	33.5	6.5	87.9	8.7	37.0				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	12.5	45.0	14.5	47.0	8.5	49.0	11.5	50.0				
Max Q Clear Time (g_c+I1), s	4.8	8.5	7.8	12.0	2.4	12.1	5.0	24.7				
Green Ext Time (p_c), s	0.3	3.4	0.1	2.8	0.0	5.8	0.0	6.3				
Intersection Summary												
HCM 6th Ctrl Delay	32.6											
HCM 6th LOS	C											

# Timings

## 1: Chambers Road & Smoky Hill Road

2023 Existing PM

11/03/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	54	588	152	550	75	958	332	685
Future Volume (vph)	54	588	152	550	75	958	332	685
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	24.0	9.5	24.0	9.5	24.0
Total Split (s)	12.0	35.0	24.0	47.0	12.0	57.0	24.0	69.0
Total Split (%)	8.6%	25.0%	17.1%	33.6%	8.6%	40.7%	17.1%	49.3%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max

### Intersection Summary

Cycle Length: 140

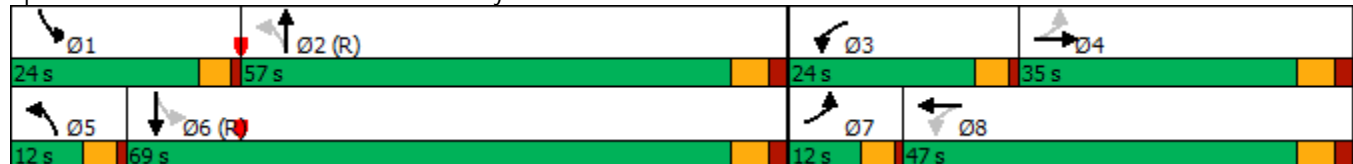
Actuated Cycle Length: 140

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

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Chambers Road & Smoky Hill Road
































# HCM 6th Signalized Intersection Summary

## 1: Chambers Road & Smoky Hill Road

2023 Existing PM

11/03/2023

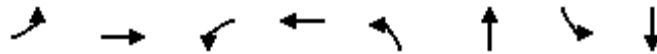
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			  			  	
Traffic Volume (veh/h)	54	588	44	152	550	218	75	958	144	332	685	59
Future Volume (veh/h)	54	588	44	152	550	218	75	958	144	332	685	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	59	646	48	167	604	240	82	1053	158	365	753	65
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	156	799	59	241	791	307	431	2359	353	677	2680	230
Arrive On Green	0.04	0.16	0.16	0.09	0.22	0.22	0.03	0.53	0.53	0.07	0.56	0.56
Sat Flow, veh/h	1781	4852	358	1781	3617	1405	1781	4482	672	3456	4789	411
Grp Volume(v), veh/h	59	452	242	167	568	276	82	799	412	365	534	284
Grp Sat Flow(s),veh/h/ln	1781	1702	1806	1781	1702	1618	1781	1702	1749	1728	1702	1796
Q Serve(g_s), s	3.8	17.9	18.1	10.6	21.9	22.5	3.0	20.4	20.4	6.5	11.5	11.6
Cycle Q Clear(g_c), s	3.8	17.9	18.1	10.6	21.9	22.5	3.0	20.4	20.4	6.5	11.5	11.6
Prop In Lane	1.00		0.20	1.00		0.87	1.00		0.38	1.00		0.23
Lane Grp Cap(c), veh/h	156	561	298	241	744	354	431	1791	921	677	1905	1005
V/C Ratio(X)	0.38	0.81	0.81	0.69	0.76	0.78	0.19	0.45	0.45	0.54	0.28	0.28
Avail Cap(c_a), veh/h	184	705	374	326	997	474	466	1791	921	925	1905	1005
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.0	56.3	56.4	43.0	51.3	51.6	14.4	20.5	20.5	15.0	16.1	16.1
Incr Delay (d2), s/veh	1.5	5.5	10.5	3.9	2.5	6.0	0.2	0.8	1.6	0.7	0.4	0.7
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	1.8	8.1	9.1	4.9	9.6	9.8	1.2	8.3	8.8	2.6	4.6	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.5	61.8	66.9	46.8	53.8	57.5	14.6	21.3	22.1	15.7	16.5	16.8
LnGrp LOS	D	E	E	D	D	E	B	C	C	B	B	B
Approach Vol, veh/h	753		1011				1293		1183			
Approach Delay, s/veh	62.4		53.7				21.2		16.3			
Approach LOS	E		D				C		B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	79.7	17.3	29.1	9.3	84.4	9.8	36.6				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	19.5	51.0	19.5	29.0	7.5	63.0	7.5	41.0				
Max Q Clear Time (g_c+I1), s	8.5	22.4	12.6	20.1	5.0	13.6	5.8	24.5				
Green Ext Time (p_c), s	1.0	9.9	0.2	3.0	0.0	6.5	0.0	5.3				
Intersection Summary												
HCM 6th Ctrl Delay	34.9											
HCM 6th LOS	C											

# Timings

2026 Background AM

11/08/2023

## 1: Chambers Road & Smoky Hill Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	47	333	93	574	13	446	162	740
Future Volume (vph)	47	333	93	574	13	446	162	740
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	24.0	9.5	24.0	9.5	24.0
Total Split (s)	16.0	52.0	20.0	56.0	12.0	51.0	17.0	56.0
Total Split (%)	11.4%	37.1%	14.3%	40.0%	8.6%	36.4%	12.1%	40.0%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max

### Intersection Summary

Cycle Length: 140

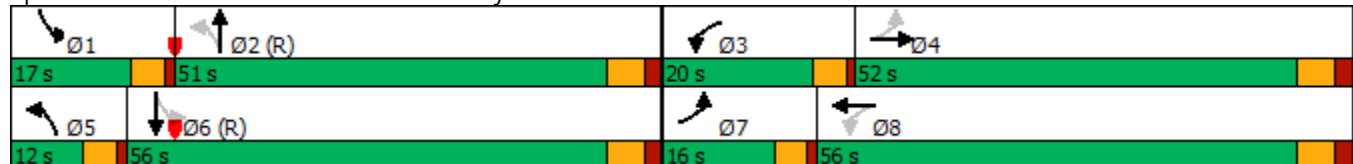
Actuated Cycle Length: 140

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

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Chambers Road & Smoky Hill Road


























# HCM 6th Signalized Intersection Summary

## 1: Chambers Road & Smoky Hill Road

2026 Background AM

11/08/2023

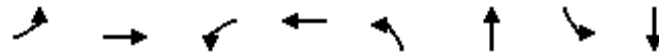
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	47	333	68	93	574	265	13	446	38	162	740	26
Future Volume (veh/h)	47	333	68	93	574	265	13	446	38	162	740	26
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	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	1856	1856	1856	1870	1870	1870	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	48	343	70	96	592	273	13	460	39	167	763	27
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	2	2	2	4	4	4	3	3	3
Cap, veh/h	143	850	168	275	777	350	417	2632	220	1109	2912	103
Arrive On Green	0.03	0.20	0.20	0.06	0.23	0.23	0.01	0.56	0.56	0.04	0.58	0.58
Sat Flow, veh/h	1767	4244	837	1781	3445	1550	1753	4724	396	3428	5023	177
Grp Volume(v), veh/h	48	270	143	96	585	280	13	325	174	167	512	278
Grp Sat Flow(s),veh/h/ln	1767	1689	1705	1781	1702	1591	1753	1675	1769	1714	1689	1824
Q Serve(g_s), s	3.0	9.7	10.2	5.9	22.5	23.2	0.4	6.7	6.8	2.9	10.5	10.6
Cycle Q Clear(g_c), s	3.0	9.7	10.2	5.9	22.5	23.2	0.4	6.7	6.8	2.9	10.5	10.6
Prop In Lane	1.00		0.49	1.00		0.97	1.00		0.22	1.00		0.10
Lane Grp Cap(c), veh/h	143	677	342	275	768	359	417	1866	986	1109	1958	1057
V/C Ratio(X)	0.33	0.40	0.42	0.35	0.76	0.78	0.03	0.17	0.18	0.15	0.26	0.26
Avail Cap(c_a), veh/h	235	1110	560	373	1216	568	486	1866	986	1289	1958	1057
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	48.7	48.8	40.6	50.7	51.0	13.2	15.2	15.2	12.1	14.6	14.6
Incr Delay (d2), s/veh	1.4	0.4	0.8	0.8	1.6	3.7	0.0	0.2	0.4	0.1	0.3	0.6
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	1.4	4.2	4.5	2.7	9.8	9.6	0.2	2.6	2.9	1.1	4.2	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	49.0	49.7	41.4	52.3	54.7	13.2	15.4	15.6	12.1	14.9	15.2
LnGrp LOS	D	D	D	D	D	D	B	B	B	B	B	B
Approach Vol, veh/h	461			961			512			957		
Approach Delay, s/veh	48.9			51.9			15.4			14.5		
Approach LOS	D			D			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.7	84.0	12.3	34.1	6.5	87.2	8.8	37.6				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	12.5	45.0	15.5	46.0	7.5	50.0	11.5	50.0				
Max Q Clear Time (g_c+I1), s	4.9	8.8	7.9	12.2	2.4	12.6	5.0	25.2				
Green Ext Time (p_c), s	0.3	3.5	0.1	2.9	0.0	6.0	0.0	6.4				
Intersection Summary												
HCM 6th Ctrl Delay	32.6											
HCM 6th LOS	C											

# Timings

## 1: Chambers Road & Smoky Hill Road

2026 Background PM

11/08/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↰	↑↑↑	↰	↑↑↑	↰	↑↑↑	↰	↑↑↑
Traffic Volume (vph)	55	602	156	563	77	980	340	701
Future Volume (vph)	55	602	156	563	77	980	340	701
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	24.0	9.5	24.0	9.5	24.0
Total Split (s)	12.0	34.0	25.0	47.0	13.0	56.0	25.0	68.0
Total Split (%)	8.6%	24.3%	17.9%	33.6%	9.3%	40.0%	17.9%	48.6%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max

### Intersection Summary

Cycle Length: 140

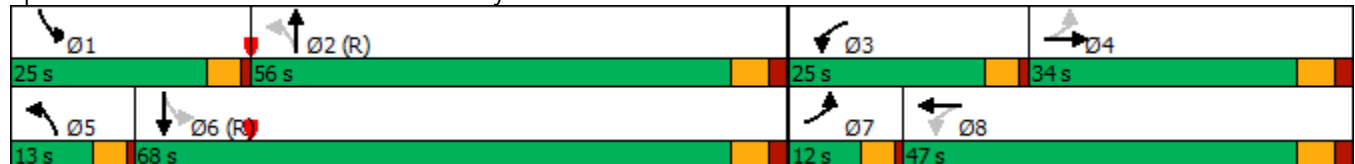
Actuated Cycle Length: 140

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

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Chambers Road & Smoky Hill Road
























# HCM 6th Signalized Intersection Summary

## 1: Chambers Road & Smoky Hill Road

2026 Background PM

11/08/2023

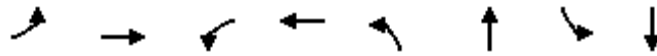
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	602	45	156	563	223	77	980	147	340	701	60
Future Volume (veh/h)	55	602	45	156	563	223	77	980	147	340	701	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	60	662	49	171	619	245	85	1077	162	374	770	66
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	155	807	59	242	801	310	423	2333	351	666	2660	227
Arrive On Green	0.04	0.17	0.17	0.09	0.22	0.22	0.04	0.52	0.52	0.07	0.56	0.56
Sat Flow, veh/h	1781	4853	357	1781	3620	1402	1781	4480	673	3456	4792	409
Grp Volume(v), veh/h	60	463	248	171	581	283	85	818	421	374	546	290
Grp Sat Flow(s),veh/h/ln	1781	1702	1806	1781	1702	1618	1781	1702	1749	1728	1702	1797
Q Serve(g_s), s	3.9	18.4	18.6	10.8	22.5	23.1	3.1	21.2	21.3	6.7	11.9	12.0
Cycle Q Clear(g_c), s	3.9	18.4	18.6	10.8	22.5	23.1	3.1	21.2	21.3	6.7	11.9	12.0
Prop In Lane	1.00		0.20	1.00		0.87	1.00		0.38	1.00		0.23
Lane Grp Cap(c), veh/h	155	566	300	242	753	358	423	1773	911	666	1890	997
V/C Ratio(X)	0.39	0.82	0.83	0.71	0.77	0.79	0.20	0.46	0.46	0.56	0.29	0.29
Avail Cap(c_a), veh/h	183	681	361	337	997	474	468	1773	911	930	1890	997
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.8	56.3	56.4	42.8	51.2	51.4	14.7	21.2	21.2	15.6	16.5	16.5
Incr Delay (d2), s/veh	1.6	6.6	12.5	4.0	2.7	6.5	0.2	0.9	1.7	0.7	0.4	0.7
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	1.8	8.4	9.5	5.1	9.9	10.0	1.3	8.7	9.1	2.7	4.8	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.4	62.9	68.9	46.7	53.9	57.9	14.9	22.0	22.9	16.4	16.9	17.3
LnGrp LOS	D	E	E	D	D	E	B	C	C	B	B	B
Approach Vol, veh/h		771			1035			1324			1210	
Approach Delay, s/veh		63.7			53.8			21.8			16.8	
Approach LOS		E			D			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.3	78.9	17.5	29.3	9.5	83.7	9.8	37.0				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	20.5	50.0	20.5	28.0	8.5	62.0	7.5	41.0				
Max Q Clear Time (g_c+I1), s	8.7	23.3	12.8	20.6	5.1	14.0	5.9	25.1				
Green Ext Time (p_c), s	1.1	10.0	0.3	2.7	0.0	6.7	0.0	5.3				
Intersection Summary												
HCM 6th Ctrl Delay			35.5									
HCM 6th LOS			D									

# Timings

## 1: Chambers Road & Smoky Hill Road

2026 Total AM

04/26/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	98	318	89	604	48	423	190	759
Future Volume (vph)	98	318	89	604	48	423	190	759
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	24.0	9.5	24.0	9.5	24.0
Total Split (s)	21.0	57.0	16.0	52.0	15.0	51.0	16.0	52.0
Total Split (%)	15.0%	40.7%	11.4%	37.1%	10.7%	36.4%	11.4%	37.1%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max

### Intersection Summary

Cycle Length: 140

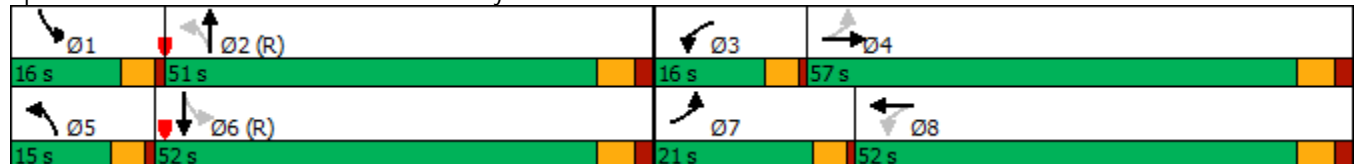
Actuated Cycle Length: 140

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

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Chambers Road & Smoky Hill Road



# HCM 6th Signalized Intersection Summary

2026 Total AM

## 1: Chambers Road & Smoky Hill Road

04/26/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑		↰	↑↑↑		↰	↑↑↑		↰	↑↑↑	
Traffic Volume (veh/h)	98	318	65	89	604	251	48	423	37	190	759	25
Future Volume (veh/h)	98	318	65	89	604	251	48	423	37	190	759	25
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	1856	1856	1856	1870	1870	1870	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	101	328	67	92	623	259	49	436	38	196	782	26
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	2	2	2	4	4	4	3	3	3
Cap, veh/h	189	981	194	307	806	328	404	2468	212	1089	2699	90
Arrive On Green	0.06	0.23	0.23	0.05	0.23	0.23	0.03	0.52	0.52	0.04	0.54	0.54
Sat Flow, veh/h	1767	4245	837	1781	3563	1450	1753	4712	405	3428	5035	167
Grp Volume(v), veh/h	101	259	136	92	595	287	49	308	166	196	524	284
Grp Sat Flow(s),veh/h/ln	1767	1689	1705	1781	1702	1609	1753	1675	1768	1714	1689	1825
Q Serve(g_s), s	6.1	8.9	9.4	5.5	22.9	23.6	1.8	6.8	6.9	3.7	11.9	12.0
Cycle Q Clear(g_c), s	6.1	8.9	9.4	5.5	22.9	23.6	1.8	6.8	6.9	3.7	11.9	12.0
Prop In Lane	1.00		0.49	1.00		0.90	1.00		0.23	1.00		0.09
Lane Grp Cap(c), veh/h	189	781	394	307	770	364	404	1754	926	1089	1810	978
V/C Ratio(X)	0.53	0.33	0.35	0.30	0.77	0.79	0.12	0.18	0.18	0.18	0.29	0.29
Avail Cap(c_a), veh/h	296	1230	621	360	1118	529	482	1754	926	1224	1810	978
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.5	44.8	45.0	38.7	50.8	51.0	14.7	17.5	17.5	14.2	17.8	17.9
Incr Delay (d2), s/veh	2.3	0.2	0.5	0.5	2.1	5.0	0.1	0.2	0.4	0.1	0.4	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	2.8	3.8	4.1	2.5	10.0	10.0	0.7	2.7	3.0	1.5	4.8	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.8	45.1	45.5	39.2	52.9	56.0	14.9	17.7	17.9	14.2	18.2	18.6
LnGrp LOS	D	D	D	D	D	E	B	B	B	B	B	B
Approach Vol, veh/h	496		974				523		1004			
Approach Delay, s/veh	44.7		52.5				17.5		17.6			
Approach LOS	D		D				B		B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.5	79.3	11.9	38.4	8.8	81.0	12.5	37.7				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	11.5	45.0	11.5	51.0	10.5	46.0	16.5	46.0				
Max Q Clear Time (g_c+I1), s	5.7	8.9	7.5	11.4	3.8	14.0	8.1	25.6				
Green Ext Time (p_c), s	0.3	3.3	0.1	2.8	0.0	6.0	0.1	6.1				

### Intersection Summary

HCM 6th Ctrl Delay	33.4
HCM 6th LOS	C

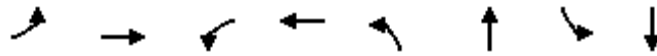


# Timings

## 1: Chambers Road & Smoky Hill Road

2026 Total PM

04/26/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	104	586	151	585	122	950	371	717
Future Volume (vph)	104	586	151	585	122	950	371	717
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	24.0	9.5	24.0	9.5	24.0
Total Split (s)	18.0	34.0	24.0	40.0	18.0	55.0	27.0	64.0
Total Split (%)	12.9%	24.3%	17.1%	28.6%	12.9%	39.3%	19.3%	45.7%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max

### Intersection Summary

Cycle Length: 140

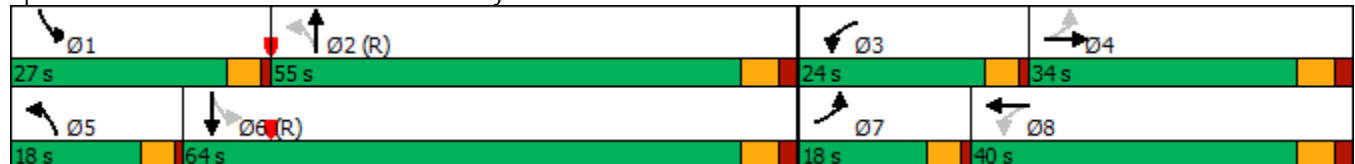
Actuated Cycle Length: 140

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

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Chambers Road & Smoky Hill Road



# HCM 6th Signalized Intersection Summary

2026 Total PM

## 1: Chambers Road & Smoky Hill Road

04/26/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑↑		↰	↑↑↑		↰	↑↑↑		↰	↑↑↑	
Traffic Volume (veh/h)	104	586	44	151	585	216	122	950	142	371	717	59
Future Volume (veh/h)	104	586	44	151	585	216	122	950	142	371	717	59
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	644	48	166	643	237	134	1044	156	408	788	65
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	193	903	67	257	778	281	421	2223	332	684	2512	206
Arrive On Green	0.07	0.19	0.19	0.09	0.21	0.21	0.05	0.50	0.50	0.08	0.52	0.52
Sat Flow, veh/h	1781	4851	359	1781	3697	1337	1781	4485	669	3456	4809	395
Grp Volume(v), veh/h	114	451	241	166	591	289	134	792	408	408	557	296
Grp Sat Flow(s),veh/h/ln	1781	1702	1806	1781	1702	1630	1781	1702	1750	1728	1702	1799
Q Serve(g_s), s	7.2	17.4	17.6	10.3	23.2	23.8	5.2	21.4	21.5	7.8	13.1	13.2
Cycle Q Clear(g_c), s	7.2	17.4	17.6	10.3	23.2	23.8	5.2	21.4	21.5	7.8	13.1	13.2
Prop In Lane	1.00		0.20	1.00		0.82	1.00		0.38	1.00		0.22
Lane Grp Cap(c), veh/h	193	633	336	257	716	343	421	1687	867	684	1778	940
V/C Ratio(X)	0.59	0.71	0.72	0.65	0.83	0.84	0.32	0.47	0.47	0.60	0.31	0.32
Avail Cap(c_a), veh/h	249	681	361	345	827	396	500	1687	867	968	1778	940
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.7	53.4	53.5	41.3	52.8	53.1	15.9	23.2	23.2	17.1	19.1	19.1
Incr Delay (d2), s/veh	2.9	3.2	6.2	2.7	6.1	13.6	0.4	0.9	1.8	0.8	0.5	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	7.8	8.6	4.8	10.6	11.1	2.2	8.9	9.3	3.1	5.3	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.6	56.7	59.8	44.1	58.9	66.6	16.3	24.2	25.1	18.0	19.6	20.0
LnGrp LOS	D	E	E	D	E	E	B	C	C	B	B	B
Approach Vol, veh/h		806			1046			1334			1261	
Approach Delay, s/veh		56.2			58.7			23.6			19.1	
Approach LOS		E			E			C			B	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.5	75.4	17.0	32.1	11.8	79.1	13.6	35.4				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	22.5	49.0	19.5	28.0	13.5	58.0	13.5	34.0				
Max Q Clear Time (g_c+I1), s	9.8	23.5	12.3	19.6	7.2	15.2	9.2	25.8				
Green Ext Time (p_c), s	1.2	9.4	0.2	2.9	0.2	6.8	0.1	3.6				

### Intersection Summary

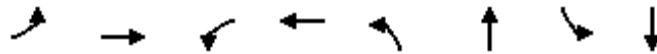
HCM 6th Ctrl Delay	36.5
HCM 6th LOS	D

# Timings

2050 Background AM

11/08/2023

## 1: Chambers Road & Smoky Hill Road



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↰	↑↑↑	↰	↑↑↑	↰	↑↑↑	↰	↑↑↑
Traffic Volume (vph)	57	400	112	690	16	536	194	889
Future Volume (vph)	57	400	112	690	16	536	194	889
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	24.0	9.5	24.0	9.5	24.0
Total Split (s)	15.0	52.0	19.0	56.0	12.0	52.0	17.0	57.0
Total Split (%)	10.7%	37.1%	13.6%	40.0%	8.6%	37.1%	12.1%	40.7%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max

### Intersection Summary

Cycle Length: 140

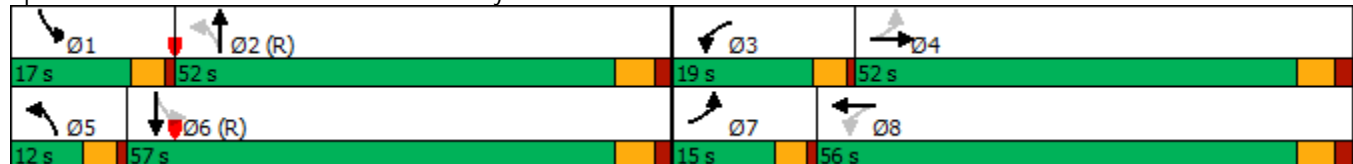
Actuated Cycle Length: 140

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

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Chambers Road & Smoky Hill Road
























# HCM 6th Signalized Intersection Summary

## 1: Chambers Road & Smoky Hill Road

2050 Background AM

11/08/2023

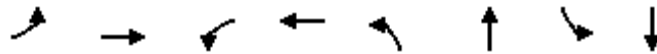
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	57	400	81	112	690	319	16	536	46	194	889	31
Future Volume (veh/h)	57	400	81	112	690	319	16	536	46	194	889	31
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		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	1856	1856	1856	1870	1870	1870	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	59	412	84	115	711	329	16	553	47	200	916	32
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	2	2	2	4	4	4	3	3	3
Cap, veh/h	151	1004	199	299	902	412	331	2395	202	949	2687	94
Arrive On Green	0.04	0.24	0.24	0.06	0.26	0.26	0.02	0.51	0.51	0.04	0.53	0.53
Sat Flow, veh/h	1767	4241	840	1781	3427	1566	1753	4722	397	3428	5026	175
Grp Volume(v), veh/h	59	326	170	115	706	334	16	391	209	200	615	333
Grp Sat Flow(s),veh/h/ln	1767	1689	1704	1781	1702	1588	1753	1675	1769	1714	1689	1824
Q Serve(g_s), s	3.5	11.4	11.9	6.7	27.0	27.4	0.6	9.1	9.3	3.8	14.5	14.5
Cycle Q Clear(g_c), s	3.5	11.4	11.9	6.7	27.0	27.4	0.6	9.1	9.3	3.8	14.5	14.5
Prop In Lane	1.00		0.49	1.00		0.99	1.00		0.22	1.00		0.10
Lane Grp Cap(c), veh/h	151	799	403	299	896	418	331	1699	897	949	1805	975
V/C Ratio(X)	0.39	0.41	0.42	0.38	0.79	0.80	0.05	0.23	0.23	0.21	0.34	0.34
Avail Cap(c_a), veh/h	220	1110	560	373	1216	567	396	1699	897	1104	1805	975
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.6	45.1	45.3	36.6	47.9	48.1	16.4	19.2	19.3	14.8	18.5	18.6
Incr Delay (d2), s/veh	1.7	0.3	0.7	0.8	2.5	5.7	0.1	0.3	0.6	0.1	0.5	1.0
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	1.6	4.9	5.2	3.0	11.8	11.5	0.3	3.7	4.0	1.5	5.9	6.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.2	45.5	46.0	37.4	50.4	53.8	16.5	19.6	19.9	14.9	19.1	19.5
LnGrp LOS	D	D	D	D	D	D	B	B	B	B	B	B
Approach Vol, veh/h	555		1155			616			1148			
Approach Delay, s/veh	45.3		50.1			19.6			18.5			
Approach LOS	D		D			B			B			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	10.6	77.0	13.2	39.1	6.8	80.8	9.5	42.9				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	12.5	46.0	14.5	46.0	7.5	51.0	10.5	50.0				
Max Q Clear Time (g_c+I1), s	5.8	11.3	8.7	13.9	2.6	16.5	5.5	29.4				
Green Ext Time (p_c), s	0.3	4.3	0.1	3.5	0.0	7.5	0.0	7.4				
Intersection Summary												
HCM 6th Ctrl Delay			33.5									
HCM 6th LOS			C									

# Timings

## 1: Chambers Road & Smoky Hill Road

2050 Background PM

11/08/2023



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	↑↑↑	←	↑↑↑	←	↑↑↑	←	↑↑↑
Traffic Volume (vph)	66	723	187	677	92	1178	408	843
Future Volume (vph)	66	723	187	677	92	1178	408	843
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	24.0	9.5	24.0	9.5	24.0
Total Split (s)	14.0	34.0	25.0	45.0	14.2	56.0	25.0	66.8
Total Split (%)	10.0%	24.3%	17.9%	32.1%	10.1%	40.0%	17.9%	47.7%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max

### Intersection Summary

Cycle Length: 140

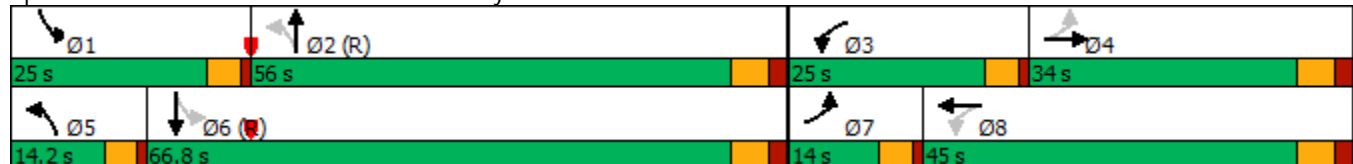
Actuated Cycle Length: 140

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

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 1: Chambers Road & Smoky Hill Road


























# HCM 6th Signalized Intersection Summary

2050 Background PM

## 1: Chambers Road & Smoky Hill Road

11/08/2023

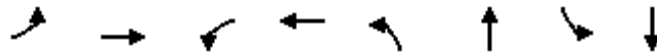
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	66	723	54	187	677	268	92	1178	177	408	843	73
Future Volume (veh/h)	66	723	54	187	677	268	92	1178	177	408	843	73
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	73	795	59	205	744	295	101	1295	195	448	926	80
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	159	909	67	258	898	352	350	2104	317	577	2457	212
Arrive On Green	0.04	0.19	0.19	0.11	0.25	0.25	0.04	0.47	0.47	0.09	0.51	0.51
Sat Flow, veh/h	1781	4851	359	1781	3605	1414	1781	4479	674	3456	4788	412
Grp Volume(v), veh/h	73	557	297	205	702	337	101	984	506	448	658	348
Grp Sat Flow(s),veh/h/ln	1781	1702	1806	1781	1702	1616	1781	1702	1749	1728	1702	1796
Q Serve(g_s), s	4.6	22.3	22.4	12.6	27.3	27.7	4.1	30.2	30.2	9.0	16.3	16.4
Cycle Q Clear(g_c), s	4.6	22.3	22.4	12.6	27.3	27.7	4.1	30.2	30.2	9.0	16.3	16.4
Prop In Lane	1.00		0.20	1.00		0.88	1.00		0.39	1.00		0.23
Lane Grp Cap(c), veh/h	159	638	338	258	848	402	350	1599	822	577	1747	922
V/C Ratio(X)	0.46	0.87	0.88	0.79	0.83	0.84	0.29	0.62	0.62	0.78	0.38	0.38
Avail Cap(c_a), veh/h	200	681	361	330	948	450	397	1599	822	783	1747	922
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.6	55.3	55.3	40.6	49.7	49.9	18.1	27.7	27.7	24.3	20.6	20.6
Incr Delay (d2), s/veh	2.1	11.6	20.3	9.9	5.7	12.0	0.4	1.8	3.4	3.5	0.6	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	10.6	12.1	6.3	12.3	12.5	1.8	12.7	13.4	3.8	6.7	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.6	66.8	75.6	50.4	55.4	61.9	18.5	29.5	31.1	27.8	21.2	21.8
LnGrp LOS	D	E	E	D	E	E	B	C	C	C	C	C
Approach Vol, veh/h		927			1244			1591			1454	
Approach Delay, s/veh		68.1			56.3			29.3			23.3	
Approach LOS		E			E			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.6	71.8	19.4	32.2	10.5	77.9	10.7	40.9				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	20.5	50.0	20.5	28.0	9.7	60.8	9.5	39.0				
Max Q Clear Time (g_c+l1), s	11.0	32.2	14.6	24.4	6.1	18.4	6.6	29.7				
Green Ext Time (p_c), s	1.2	10.0	0.3	1.8	0.1	8.4	0.0	4.7				
<b>Intersection Summary</b>												
HCM 6th Ctrl Delay			41.0									
HCM 6th LOS			D									

# Timings

## 1: Chambers Road & Smoky Hill Road

2050 Total AM

04/26/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↰	↑↑↑	↰	↑↑↑	↰	↑↑↑	↰	↑↑↑
Traffic Volume (vph)	108	385	108	720	51	513	222	908
Future Volume (vph)	108	385	108	720	51	513	222	908
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	24.0	9.5	24.0	9.5	24.0
Total Split (s)	20.0	58.0	15.0	53.0	14.0	51.0	16.0	53.0
Total Split (%)	14.3%	41.4%	10.7%	37.9%	10.0%	36.4%	11.4%	37.9%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max

### Intersection Summary

Cycle Length: 140

Actuated Cycle Length: 140

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

Natural Cycle: 70

Control Type: Actuated-Coordinated

Splits and Phases: 1: Chambers Road & Smoky Hill Road

Ø1	Ø2 (R)	Ø3	Ø4
16 s	51 s	15 s	58 s
Ø5	Ø6 (R)	Ø7	Ø8
14 s	53 s	20 s	53 s









# HCM 6th Signalized Intersection Summary

2050 Total AM

## 1: Chambers Road & Smoky Hill Road

04/26/2024



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	385	78	108	720	305	51	513	45	222	908	30
Future Volume (veh/h)	108	385	78	108	720	305	51	513	45	222	908	30
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	1856	1856	1856	1870	1870	1870	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	111	397	80	111	742	314	53	529	46	229	936	31
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	3	3	3	2	2	2	4	4	4	3	3	3
Cap, veh/h	191	1120	219	326	927	388	324	2250	194	937	2500	83
Arrive On Green	0.06	0.26	0.26	0.06	0.26	0.26	0.03	0.48	0.48	0.05	0.50	0.50
Sat Flow, veh/h	1767	4251	832	1781	3530	1478	1753	4712	406	3428	5036	167
Grp Volume(v), veh/h	111	313	164	111	715	341	53	374	201	229	627	340
Grp Sat Flow(s),veh/h/ln	1767	1689	1706	1781	1702	1604	1753	1675	1768	1714	1689	1826
Q Serve(g_s), s	6.4	10.5	11.0	6.3	27.5	27.8	2.1	9.2	9.4	4.7	16.1	16.1
Cycle Q Clear(g_c), s	6.4	10.5	11.0	6.3	27.5	27.8	2.1	9.2	9.4	4.7	16.1	16.1
Prop In Lane	1.00		0.49	1.00		0.92	1.00		0.23	1.00		0.09
Lane Grp Cap(c), veh/h	191	890	449	326	894	421	324	1599	844	937	1677	906
V/C Ratio(X)	0.58	0.35	0.37	0.34	0.80	0.81	0.16	0.23	0.24	0.24	0.37	0.37
Avail Cap(c_a), veh/h	281	1254	634	355	1143	539	388	1599	844	1047	1677	906
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.8	41.9	42.0	34.9	48.2	48.3	18.1	21.5	21.6	17.0	21.8	21.8
Incr Delay (d2), s/veh	2.8	0.2	0.5	0.6	3.2	7.1	0.2	0.3	0.7	0.1	0.6	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	4.5	4.7	2.8	12.1	12.0	0.9	3.8	4.1	1.9	6.6	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	42.1	42.5	35.5	51.4	55.4	18.4	21.9	22.2	17.2	22.4	23.0
LnGrp LOS	D	D	D	D	D	E	B	C	C	B	C	C
Approach Vol, veh/h	588		1167				628		1196			
Approach Delay, s/veh	41.9		51.1				21.7		21.6			
Approach LOS	D		D				C		C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.5	72.8	12.7	42.9	8.9	75.5	12.9	42.8				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	11.5	45.0	10.5	52.0	9.5	47.0	15.5	47.0				
Max Q Clear Time (g_c+I1), s	6.7	11.4	8.3	13.0	4.1	18.1	8.4	29.8				
Green Ext Time (p_c), s	0.3	4.1	0.0	3.4	0.0	7.4	0.1	6.9				

### Intersection Summary

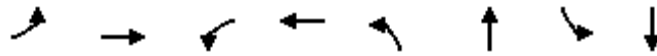
HCM 6th Ctrl Delay	34.6
HCM 6th LOS	C

# Timings

## 1: Chambers Road & Smoky Hill Road

2050 Total PM

04/26/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	115	707	182	699	137	1148	439	859
Future Volume (vph)	115	707	182	699	137	1148	439	859
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	3	8	5	2	1	6
Permitted Phases	4		8		2		6	
Detector Phase	7	4	3	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	9.5	24.0	9.5	24.0	9.5	24.0	9.5	24.0
Total Split (s)	16.0	34.0	24.0	42.0	19.1	55.0	27.0	62.9
Total Split (%)	11.4%	24.3%	17.1%	30.0%	13.6%	39.3%	19.3%	44.9%
Yellow Time (s)	3.5	4.0	3.5	4.0	3.5	4.0	3.5	4.0
All-Red Time (s)	1.0	2.0	1.0	2.0	1.0	2.0	1.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max

### Intersection Summary

Cycle Length: 140

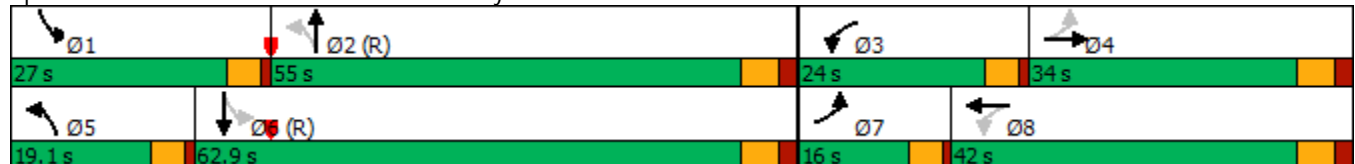
Actuated Cycle Length: 140

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

Natural Cycle: 80

Control Type: Actuated-Coordinated

Splits and Phases: 1: Chambers Road & Smoky Hill Road































# HCM 6th Signalized Intersection Summary

2050 Total PM





## 1: Chambers Road & Smoky Hill Road

04/26/2024

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		  			  			  			  	
Traffic Volume (veh/h)	115	707	53	182	699	261	137	1148	172	439	859	72
Future Volume (veh/h)	115	707	53	182	699	261	137	1148	172	439	859	72
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	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	126	777	58	200	768	287	151	1262	189	482	944	79
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	194	1008	75	269	882	327	354	1992	298	596	2301	192
Arrive On Green	0.07	0.21	0.21	0.10	0.24	0.24	0.06	0.44	0.44	0.10	0.48	0.48
Sat Flow, veh/h	1781	4849	360	1781	3671	1359	1781	4482	671	3456	4801	401
Grp Volume(v), veh/h	126	544	291	200	712	343	151	958	493	482	669	354
Grp Sat Flow(s),veh/h/ln	1781	1702	1805	1781	1702	1626	1781	1702	1750	1728	1702	1798
Q Serve(g_s), s	7.7	21.1	21.3	12.0	28.1	28.5	6.4	30.5	30.5	10.1	17.8	17.9
Cycle Q Clear(g_c), s	7.7	21.1	21.3	12.0	28.1	28.5	6.4	30.5	30.5	10.1	17.8	17.9
Prop In Lane	1.00		0.20	1.00		0.84	1.00		0.38	1.00		0.22
Lane Grp Cap(c), veh/h	194	708	375	269	818	391	354	1513	778	596	1632	862
V/C Ratio(X)	0.65	0.77	0.77	0.74	0.87	0.88	0.43	0.63	0.63	0.81	0.41	0.41
Avail Cap(c_a), veh/h	217	708	375	336	875	418	431	1513	778	820	1632	862
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	52.3	52.3	38.8	51.1	51.2	19.5	30.1	30.1	25.5	23.6	23.6
Incr Delay (d2), s/veh	5.6	5.2	9.7	6.7	9.0	18.1	0.8	2.0	3.9	4.3	0.8	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	9.6	10.7	5.8	13.0	13.6	2.8	12.9	13.7	4.4	7.4	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.6	57.4	62.1	45.5	60.1	69.3	20.3	32.1	34.0	29.8	24.4	25.1
LnGrp LOS	D	E	E	D	E	E	C	C	C	C	C	C
Approach Vol, veh/h		961			1255			1602			1505	
Approach Delay, s/veh		57.6			60.3			31.6			26.3	
Approach LOS		E			E			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.0	68.2	18.7	35.1	13.1	73.1	14.2	39.6				
Change Period (Y+Rc), s	4.5	6.0	4.5	6.0	4.5	6.0	4.5	6.0				
Max Green Setting (Gmax), s	22.5	49.0	19.5	28.0	14.6	56.9	11.5	36.0				
Max Q Clear Time (g_c+l1), s	12.1	32.5	14.0	23.3	8.4	19.9	9.7	30.5				
Green Ext Time (p_c), s	1.4	9.3	0.3	2.2	0.2	8.4	0.0	3.2				
Intersection Summary												
HCM 6th Ctrl Delay			41.5									
HCM 6th LOS			D									

HCM 6th TWSC  
2: Smoky Hill Road & Full Access

2026 Total AM  
04/26/2024

Intersection						
Int Delay, s/veh	1.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	36	450	584	110	60	51
Future Vol, veh/h	36	450	584	110	60	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	2	2	2	2
Mvmt Flow	39	489	635	120	65	55
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	755	0	-	0	969	378
Stage 1	-	-	-	-	695	-
Stage 2	-	-	-	-	274	-
Critical Hdwy	5.38	-	-	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	3.14	-	-	-	3.82	3.92
Pot Cap-1 Maneuver	883	-	-	-	552	*779
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	686	-
Platoon blocked, %	1	-	-	-	1	1
Mov Cap-1 Maneuver	883	-	-	-	528	*779
Mov Cap-2 Maneuver	-	-	-	-	565	-
Stage 1	-	-	-	-	744	-
Stage 2	-	-	-	-	686	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.7	0		11.8		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	883	-	-	-	647	
HCM Lane V/C Ratio	0.044	-	-	-	0.186	
HCM Control Delay (s)	9.3	-	-	-	11.8	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon



HCM 6th TWSC  
2: Smoky Hill Road & Full Access

2026 Total PM  
04/26/2024

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↱	↑↑↑	↑↑↑↱		↱	
Traffic Vol, veh/h	33	729	620	102	59	44
Future Vol, veh/h	33	729	620	102	59	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	792	674	111	64	48
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	785	0	-	0	1119	393
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	389	-
Critical Hdwy	5.34	-	-	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	3.12	-	-	-	3.82	3.92
Pot Cap-1 Maneuver	857	-	-	-	455	*779
Stage 1	-	-	-	-	737	-
Stage 2	-	-	-	-	599	-
Platoon blocked, %	1	-	-	-	1	1
Mov Cap-1 Maneuver	857	-	-	-	436	*779
Mov Cap-2 Maneuver	-	-	-	-	491	-
Stage 1	-	-	-	-	706	-
Stage 2	-	-	-	-	599	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.4	0		12.6		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	857	-	-	-	583	
HCM Lane V/C Ratio	0.042	-	-	-	0.192	
HCM Control Delay (s)	9.4	-	-	-	12.6	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon







HCM 6th TWSC  
2: Smoky Hill Road & Full Access

2050 Total AM  
04/26/2024

Intersection						
Int Delay, s/veh	1.1					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑↑	↱	↰	↱
Traffic Vol, veh/h	36	545	709	110	60	51
Future Vol, veh/h	36	545	709	110	60	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	4	4	2	2	2	2
Mvmt Flow	39	592	771	120	65	55
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	891	0	-	0	1146	446
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	315	-
Critical Hdwy	5.38	-	-	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	-	6.04	-
Follow-up Hdwy	3.14	-	-	-	3.82	3.92
Pot Cap-1 Maneuver	813	-	-	-	477	*760
Stage 1	-	-	-	-	708	-
Stage 2	-	-	-	-	654	-
Platoon blocked, %	1	-	-	-	1	1
Mov Cap-1 Maneuver	813	-	-	-	454	*760
Mov Cap-2 Maneuver	-	-	-	-	510	-
Stage 1	-	-	-	-	674	-
Stage 2	-	-	-	-	654	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.6	0		12.5		
HCM LOS	B					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	813	-	-	-	601	
HCM Lane V/C Ratio	0.048	-	-	-	0.201	
HCM Control Delay (s)	9.7	-	-	-	12.5	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0.2	-	-	-	0.7	
Notes						
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined		*: All major volume in platoon

HCM 6th TWSC  
2: Smoky Hill Road & Full Access

2050 Total PM  
04/26/2024

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	33	880	749	102	59	44
Future Vol, veh/h	33	880	749	102	59	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	75	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	36	957	814	111	64	48

Major/Minor	Major1	Major2	Minor2		
Conflicting Flow All	925	0	0	1325	463
Stage 1	-	-	-	870	-
Stage 2	-	-	-	455	-
Critical Hdwy	5.34	-	-	5.74	7.14
Critical Hdwy Stg 1	-	-	-	6.64	-
Critical Hdwy Stg 2	-	-	-	6.04	-
Follow-up Hdwy	3.12	-	-	3.82	3.92
Pot Cap-1 Maneuver	859	-	-	408	*741
Stage 1	-	-	-	752	-
Stage 2	-	-	-	554	-
Platoon blocked, %	1	-	-	1	1
Mov Cap-1 Maneuver	859	-	-	391	*741
Mov Cap-2 Maneuver	-	-	-	456	-
Stage 1	-	-	-	720	-
Stage 2	-	-	-	554	-

Approach	EB	WB	SB
HCM Control Delay, s	0.3	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	859	-	-	-	546
HCM Lane V/C Ratio	0.042	-	-	-	0.205
HCM Control Delay (s)	9.4	-	-	-	13.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.8

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

HCM 6th TWSC  
3: Chambers Road & RIRO Access

2026 Total AM  
04/26/2024

Intersection

Int Delay, s/veh 0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑↑	
Traffic Vol, veh/h	0	99	0	762	866	72
Future Vol, veh/h	0	99	0	762	866	72
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	3	3
Mvmt Flow	0	108	0	828	941	78

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 510	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 7.14	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.92	- -	- -
Pot Cap-1 Maneuver	0 435	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 435	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

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

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 435	- -	- -
HCM Lane V/C Ratio	- 0.247	- -	- -
HCM Control Delay (s)	- 16	- -	- -
HCM Lane LOS	- C	- -	- -
HCM 95th %tile Q(veh)	- 1	- -	- -

HCM 6th TWSC  
3: Chambers Road & RIRO Access

2026 Total PM  
04/26/2024

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑↑	
Traffic Vol, veh/h	0	91	0	1258	1106	50
Future Vol, veh/h	0	91	0	1258	1106	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	3	3
Mvmt Flow	0	99	0	1367	1202	54
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	628	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	365	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	365	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	18.5	0	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	-	365	-	-		
HCM Lane V/C Ratio	-	0.271	-	-		
HCM Control Delay (s)	-	18.5	-	-		
HCM Lane LOS	-	C	-	-		
HCM 95th %tile Q(veh)	-	1.1	-	-		

HCM 6th TWSC  
3: Chambers Road & RIRO Access

2050 Total AM  
04/26/2024

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑↑	
Traffic Vol, veh/h	0	99	0	913	1050	72
Future Vol, veh/h	0	99	0	913	1050	72
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	3	3
Mvmt Flow	0	108	0	992	1141	78
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	610	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	375	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	375	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	18.4	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	- 375		-	-		
HCM Lane V/C Ratio	- 0.287		-	-		
HCM Control Delay (s)	- 18.4		-	-		
HCM Lane LOS	- C		-	-		
HCM 95th %tile Q(veh)	- 1.2		-	-		



HCM 6th TWSC  
3: Chambers Road & RIRO Access

2050 Total PM  
04/26/2024

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑↑	↑↑↑	
Traffic Vol, veh/h	0	91	0	1510	1336	50
Future Vol, veh/h	0	91	0	1510	1336	50
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	3	3
Mvmt Flow	0	99	0	1641	1452	54
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	753	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	302	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	302	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	22.6	0	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	-	302	-	-		
HCM Lane V/C Ratio	-	0.328	-	-		
HCM Control Delay (s)	-	22.6	-	-		
HCM Lane LOS	-	C	-	-		
HCM 95th %tile Q(veh)	-	1.4	-	-		



# APPENDIX E

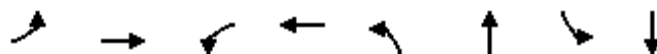
## Queue Analysis Worksheets

## Queues

2026 Total AM

## 1: Chambers Road &amp; Smoky Hill Road

04/26/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	101	395	92	882	49	474	196	808
v/c Ratio	0.48	0.33	0.27	0.76	0.14	0.20	0.20	0.32
Control Delay	36.5	39.4	30.8	49.9	16.2	23.0	15.0	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.5	39.4	30.8	49.9	16.2	23.0	15.0	23.2
Queue Length 50th (ft)	63	100	57	253	18	87	39	160
Queue Length 95th (ft)	94	120	86	286	45	136	70	232
Internal Link Dist (ft)		252		496		327		263
Turn Bay Length (ft)	100		250		225		200	
Base Capacity (vph)	263	1810	362	1651	402	2323	1049	2498
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.38	0.22	0.25	0.53	0.12	0.20	0.19	0.32

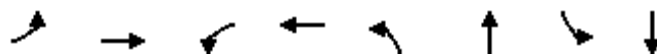
## Intersection Summary

## Queues

2026 Total PM

## 1: Chambers Road &amp; Smoky Hill Road

04/26/2024



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	114	692	166	880	134	1200	408	853
v/c Ratio	0.57	0.70	0.63	0.79	0.35	0.54	0.66	0.36
Control Delay	42.9	56.0	43.0	53.0	16.9	30.8	19.9	24.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.9	56.0	43.0	53.0	16.9	30.8	19.9	24.5
Queue Length 50th (ft)	72	213	108	258	53	289	86	175
Queue Length 95th (ft)	114	261	160	304	93	379	123	234
Internal Link Dist (ft)		252		496		327		263
Turn Bay Length (ft)	100		250		225		200	
Base Capacity (vph)	227	1036	315	1234	418	2208	774	2395
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.67	0.53	0.71	0.32	0.54	0.53	0.36

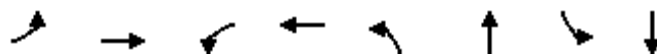
## Intersection Summary

## Queues

2050 Total AM

## 1: Chambers Road &amp; Smoky Hill Road

04/26/2024



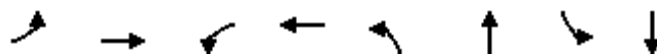
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	111	477	111	1056	53	575	229	967
v/c Ratio	0.53	0.33	0.31	0.77	0.19	0.28	0.27	0.43
Control Delay	34.1	35.9	27.5	46.8	20.2	28.5	18.7	29.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.1	35.9	27.5	46.8	20.2	28.5	18.7	29.0
Queue Length 50th (ft)	64	116	64	302	23	122	52	221
Queue Length 95th (ft)	93	134	93	330	53	180	88	309
Internal Link Dist (ft)		252		496		327		263
Turn Bay Length (ft)	100		250		225		200	
Base Capacity (vph)	249	1845	364	1684	305	2062	868	2256
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.26	0.30	0.63	0.17	0.28	0.26	0.43
Intersection Summary								

## Queues

2050 Total PM

## 1: Chambers Road &amp; Smoky Hill Road

04/26/2024



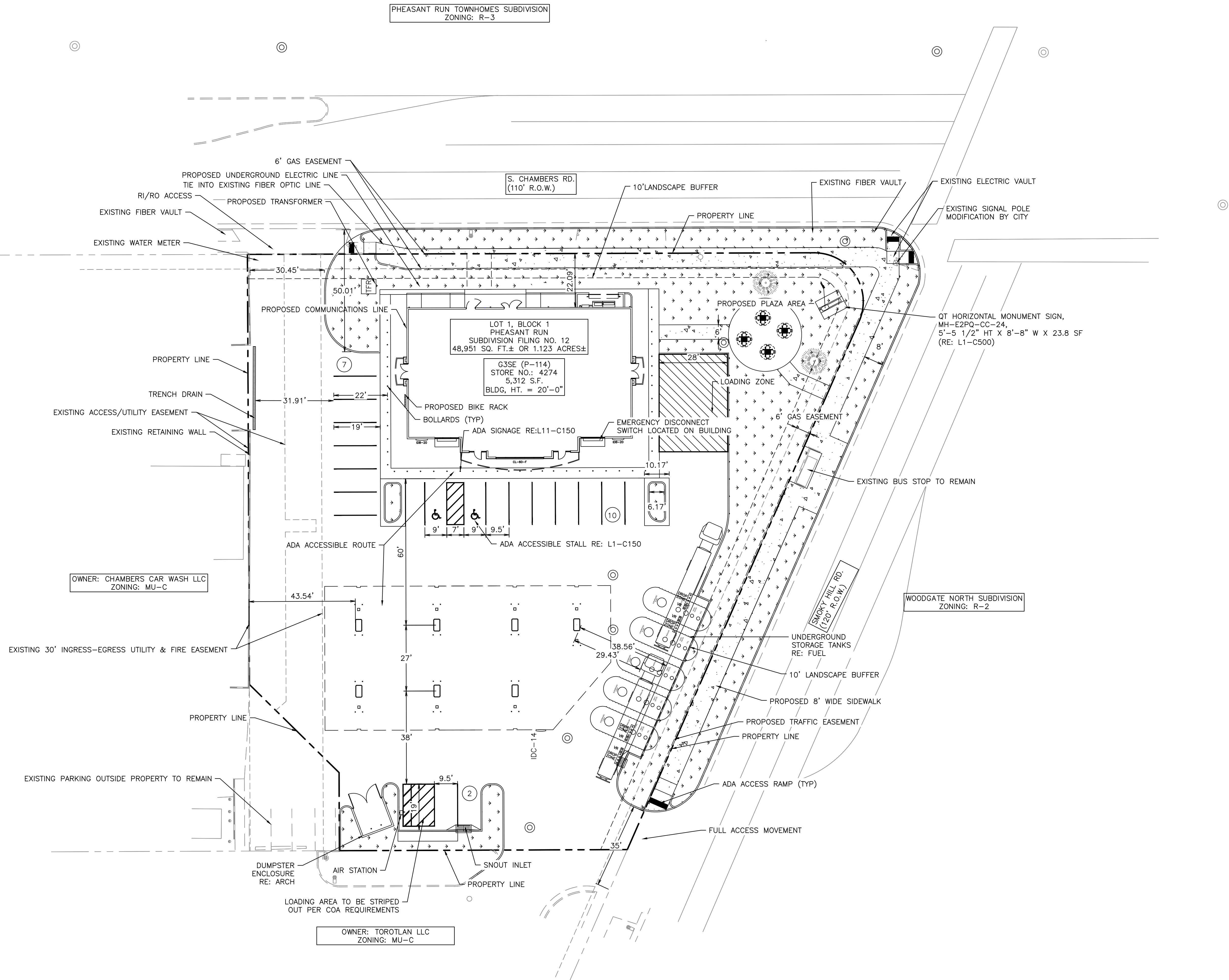
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	126	835	200	1055	151	1451	482	1023
v/c Ratio	0.66	0.79	0.77	0.84	0.47	0.75	0.82	0.46
Control Delay	48.6	58.6	53.2	53.9	21.0	40.3	48.3	28.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.6	58.6	53.2	53.9	21.0	40.3	48.3	28.1
Queue Length 50th (ft)	76	259	126	313	65	423	168	238
Queue Length 95th (ft)	130	320	208	371	103	498	229	293
Internal Link Dist (ft)		252		496		327		263
Turn Bay Length (ft)	100		250		225		200	
Base Capacity (vph)	201	1057	297	1302	360	1942	655	2248
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.79	0.67	0.81	0.42	0.75	0.74	0.46
Intersection Summary								



# APPENDIX F

## Conceptual Site Plan

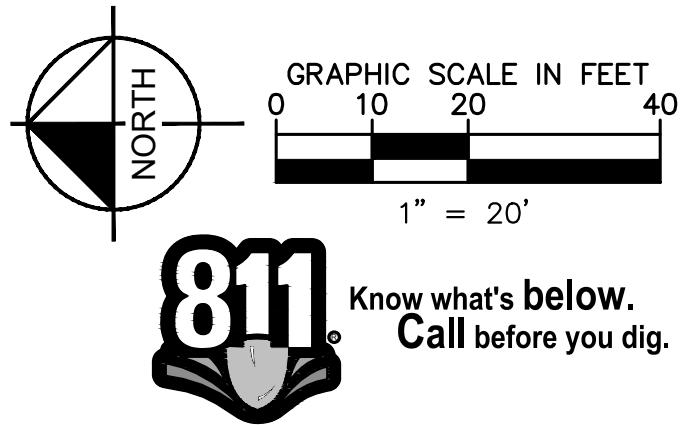
\\s:\dev-civil\09688040\_s\14-15\_4274\_s\09688040\CDP\09688040\_SP\_OVERALL.dwg Kish, Maddy  
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- LEGEND**
- EXISTING PROPERTY LINE
  - PROPOSED SITE PROPERTY LINE
  - EASEMENT LINE
  - SITE LIGHT
  - PROPOSED STORM DRAINAGE INLET
  - PROPOSED LANDSCAPE
  - PROPOSED SIDEWALK
  - EXISTING SIDEWALK
  - EXISTING FIRE HYDRANT
  - PROPOSED ADA ROUTE
  - STORM MANHOLE
  - SANITARY MANHOLE

**NOTES**

1. THESE PLANS ARE NOT FOR CONSTRUCTION.
2. PUBLIC IMPROVEMENTS MUST BE COMPLETED AND ACCEPTED PRIOR TO THE COMMENCEMENT OF BUSINESS OPERATIONS
3. SITE LAYOUT SHOWN ON FUTURE LOT 2 IS FOR SCHEMATIC PURPOSES ONLY AND WILL BE FURTHER DEFINED WITH THE DEVELOPMENT OF LOT 2.
4. THE PROPOSED USE IS COMPLIANT WITH COA ZONING CODE SECTION 66-33. THE SITE DOES NOT LIE WITHIN 500 FT OF ANY E, I, OR R-4 OCCUPANCY.
5. SITE PLAN AS SHOWN ON THE ADJACENT UNPLATTED PROPERTY HAS NOT BEEN REVIEWED OR APPROVED BY STAFF AND IS SUBJECT TO CHANGE.



**Kimley»Horn**

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Greenwood Village, CO 80111 (303) 228-2300

DESIGNED BY: MGK  
DRAWN BY: MGK  
CHECKED BY: DNP  
DATE: 10/31/2023

**QUICKTRIP 4274**  
**E. SMOKY HILL RD & S. CHAMBERS RD**  
**SITE PLAN**  
LOT 1, BLOCK 1, PHEASANT RUN SUBDIVISION FILING NO. 12,  
COUNTY OF ARAPAHOE, STATE OF COLORADO  
MASTER SITE PLAN

**PRELIMINARY**  
FOR REVIEW ONLY  
NOT FOR  
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**Kimley»Horn**  
Kimley-Horn and Associates, Inc.

PROJECT NO.  
096888040

DRAWING NAME