Traffic Impact Analysis

Alliance Cole Avenue Residential Site
Dallas, Texas

February 15, 2018

Kimley-Horn and Associates, Inc.
Dallas, Texas

Project #064524900
Registered Firm F-928

Kimley»Horn

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Alliance Cole Avenue Residential Site
SEC Cole Avenue and Armstrong Avenue
Oak Lawn District
Dallas, Texas

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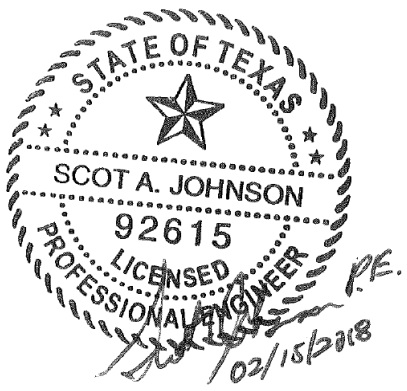

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EXECUTIVE SUMMARY

The proposed Alliance Cole Avenue residential site is located at the southeast corner of Cole Avenue and Armstrong Avenue in Dallas, TX. This study is intended to identify traffic generation characteristics, identify potential traffic related impacts on the local street system, and to develop mitigation measures required for identified impacts.

The following existing intersection was selected to be part of this study:

- Cole Avenue at Armstrong Avenue.

The analysis also included the following proposed driveway:

- The Driveway, which is a full-access driveway to Armstrong Avenue.

Traffic operations were analyzed at the study intersections for existing 2018 volumes, 2020 and 2025 background traffic volumes, and 2020 and 2025 background plus site-generated traffic volumes. The future years correspond to the expected buildout year of the site and a key future study year. Conditions were analyzed for the weekday AM and PM peak hours.

The proposed Alliance Cole Avenue residential site is expected to generate approximately 168 new weekday AM peak hour one-way trips and 202 new weekday PM peak hour one-way trips at buildout. The distribution of the site-generated traffic volumes onto the street system was based on the surrounding roadway network, existing traffic patterns, and the project's proposed access location.

Based on the analysis presented in this report, the proposed Alliance Cole Avenue residential site can be successfully incorporated into the surrounding roadway network. The proposed site driveways provide the appropriate level of access for the development. The site-generated traffic does not significantly affect the existing traffic operations.

The existing traffic volumes of the intersection of Cole Avenue and Armstrong Avenue do not meet volume thresholds for all-way stop-control warrants or signal warrants. With the background developments in the area, signal warrants are expected to be met without any site-generated traffic from the Alliance Cole Avenue site, so a signal cannot be the sole responsibility of the development. Even though the signal is not a condition for the Alliance Cole Avenue development, the project should be a part of the signalization effort which will benefit the neighborhood. The signal is the only real means for mitigating the unfavorable and growing delays experienced by Armstrong Avenue traffic and pedestrians. This signal will be even more important for east-west vehicle movement and pedestrian movement in the future.

I. INTRODUCTION

A. Purpose

Kimley-Horn was retained to conduct a Traffic Impact Analysis (TIA) of future traffic conditions associated with the development of the Alliance Cole Avenue residential site located at the southeast corner of the intersection of Cole Avenue and Armstrong Avenue. A site vicinity map is provided as **Exhibit 1**. **Exhibit 2** shows the proposed conceptual site plan. This study is intended to identify traffic generation characteristics, identify potential traffic related impacts on the local street system, and to develop mitigation measures required for identified impacts.

B. Methodology

Traffic operations were analyzed at the study intersections for AM and PM peak hours for the following scenarios.

- 2018 existing traffic
- 2020 background traffic
- 2020 background plus site traffic
- 2025 background traffic
- 2025 background plus site traffic

The capacity analyses were conducted using the *Synchro*™ software package and *Highway Capacity Manual* reports for signalized and unsignalized intersections.

EXHIBIT 1
Vicinity Map

LEGEND:
= Study Intersection

North
Not To Scale

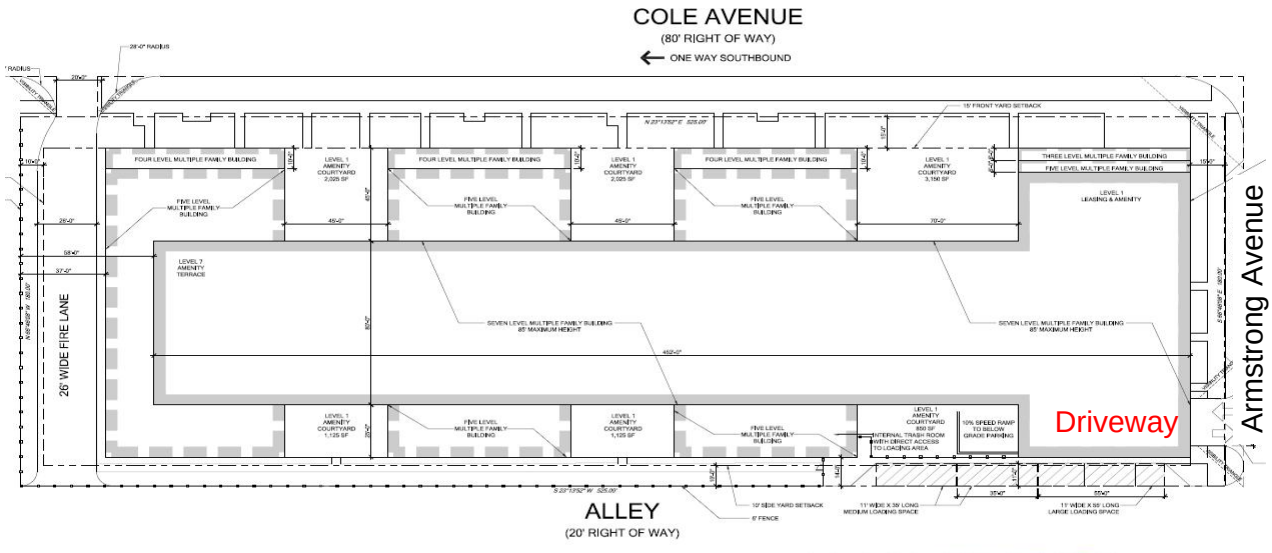

EXHIBIT 2
Conceptual Plan

North
Not To Scale

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II. EXISTING AND FUTURE AREA CONDITIONS

A. Roadway Characteristics

The following existing unsignalized intersection was evaluated as part of this study:

- Cole Avenue at Armstrong Avenue

There were no existing signalized intersections included in this study. The major study area roadways are described below.

Cole Avenue – is currently a three-lane, one-way couplet roadway. The roadway is a southbound thoroughfare. In the project vicinity, Cole Avenue has intersections with Oliver Avenue, Armstrong Avenue, Knox Street, and numerous unsignalized intersections with residential and commercial driveways. The speed limit is 30 MPH. Cole Avenue is classified as a minor arterial (SPCL 3U) on the City's Thoroughfare Plan. McKinney Avenue and Cole Avenue have been approved to be converted from a one-way couplet to two-way operation on each street. The configuration for Cole Avenue will likely be one travel lane in each direction, and the analysis in this report reflects the latter configuration. Currently, funding is not available for this conversion project, so there is no construction schedule.

Armstrong Avenue – is a two-lane, undivided, local street in the study area that generally travels east-west in the project vicinity. Currently, Armstrong Avenue has unsignalized intersections with Travis Street, Cole Avenue, McKinney Avenue, and the southbound frontage road of US 75. The speed limit is 30 MPH. Armstrong Avenue is not designated on the City's Thoroughfare Plan.

Exhibit 3 illustrates the existing intersection geometry used for the traffic analysis.

B. Existing Study Area

The existing site is made up of multifamily units and condominiums. The site lies within PD 193 (MF-2), which is also known as the Oak Lawn District. It is immediately surrounded by mixed-use and multifamily areas.

C. Proposed Site Improvements

The site as proposed will include 335 dwelling units of multifamily apartments.

The site would have access via one driveway. The driveway to be modeled in this analysis is as follows:

Driveway – would be a full-access driveway to Armstrong Avenue approximately 180 feet east of the intersection of Cole Avenue and Armstrong Avenue. One lane will be provided for the inbound movement, and one lane for the outbound movement.

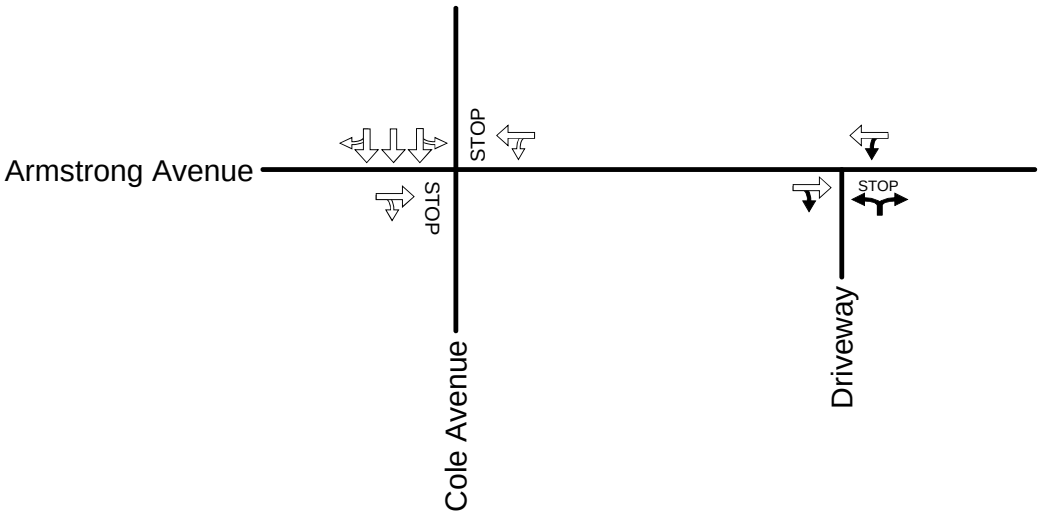
Intersection sight distance at the driveway is acceptable, with it being on a relatively flat and straight segment of Armstrong Avenue.

D. Existing Traffic Volumes

24-hour turning movement counts were collected in January of 2018 at the intersection of Cole Avenue and Armstrong Avenue. **Exhibit 4** shows the existing weekday AM and PM peak hour traffic volumes. The raw count sheets are provided in the **Appendix**, as well as a comparison between the 24-hour volumes collected and previous 24-hour counts.

The 24-hour count showed the daily volume on the roadway link as follows:

- Cole Avenue: 7,262 vehicles per day (vpd)
- Armstrong Avenue: 3,110 vpd



LEGEND:

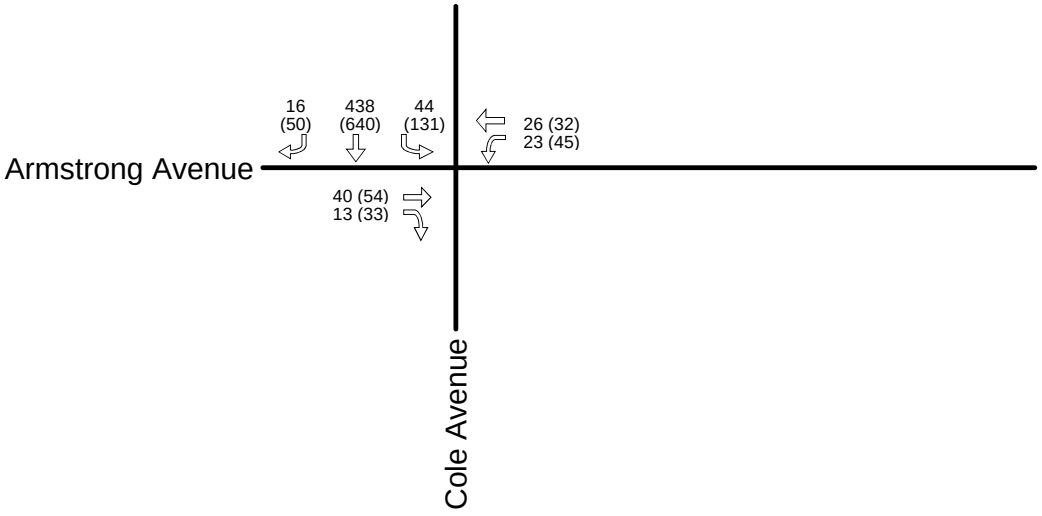
= Signalized Intersection
STOP = Stop-Controlled Approach
= Travel Lane
* = Turn Bay
= Driveway Lanes or Off-Site Improvements
TWLTL = Two-Way Left Turn Lane

North

Not To Scale

EXHIBIT 3

Lane Assignment and Intersection Control



LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North

Not To Scale

EXHIBIT 4

2018 Existing Traffic Volumes

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III. PROJECT TRAFFIC CHARACTERISTICS

A. Site-Generated Traffic

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 9th edition of *Trip Generation Manual* published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. The trips indicated are actually one-way trips or *trip ends*, where one vehicle entering and exiting the site is counted as one inbound trip and one outbound trip.

A 5% reduction for multimodal use was taken due to the general mixed-use nature of the neighborhood and the proximity of the Katy Trail to the site (approximately 1,000 feet). NCTCOG has bicycle and pedestrian counters along the Katy Trail, with the nearest count stations at Fitzhugh Avenue to the south of Armstrong Avenue and at Harvard Avenue to the north. According to the 2016 Bicycle and Pedestrian Traffic Count report, the Katy Trail at Fitzhugh Avenue had 1,116,125 trips in 2016 with 81% pedestrians and 19% bicyclists. At the Katy Trail at Harvard Avenue count station, the report documented 573,225 trips in 2016 with approximately the same ratio of pedestrians to bicyclists. On average between the two count stations, the Katy Trail had 2,314 users per day.

No reductions were taken for pass-by trips or internal capture.

Table 1 shows the resulting daily and weekday AM and PM peak hour trip generation for the proposed development, showing new external trips.

Table 1 – Trip Generation

Land Uses	Amount	Units	ITE Code	Daily One-Way Trips	AM Peak Hour One-Way Trips			PM Peak Hour One-Way Trips		
					IN	OUT	TOTAL	IN	OUT	TOTAL
Apartment	335	Units	220	2,154	34	134	168	131	71	202
5% Multimodal Reduction				108	2	7	8	7	4	10
Total Net New External Vehicle Trips:				**2,046**	**32**	**127**	**160**	**124**	**67**	**192**

Trip Generation rates based on *ITE's Trip Generation Manual*, 9th Edition.

B. Trip Distribution and Assignment

The distribution of the site-generated traffic volumes into and out of the site driveways and onto the street system was based on the area street system characteristics, existing traffic patterns, relative residential density, and the location of the proposed driveway access to/from the site. **Table 2** displays the general directional distribution percentages assumed for the site.

Table 2 – General Directional Distribution

Direction (To/From)	Percent of Site Traffic
North	40%
South	25%
East	25%
West	10%

The corresponding inbound and outbound traffic assignment, where the directional distribution in **Table 2** is applied using the most probable paths to and from the site, can be found in **Exhibit 5**. **Exhibit 6** shows the resulting site-generated weekday AM and weekday PM peak hour turning movements after multiplying the new external trip generation for each phase by the respective traffic assignment percentages.

C. Other Development Traffic Modelling

Using the same procedure as was used to develop the Alliance Cole Avenue site-generated traffic and distribute that traffic on the roadway network, traffic was developed and distributed for the Travis Block Site, the McKinney-Cole Block Site, the 4510 Buena Vista Site, and the 3219 Knox Street Site (Weir's Plaza). The distribution and volumes for each of these developments can be found in the **Appendix**.

D. Development of 2020 Background Traffic

The existing traffic counts, population growth, and historic counts near the site were compared to find expected growth trends within the study area. Based on the recent growth in the area, an annual growth rate of 0.5% was assumed for the background traffic.

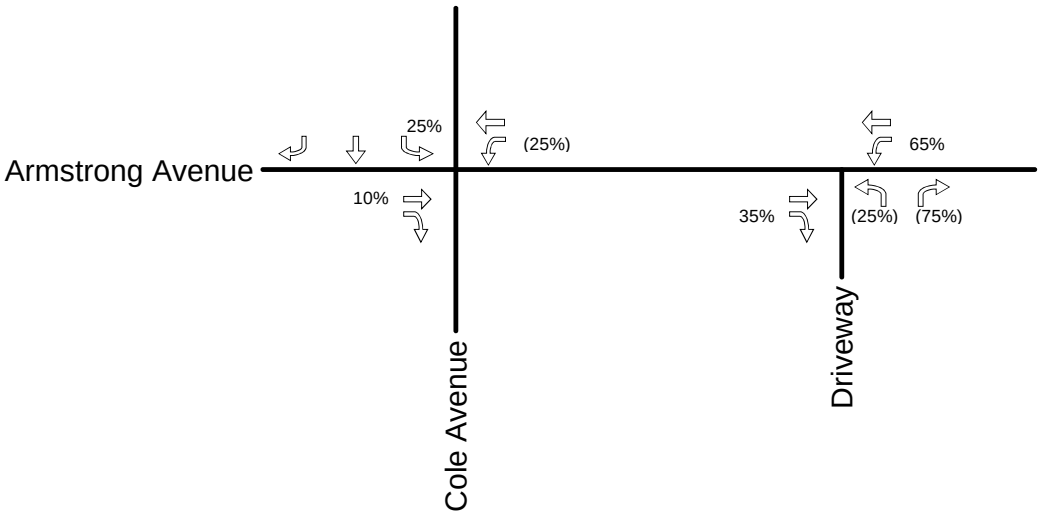
To find the 2020 background traffic, the existing 2018 traffic counts were grown by 0.5% annually for two years. Other development traffic volumes from the area were then added to these grown existing volumes to represent the other known traffic additions for the 2020 study year. The resulting 2020 background weekday AM and PM peak hour traffic volumes are shown in **Exhibit 7**.

E. Development of 2020 Total Traffic

Site generated traffic volumes were added to the background volumes to represent the estimated total (background plus site-generated) traffic conditions for the 2020 study year after completion of the proposed development. **Exhibit 8** shows the resulting 2020 weekday AM and PM peak hour total traffic volumes.

F. Development of 2025 Background and Total Traffic

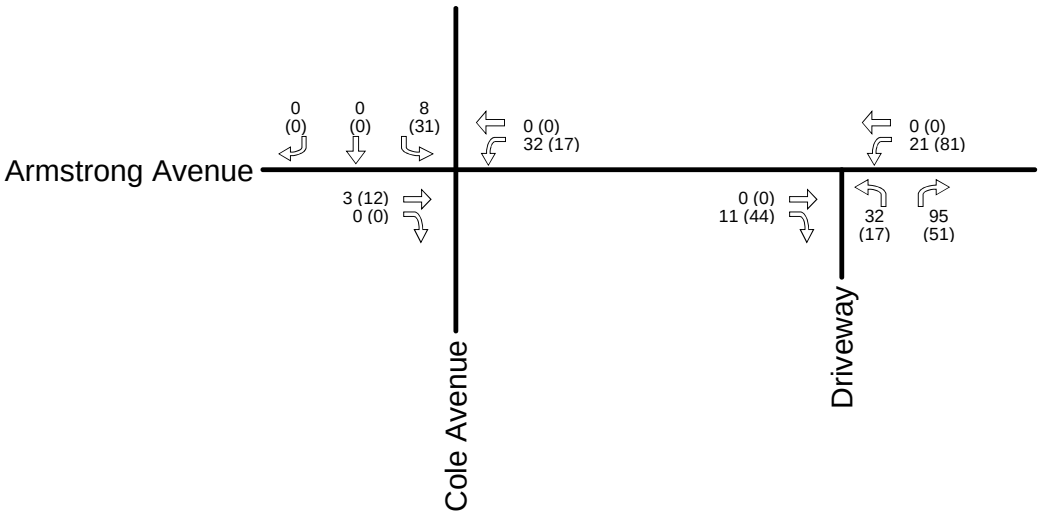
The background and total traffic volumes in the 2025 study year were calculated in a similar manner to the 2020 traffic volumes by adding five years of 0.5% growth over the 2020 background volumes. Other development traffic volumes near the site were then added to the grown existing volumes to represent the other known traffic additions for the 2025 study year. **Exhibit 9** shows the resulting 2025 weekday AM and PM peak hour background traffic volumes, and **Exhibit 10** shows the resulting 2025 weekday AM and PM peak hour total traffic volumes after the addition of the site-generated traffic.



LEGEND:
X% (Y%)
X% = Percentage of Inbound Site-Generated Traffic
(Y%) = Percentage of Outbound Site-Generated Traffic

North
Not To Scale

EXHIBIT 5
Trip Distribution and Traffic Assignment



LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North
Not To Scale

EXHIBIT 6
Site-Generated Trips

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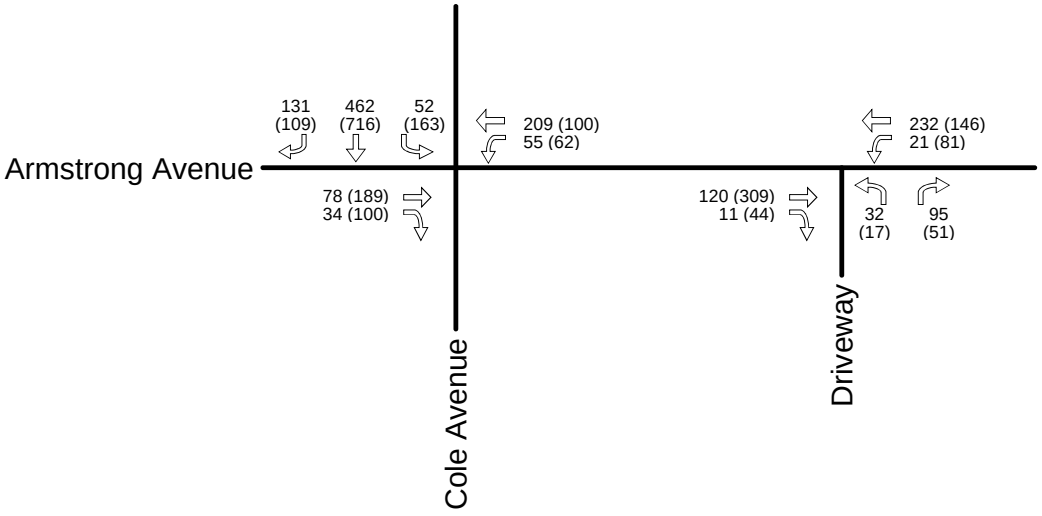
LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding
and presence of smaller driveways not included in analysis.

North
Not To Scale

EXHIBIT 7
2020 Background Traffic Volumes



LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding
and presence of smaller driveways not included in analysis.

North
Not To Scale

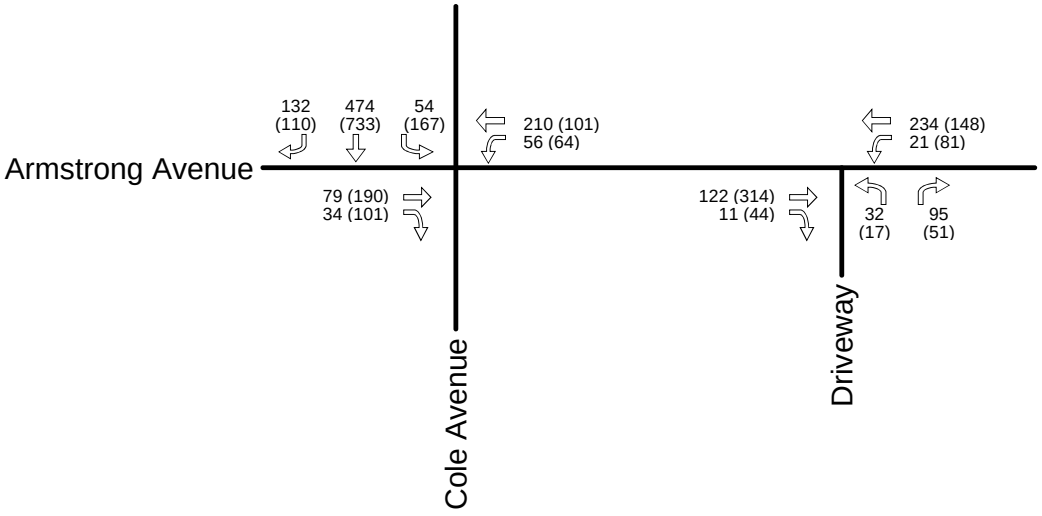
EXHIBIT 8
2020 Background Plus Site-Generated Traffic Volumes

Kimley»Horn

LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding
and presence of smaller driveways not included in analysis.

North
Not To Scale

EXHIBIT 9
2025 Background Traffic Volumes



LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding
and presence of smaller driveways not included in analysis.

North
Not To Scale

EXHIBIT 10
2025 Background Plus Site-Generated Traffic Volumes

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IV. TRAFFIC OPERATIONS ANALYSIS

Kimley-Horn conducted a traffic operations analysis to determine potential capacity deficiencies in the 2018, 2020 and 2025 study years at the study intersections. The acknowledged source for determining overall capacity is the current edition of the *Highway Capacity Manual.*

A. 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). **Table 3** shows the definition of level of service for signalized and unsignalized intersections.

Table 3 – 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, Special Report 209, Transportation Research Board, 2010.

Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections. For the unsignalized analysis, the level of service (LOS) for a two-way stop-controlled intersection is defined for each movement. Unlike signalized intersections which define LOS for each approach and for the intersection as a whole, LOS for two-way stop-controlled intersections is not defined as a whole.

Calculations for the level of service at the key intersections identified for study are provided in the **Appendix**. The analyses assumed the lane geometry and intersection control shown in **Exhibit 3**.

B. Analysis Results

Table 4 and **Table 5** show the intersection operational results for the weekday AM and PM peak hours, respectively. Cole Avenue is analyzed in its current configuration as a one-way, southbound road. Later in this report, Cole Avenue will be analyzed in its future two-way configuration.

Table 4 – Traffic Operational Results – Weekday AM Peak Hour

INTERSECTION	APPROACH	2018 Existing Traffic		2020 Background Traffic		2020 Background plus Site Traffic		2025 Background Traffic		2025 Background plus Site Traffic	
		AM Peak Hour		AM Peak Hour		AM Peak Hour		AM Peak Hour		AM Peak Hour	
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Armstrong Avenue @ Cole Avenue **Cole One-Way**	EB*	14.8	B	18.4	C	19.1	C	18.9	C	19.8	C
	WB*	14.3	B	48.5	E	66.3	F	53.7	F	74.5	F
Armstrong Avenue @ Driveway **Cole One-Way**	NB*	-	-	-	-	10.5	B	-	-	10.5	B
	WBL	-	-	-	-	7.5	A	-	-	7.5	A

* Stop-Controlled Approach - No movements in Time Period + Delay Exceeds 200 seconds

Background developments include the Knox Street Weir's development, the Buena Vista Street development, the Travis Block redevelopment, and the McKinney-Cole Block redevelopment north of Knox Street.

Table 5 – Traffic Operational Results – Weekday PM Peak Hour

INTERSECTION	APPROACH	2018 Existing Traffic		2020 Background Traffic		2020 Background plus Site Traffic		2025 Background Traffic		2025 Background plus Site Traffic	
		PM Peak Hour		PM Peak Hour		PM Peak Hour		PM Peak Hour		PM Peak Hour	
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Armstrong Avenue @ Cole Avenue **Cole One-Way**	EB*	29.4	D	200.0+	F	200.0+	F	200.0+	F	200.0+	F
	WB*	32.2	D	200.0+	F	200.0+	F	200.0+	F	200.0+	F
Armstrong Avenue @ Driveway **Cole One-Way**	NB*	-	-	-	-	12.3	B	-	-	12.4	B
	WBL	-	-	-	-	8.3	A	-	-	8.3	A

* Stop-Controlled Approach - No movements in Time Period + Delay Exceeds 200 seconds

Background developments include the Knox Street Weir's development, the Buena Vista Street development, the Travis Block redevelopment, and the McKinney-Cole Block redevelopment north of Knox Street.

C. 2018 Existing Traffic Operations

The analysis of the 2018 existing traffic operations shows that the both the east- and westbound approaches of the unsignalized intersection of Cole Avenue with Armstrong Avenue operate at LOS B during the AM peak hour and at LOS D during the PM peak hour.

D. 2020 Background Traffic Operations

With two years of background growth and the previously mentioned background developments added to the network, the intersection experiences added delay. During the AM peak hour, the eastbound approach changes from LOS B to C, and the westbound approach changes from LOS B to E. During the PM peak hour, both the east- and westbound approach change from LOS D to LOS F.

Due to the heavy delays of the Armstrong Avenue approaches at its intersection with Cole Avenue, a **Mitigation Analysis** will be performed later in this report.

E. 2020 Background Plus Site-Generated Traffic Operations

The addition of the site-generated traffic to the 2020 background traffic results in extra delay at the intersection with one increase in level of service. During the AM peak hour, the westbound approach of the intersection of Cole Avenue and Armstrong Avenue changes from LOS E to F.

With the addition of site-generated traffic, the intersection of Armstrong Avenue with the Driveway operates favorably. Both the northbound approach and the westbound left-turning approach operate at LOS B or better during both peak hours.

F. 2025 Background Traffic Operations

After an additional five years of background traffic volume growth, the analysis of the 2025 background traffic operations shows that there is one change in level of service from the 2020 background traffic analysis. During the AM peak hour, the westbound approach of the intersection of Cole Avenue and Armstrong Avenue changes from LOS E to F.

G. 2025 Background Plus Site-Generated Traffic Operations

The addition of the site-generated traffic to the 2025 background traffic results in no changes in level of service at the existing intersection of Cole Avenue and Armstrong Avenue.

With the addition of site-generated traffic, the intersection of Armstrong Avenue with the Driveway operates favorably. As was the case in the 2020 scenario, both the northbound approach and the westbound left-turning approach operate at LOS B or better during both peak hours.

H. Link Volume Analysis

The link capacity analysis examines the operating conditions of roadway links rather than intersections, using the daily and peak hour volumes passing a fixed point. The operating condition is defined by the ratio of link volume to link capacity, or V/C. The V/C of the different roadway links that would be impacted by the proposed development's traffic was calculated for the 2018 existing traffic, 2020 background and background plus site traffic, and 2025 background and background plus site traffic scenarios. The daily link capacity for each roadway is taken from the NCTCOG model capacity volumes. The capacity for a one-way, urban residential minor arterial, such as Cole Avenue, is 825 vehicles per hour per lane (vphpl). The capacity for an undivided, urban residential collector road, such as Armstrong Avenue, is 475 vphpl.

Cole Avenue was analyzed in its current one-way configuration. A link analysis after the two-way conversion of Cole Avenue is included later in this report.

The link analyses, displayed in **Table 6**, show that Cole Avenue currently operates at LOS A/B. With 2020 background growth, background development additions, and site-generated traffic, there are no changes in level of service. The same is true for the 2025 scenarios as the roadway link continues to operate LOS A/B with the addition of background and site-generated traffic.

Armstrong Avenue currently operates at LOS A/B as well. The addition of background traffic in 2020 changes the roadway from LOS A/B to C. With site-generated traffic, the link changes to just over the LOS D threshold during the 2020 scenario. Armstrong Avenue operates at LOS C with the 2025 background traffic and changes to just over the LOS D threshold with the 2025 site-generated traffic. Armstrong Avenue, during the maximum projected traffic scenario, still has 34% of additional capacity before reaching its volume limit.

The addition of the project site traffic leaves the two roadway links with more than enough capacity to handle the future daily roadway volumes.

Table 6 – Link Operational Results

Roadway Link		2018 Existing			2020 Background					2020 Background plus Site				
From	To	Volume	V/C Ratio	LOS	Assignment	Daily Volume	Total Volume	V/C Ratio	LOS	Assignment	Daily Volume	Total Volume	V/C Ratio	LOS
Cole Avenue					**4510 Buena Vista** 15.0%	200				**Alliance Site** 12.5%	256			
Knox Street	**Armstrong Avenue**	7,262	0.29	A/B	**Travis Block** 12.5%	267	8,300 0.5% growth for 2 years	0.34	A/B			8,556	0.35	A/B
Urban Residential Minor Arterial, 3 Lanes Volume Limit = 24750					**MC Block** 7.5%	195								
Existing Roadway Configuration					**3219 Knox Street** 10.0%	303								
Armstrong Avenue					**4510 Buena Vista** 25.0%	333				**Alliance Site** 70.0%	1,432			
Cole Avenue	**McKinney Avenue**	3,110	0.33	A/B	**Travis Block** 17.5%	373	4,756 0.5% growth for 2 years	0.50	C			6,188	0.65	D
Urban Residential Collector, 2 Lanes Volume Limit = 9500					**MC Block** 0.0%	0								
					3219 Knox Street 30.0%	909								

2025 Background					2025 Background plus Site				
Assignment	Daily Volume	Total Volume	V/C Ratio	LOS	Assignment	Daily Volume	Total Volume	V/C Ratio	LOS
4510 Buena Vista 25.0%	333				**Alliance Site** 12.5%	256			
Travis Block 12.5%	267	8,618 0.5% growth for 7 total years	0.35	A/B			8,874	0.36	A/B
MC Block 7.5%	195								
3219 Knox Street 10.0%	303								
4510 Buena Vista 25.0%	333				**Alliance Site** 70.0%	1,432			
Travis Block 17.5%	373	4,835 0.5% growth for 7 total years	0.51	C			6,267	0.66	D
MC Block 0.0%	0								
3219 Knox Street 30.0%	909								

I. Right-Turn Lane Analysis

Where justified, the addition of right-turn deceleration lanes can help inbound turning vehicles separate from the through traffic, avoiding conflicts and smoothing traffic flow. The City of Dallas and TxDOT has identified right-turning volume thresholds where right-turn lanes are justified. **Table 7** shows the driveway location with right-turn driveway access to the site, and how it compares with City and TxDOT standards. The high inbound volume occurs in the PM peak hour for the Driveway in this analysis. With the projected maximum peak hour right-turn volume not meeting City or TxDOT criterion, a right-turn lane is not recommended for the eastbound approach of Armstrong Avenue and the Driveway.

Table 7 – Right-Turn Lane Analysis

Right-Turn Location	Projected Maximum Peak Hour Right-Turn Volume	TxDOT Threshold (Access Management Manual, Table 2-3)	City of Dallas Threshold (Off-Street Parking and Driveways Handbook, III.A.5)	Right-Turn Lane Recommended?
Driveway from Armstrong Avenue	44 vph	60 vph	120 vph	No

V. PROJECT TRAFFIC CHARACTERISTICS: MCKINNEY-COLE TWO-WAY OPERATION

The previous traffic operations analysis was also performed on a roadway network in which Cole Avenue operates in its proposed two-way configuration, rather than in their current one-way couplet configuration. Because this conversion is proposed but not yet implemented, and therefore could occur before the 2020 study year or after the 2025 study year, both study years were analyzed with this configuration.

A. Two-Way Conversion Distribution Assumptions: McKinney-Cole Two-Way Conversion

With the proposed two-way conversion of McKinney Avenue and Cole Avenue, existing vehicle traffic would have the option to alter their route choices. From the McKinney-Cole Two-Way Conversion Study, it was assumed that two-thirds of the northbound traffic would still utilize McKinney Avenue, with one-third shifting to use the proposed northbound section of Cole Avenue. Likewise, two-thirds of the southbound traffic would still utilize Cole Avenue, with one-third shifting to use the proposed southbound section of McKinney Avenue. The east and westbound turning movements were developed using the same methodology.

The following three Subsections (B, C, and D) are repeated from Section III here for convenience. They have been updated to include Cole Avenue as a two-way street.

B. Site-Generated Traffic

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 9th edition of *Trip Generation Manual* published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. The trips indicated are actually one-way trips or *trip ends*, where one vehicle entering and exiting the site is counted as one inbound trip and one outbound trip.

A 5% reduction for multimodal use was taken due to the general mixed-use nature of the neighborhood and the proximity of the Katy Trail to the site (approximately 1,000 feet). NCTCOG has bicycle and pedestrian counters along the Katy Trail, with the nearest count stations at Fitzhugh Avenue to the south of Armstrong Avenue and at Harvard Avenue to the north. According to the 2016 Bicycle and Pedestrian Traffic Count report, the Katy Trail at Fitzhugh Avenue had 1,116,125 trips in 2016 with 81% pedestrians and 19% bicyclists. At the Katy Trail at Harvard Avenue count station, the report documented 573,225 trips in 2016 with approximately the same ratio of pedestrians to bicyclists. On average between the two count stations, the Katy Trail had 2,314 users per day.

No reductions were taken for pass-by trips or internal capture.

Table 8 shows the resulting daily and weekday AM and PM peak hour trip generation for the proposed development, showing new external trips.

Table 8 – Trip Generation

Land Uses	Amount	Units	ITE Code	Daily One-Way Trips	AM Peak Hour One-Way Trips			PM Peak Hour One-Way Trips		
					IN	OUT	TOTAL	IN	OUT	TOTAL
Apartment	335	Units	220	2,154	34	134	168	131	71	202

C. Trip Distribution and Assignment

The distribution of the site-generated traffic volumes into and out of the site driveway and onto the street system was based on the area street system characteristics, existing traffic patterns, relative residential density, and the locations of the proposed driveway access to/from the site. **Table 9** displays the general directional distribution percentages assumed for the site.

Table 9 – General Directional Distribution

Direction (To/From)	Percent of Site Traffic
North	40%
South	25%
East	25%
West	10%

The corresponding inbound and outbound traffic assignment, where the directional distribution in **Table 9** is applied using the most probable paths to and from the site, can be found in **Exhibit 12**. **Exhibit 13** shows the resulting site-generated weekday AM and weekday PM peak hour turning movements after multiplying the new external trip generation for each phase by the respective traffic assignment percentages.

Exhibit 11 shows the proposed lane configuration for the analysis after Cole Avenue has been converted to two-way operation.

D. Other Development Traffic Modelling: McKinney-Cole Two-Way Conversion

Using the same procedure as was used to develop the Alliance Cole Avenue site-generated traffic and distribute that traffic on the roadway network, traffic was developed and distributed for the Travis Block Site, the McKinney-Cole Block Site, the 4510 Buena Vista Site, and the 3219 Knox Street Site (Weir's Plaza). The distribution and volumes for each of these developments can be found in the **Appendix**.

E. Development of 2020 Background and Total Traffic: McKinney-Cole Two-Way Conversion

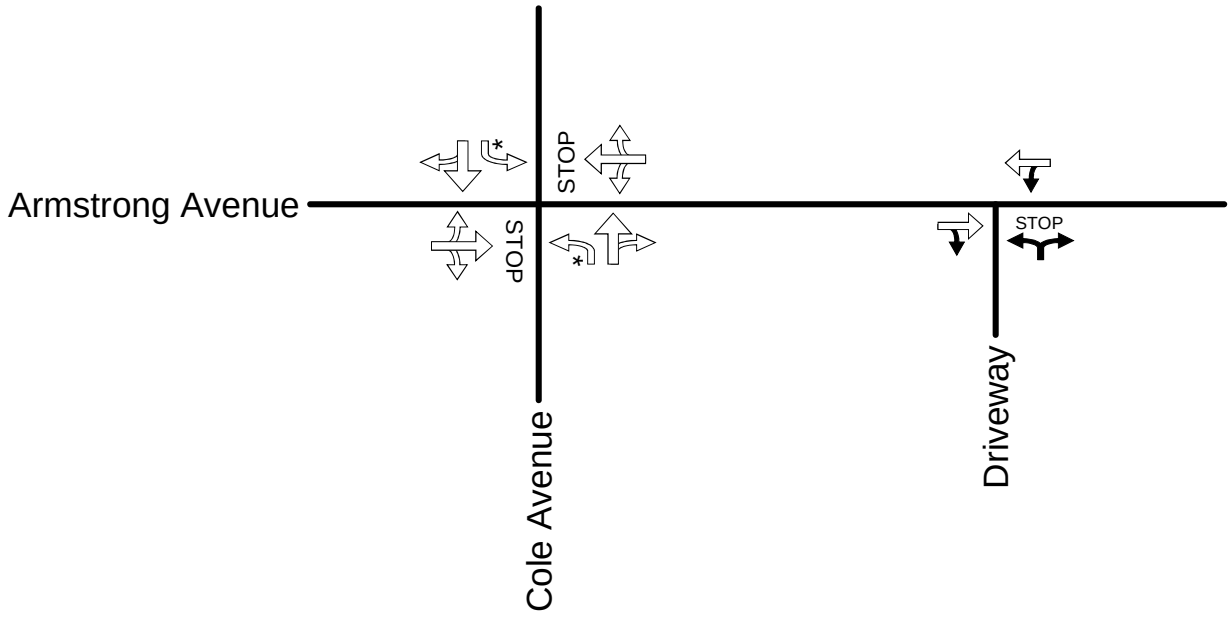
To obtain the 2020 two-way conversion traffic, the 2018 existing traffic volumes were redistributed to adjust for Cole Avenue becoming a two-way street, as previously described. A 0.5% annual growth rate was applied to these converted volumes for two years, and background developments from the area were added to the network to find the 2020 two-way background traffic, which is shown in **Exhibit 14**.

The site-generated traffic was then added to the background traffic to obtain the 2020 total traffic volumes. **Exhibit 15** shows the resulting total traffic volumes in the 2020 two-way conversion traffic scenario.

F. Development of 2025 Background and Total Traffic: McKinney-Cole Two-Way Conversion

To obtain the 2025 two-way conversion background traffic, the same 0.5% annual growth rate was applied to the converted 2018 volumes for seven years and the background site traffic was distributed throughout the network. **Exhibit 16** shows the resulting 2025 two-way background traffic volumes.

The site-generated traffic was then added to the background traffic to obtain the 2025 two-way total traffic volumes, shown in **Exhibit 17**.



LEGEND:

= Signalized Intersection

STOP = Stop-Controlled Approach

= Travel Lane

* = Turn Bay

= Driveway Lanes or Off-Site Improvements

TWLTL = Two-Way Left Turn Lane

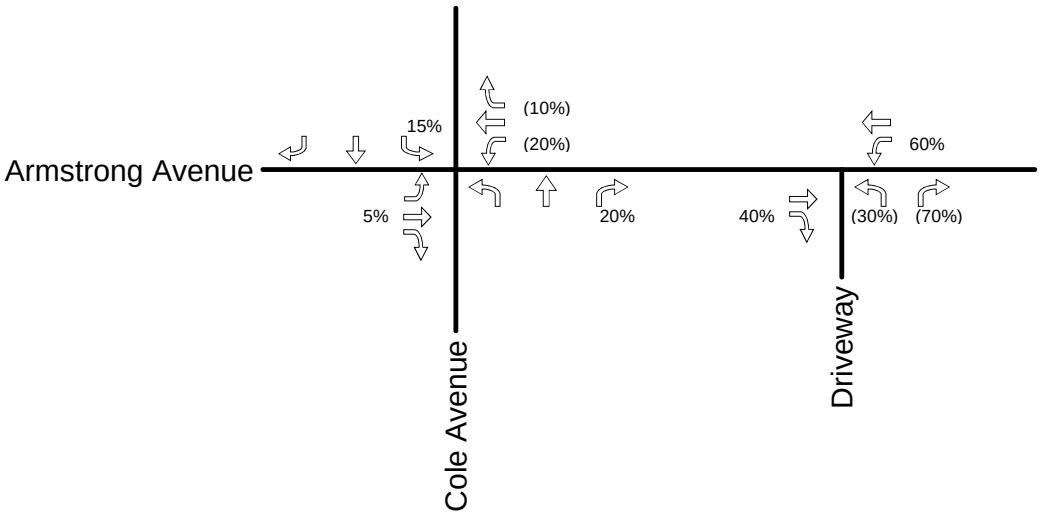
North

Not To Scale

EXHIBIT 11

Lane Assignment and Intersection Control - McKinney-Cole Conversion

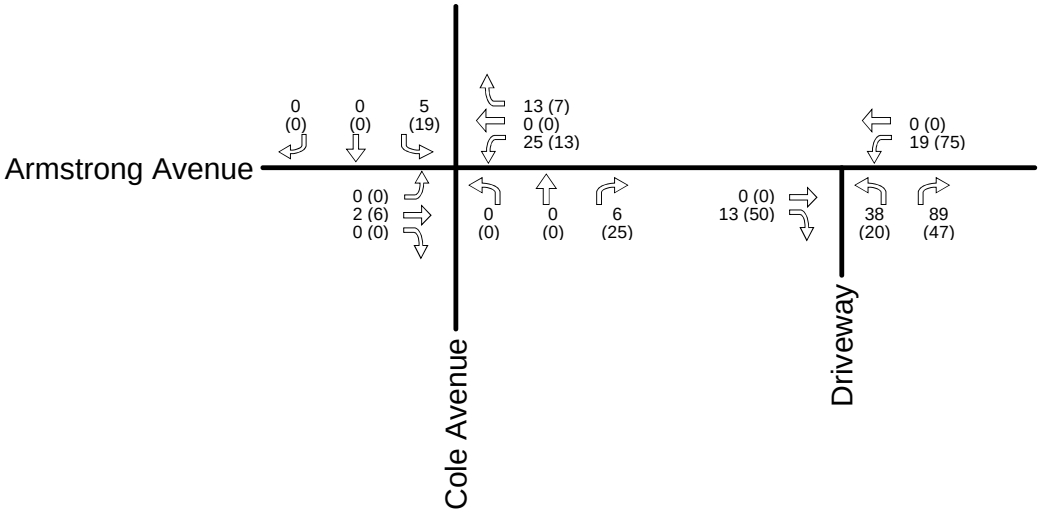
Kimley»Horn



LEGEND:
X% (Y%)
X% = Percentage of Inbound Site-Generated Traffic
(Y%) = Percentage of Outbound Site-Generated Traffic

North
Not To Scale

EXHIBIT 12
Trip Distribution and Traffic Assignment - McKinney-Cole Conversion



LEGEND:
X (Y)
X = Weekday AM Peak Hour Turning Movements
Y = Weekday PM Peak Hour Turning Movements
Volumes may not sum from point to point due to rounding and presence of smaller driveways not included in analysis.

North
Not To Scale

EXHIBIT 13
Site-Generated Trips - McKinney-Cole Conversion

Kimley»Horn

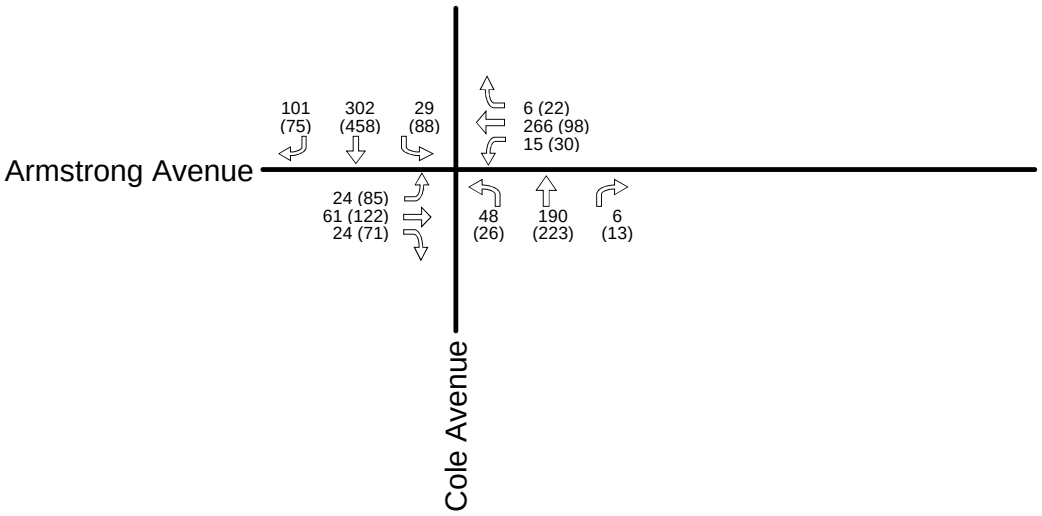


EXHIBIT 14

2020 Background Traffic Volumes - McKinney-Cole Conversion

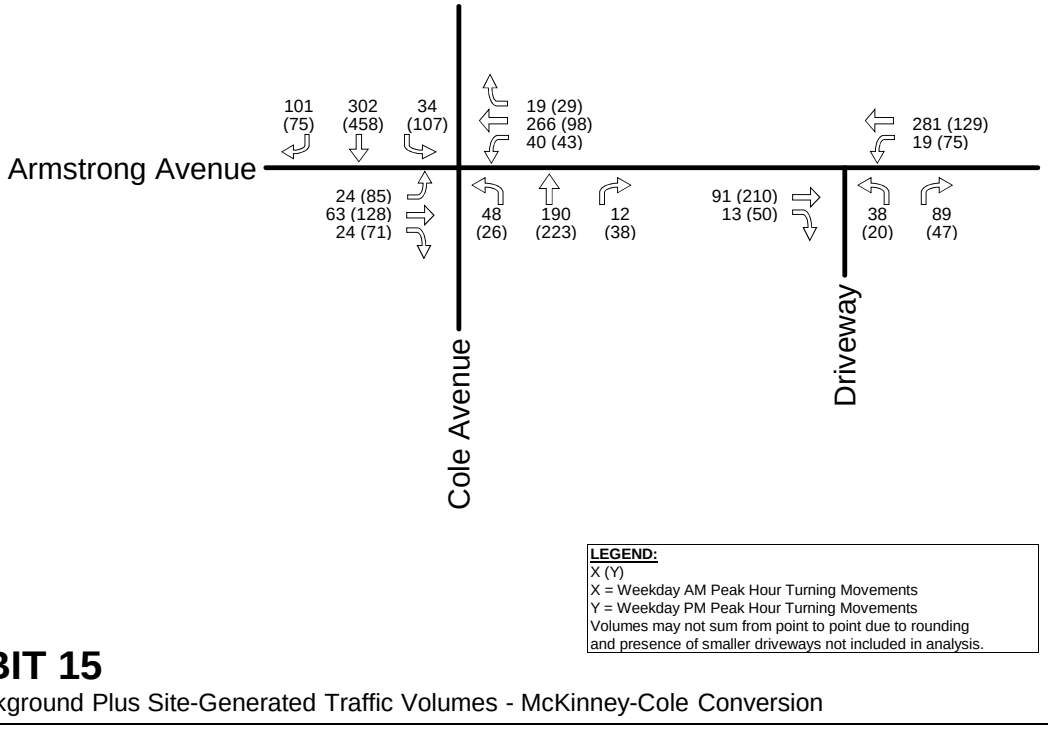


EXHIBIT 15

2020 Background Plus Site-Generated Traffic Volumes - McKinney-Cole Conversion

Kimley»Horn

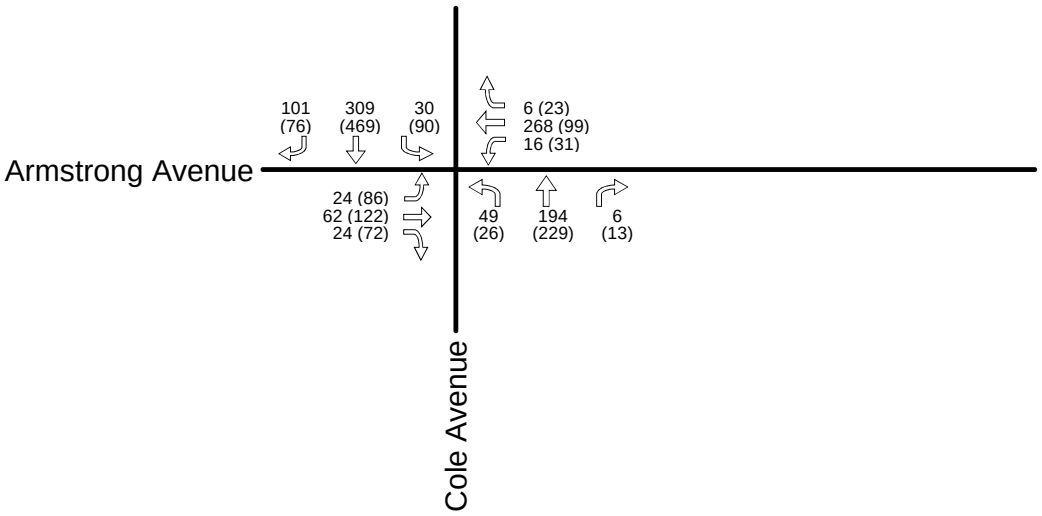


EXHIBIT 16

2025 Background Traffic Volumes - McKinney-Cole Conversion

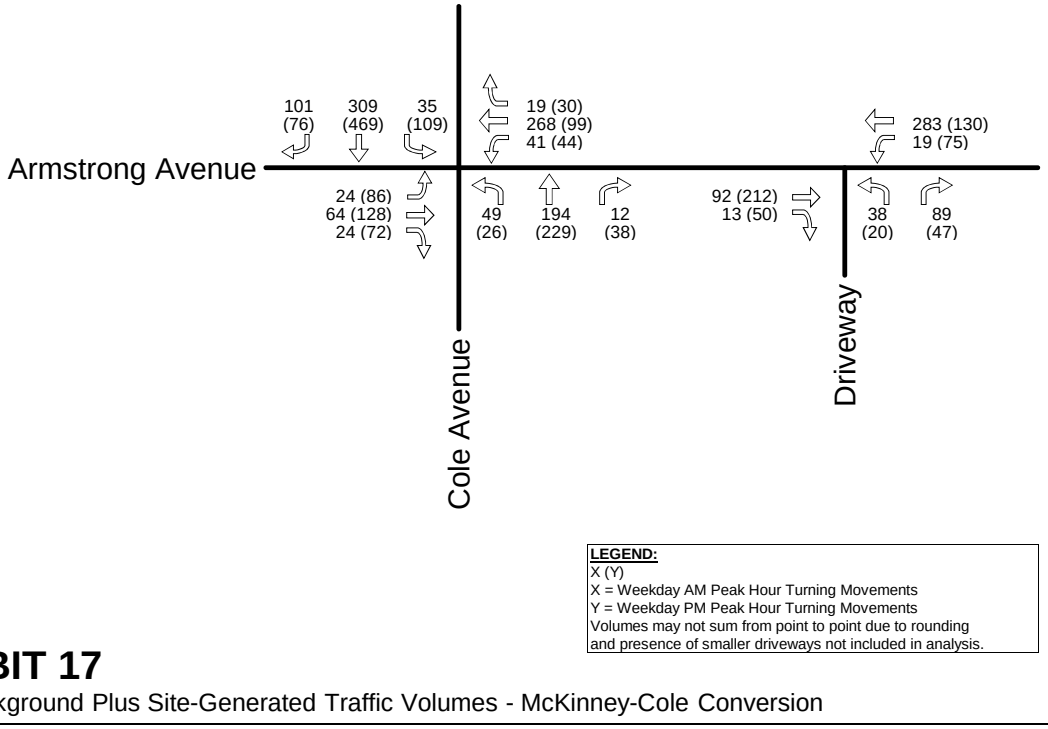


EXHIBIT 17

2025 Background Plus Site-Generated Traffic Volumes - McKinney-Cole Conversion

Kimley»Horn

VI. TRAFFIC OPERATIONS ANALYSIS: MCKINNEY-COLE TWO-WAY OPERATION

Kimley-Horn conducted a traffic operations analysis to determine potential capacity deficiencies in the 2018, 2020 and 2025 study years at the study intersections. The acknowledged source for determining overall capacity is the current edition of the *Highway Capacity Manual.* This same analysis has already been done for the roadway network, but has been updated below to account for the proposed conversion of Cole Avenue to two-way operation. The below information is repeated from Section IV of this report, but is included here for ease of reference.

A. Analysis Methodology: McKinney-Cole Two-Way Conversion

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). **Table 10** shows the definition of level of service for signalized and unsignalized intersections.

Table 10 – 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, Special Report 209, Transportation Research Board, 2010.

Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections. For the unsignalized analysis, the level of service (LOS) for a two-way stop-controlled intersection is defined for each movement. Unlike signalized intersections which define LOS for each approach and for the intersection as a whole, LOS for two-way stop-controlled intersections is not defined as a whole.

Calculations for the level of service at the key intersections identified for study are provided in the **Appendix**. The analyses assumed the lane geometry and intersection control shown in **Exhibit 11**.

B. Analysis Results: McKinney-Cole Two-Way Conversion

Table 11 and **Table 12** show the intersection operational results for the weekday AM and PM peak hours, respectively. Cole Avenue is analyzed in its proposed configuration as a two-way road.

Table 11 – Traffic Operational Results – Weekday AM Peak Hour: McKinney-Cole Conversion

INTERSECTION	APPROACH	2018 Existing Traffic		2020 Background Traffic		2020 Background plus Site Traffic		2025 Background Traffic		2025 Background plus Site Traffic	
		AM Peak Hour		AM Peak Hour		AM Peak Hour		AM Peak Hour		AM Peak Hour	
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Armstrong Avenue @ Cole Avenue **Cole Two-Way**	NBL	-	-	8.4	A	8.4	A	8.4	A	8.4	A
	EB*	-	-	200.0+	F	200.0+	F	200.0+	F	200.0+	F
	WB*	-	-	127.8	F	190.1	F	142.8	F	200.0+	F
	SBL	-	-	7.7	A	7.8	A	7.8	A	7.8	A
Armstrong Avenue @ Driveway	NB*	-	-	-	-	10.6	B	-	-	10.6	B
	WBL	-	-	-	-	7.5	A	-	-	7.5	A

* Stop-Controlled Approach - No movements in Time Period + Delay Exceeds 200 seconds

Background developments include the Knox Street Weir's development, the Buena Vista Street development, the Travis Block redevelopment, and the McKinney-Cole Block redevelopment north of Knox Street.

Table 12 – Traffic Operational Results – Weekday PM Peak Hour: McKinney-Cole Conversion

INTERSECTION	APPROACH	2018 Existing Traffic		2020 Background Traffic		2020 Background plus Site Traffic		2025 Background Traffic		2025 Background plus Site Traffic	
		PM Peak Hour		PM Peak Hour		PM Peak Hour		PM Peak Hour		PM Peak Hour	
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Armstrong Avenue @ Cole Avenue **Cole Two-Way**	NBL	-	-	8.8	A	8.8	A	8.8	A	8.8	A
	EB*	-	-	200.0+	F	200.0+	F	200.0+	F	200.0+	F
	WB*	-	-	161.5	F	200.0+	F	200.0+	F	200.0+	F
	SBL	-	-	8.0	A	8.1	A	8.0	A	8.1	A
Armstrong Avenue @ Driveway	NB*	-	-	-	-	11.3	B	-	-	11.3	B
	WBL	-	-	-	-	8.0	A	-	-	8.0	A

* Stop-Controlled Approach - No movements in Time Period + Delay Exceeds 200 seconds

Background developments include the Knox Street Weir's development, the Buena Vista Street development, the Travis Block redevelopment, and the McKinney-Cole Block redevelopment north of Knox Street.

C. 2020 Background Traffic Operations: McKinney-Cole Two-Way Conversion

During the AM peak hour, after the two-way conversion of Cole Avenue, the north- and southbound left-turning approaches to the intersection of Cole Avenue and Armstrong Avenue operate optimally during both peak hours. The east- and westbound approaches to the intersection experience a good deal of delay, operating at LOS F during both peak hours.

Due to the heavy delays of the Armstrong Avenue approaches at its intersection with Cole Avenue, a **Mitigation Analysis** will be performed later in this report.

D. 2020 Background Plus Site-Generated Traffic Operations: McKinney-Cole Two-Way Conversion

The addition of the site-generated traffic to the 2020 background traffic results in a small amount of extra delay at the existing intersection with no increases in level of service.

With the addition of site-generated traffic, the intersection of Armstrong Avenue with the Driveway operates favorably. Both the northbound approach and the westbound left-turning approach operate at LOS B or better during both peak hours.

E. 2025 Background Traffic Operations: McKinney-Cole Two-Way Conversion

After an additional five years of background traffic volume growth, the analysis of the 2025 background traffic operations shows that while there is some additional delay experienced by the approaches to the intersection of Cole Avenue and Armstrong Avenue, there are no changes in level of service from the 2020 background traffic analysis.

F. 2025 Background Plus Site-Generated Traffic Operations: McKinney-Cole Two-Way Conversion

The addition of the site-generated traffic to the 2025 background traffic results in no changes in level of service at the existing intersection of Cole Avenue and Armstrong Avenue.

With the addition of site-generated traffic, the intersection of Armstrong Avenue with the Driveway operates favorably. As was the case in the 2020 scenario, both the northbound approach and the westbound left-turning approach continue to operate at LOS B or better during both peak hours.

G. Link Volume Analysis: McKinney-Cole Two-Way Conversion

The following analysis has been adjusted from Section IV of this report to account for the conversion of Cole Avenue to two-way operation.

The link capacity analysis examines the operating conditions of roadway links rather than intersections, using the daily and peak hour volumes passing a fixed point. The operating condition is defined by the ratio of link volume to link capacity, or V/C. The V/C of the different roadway links that would be impacted by the proposed development's traffic was calculated for the 2018 existing traffic, 2020 background and background plus site traffic, and 2025 background and background plus site traffic scenarios. The daily link capacity for each roadway is taken from the NCTCOG model capacity volumes. The capacity for a two-way, urban residential minor arterial, such as Cole Avenue, is 750 vehicles per hour per lane (vphpl). The capacity for an undivided, urban residential collector road, such as Armstrong Avenue, is 475 vphpl.

Cole Avenue was analyzed in its proposed two-way configuration.

The link analyses, displayed in **Table 13**, show that under existing volumes, Cole Avenue would currently operate at LOS C. For all 2020 and 2025 scenarios, Cole Avenue operates at LOS C with its proposed two-way configuration.

Armstrong Avenue currently operates at LOS A/B. The addition of background traffic in 2020 changes the roadway from LOS A/B to C. With site-generated traffic, the link remains at LOS C during the 2020 scenario. Armstrong Avenue operates at LOS C during both the 2025 background and total traffic scenarios.

The addition of the project site traffic leaves the two roadway links with more than enough capacity to handle the future daily roadway volumes.

Table 13 – Link Operational Results: McKinney-Cole Conversion

Roadway Link		2018 Existing			2020 Background					2020 Background plus Site				
From	To	Volume	V/C Ratio	LOS	Assignment	Daily Volume	Total Volume	V/C Ratio	LOS	Assignment	Daily Volume	Total Volume	V/C Ratio	LOS
Cole Avenue					**4510 Buena Vista**	200				**Alliance Site**				
Knox Street	**Armstrong Avenue**	7,262	0.48	C	15.0%		8,182	0.55	C	12.5%	256	8,438	0.56	C
					Travis Block	320	0.5%							
Urban Residential Minor Arterial, 2 Lanes					15.0%		growth for 2							
Volume Limit = 15000					**MC Block**	130	years							
					5.0%									
After 2-Way Conversion					**3219 Knox Street**	197								
					6.5%									
Armstrong Avenue					**4510 Buena Vista**	333				**Alliance Site**				
Cole Avenue	**McKinney Avenue**	3,110	0.33	A/B	25.0%		4,756	0.50	C	65.0%	1,330	6,086	0.6406	C
					Travis Block	267	0.5%							
Urban Residential Collector, 2 Lanes					12.5%		growth for 2							
Volume Limit = 9500					**MC Block**	0	years							
					0.0%									
					3219 Knox Street	1,015								
					33.5%									

2025 Background					2025 Background plus Site				
Assignment	Daily Volume	Total Volume	V/C Ratio	LOS	Assignment	Daily Volume	Total Volume	V/C Ratio	LOS
4510 Buena Vista	333				**Alliance Site**				
25.0%		8,500	0.57	C	12.5%	256	8,756	0.58	C
Travis Block	320	0.5%							
15.0%		growth for 7							
MC Block	130	total years							
5.0%									
3219 Knox Street	197								
6.5%									
4510 Buena Vista	333				**Alliance Site**				
25.0%		4,835	0.51	C	65.0%	1,330	6,165	0.649	C
Travis Block	267	0.5%							
12.5%		growth for 7							
MC Block	0	total years							
0.0%									
3219 Knox Street	1,015								
33.5%									

H. Right-Turn Lane Analysis: McKinney-Cole Two-Way Conversion

Where justified, the addition of right-turn deceleration lanes can help inbound turning vehicles separate from the through traffic, avoiding conflicts and smoothing traffic flow. The City of Dallas and TxDOT has identified right-turning volume thresholds where right-turn lanes are justified. **Table 14** shows the driveway location with right-turn driveway access to the site, and how it compares with City and TxDOT standards. The high inbound volume occurs in the PM peak hour for the driveway in this analysis. With the projected maximum peak hour right-turn volume not meeting City or TxDOT criterion, a right-turn lane is not recommended for the eastbound approach of Armstrong Avenue and the Driveway.

Table 14 – Right-Turn Lane Analysis

Right-Turn Location	Projected Maximum Peak Hour Right-Turn Volume	TxDOT Threshold (Access Management Manual, Table 2-3)	City of Dallas Threshold (Off-Street Parking and Driveways Handbook, III.A.5)	Right-Turn Lane Recommended?
Driveway from Armstrong Avenue	50 vph	60 vph	120 vph	No

VII. TRAFFIC OPERATIONS ANALYSIS – MITIGATION

A mitigation analysis was performed on the following intersection identified for mitigation:

- Cole Avenue and Armstrong Avenue

The same analysis methodology was used as in Section IV of this report.

A. Mitigation Methodology

In order to mitigate the larger delays predicted in the initial analysis, Cole Avenue at Armstrong Avenue was analyzed as a signalized intersection. The signalization of both the intersections of Armstrong Avenue with Cole Avenue and Armstrong Avenue with McKinney Avenue have been a topic of discussion for some time now. Their signalization would improve pedestrian activity in the area, which is crucial to the Oak Lawn District.

The intersection was not analyzed as an all-way stop-controlled intersection. The intersection volumes are currently below the all-way stop-control warrant volumes, and once when the background developments are added to the system, the intersection volumes are expected to meet signal warrant volumes and all-way stop-control warrant volumes simultaneously. See below for the results of the signal warrant volume analysis.

B. Signal Warrant Results

The intersection of Cole Avenue and Armstrong Avenue was analyzed to determine if it would meet warrants under the following scenarios:

Cole Avenue as a one-way street (existing configuration)

- 2018 existing volumes
- 2018 existing volumes + background developments (mentioned earlier in report)
- 2018 existing volumes + background developments + Alliance Cole Avenue Site

Cole Avenue as a two-way street (proposed configuration)

- 2018 existing volumes
- 2018 existing volumes + background developments
- 2018 existing volumes + background developments + Alliance Cole Avenue Site

The results of the signal warrant analysis are summarized in **Table 15**. The intersection volumes do not currently meet any signal warrant criteria. With the upcoming background developments in the area, the intersection volumes are expected to meet the Warrant 1A (8-Hour Warrant) and Warrant 2 (4-Hour Warrant) thresholds. After the addition of the projected Alliance Cole Avenue site volumes, the intersection meets the same warrants more thoroughly.

Because the signal warrant thresholds are met without any Alliance Cole Avenue site traffic, a traffic signal should not be included as a requirement for the Alliance Cole Avenue site.

Table 15 – Signal Warrant Analysis Results

Scenario		Warrant 1A (8 - Hour)		Warrant 1B (8 - Hour)		Warrant 2 (4 - Hour)	
		Hours Met	Satisfied?	Hours Met	Satisfied?	Hours Met	Satisfied?
Cole Avenue and Mckinney Avenue Operating as **One-Way Couplets**	2018 Existing Traffic	0	No	0	No	0	No
	2018 Existing + Background Traffic	8	Yes	1	No	6	Yes
	2018 Existing + Background + Alliance (Cole/Armstong) Traffic	8	Yes	1	No	8	No
Cole Avenue and Mckinney Avenue Operating as **Two-Way Streets**	2018 Existing Traffic	0	No	0	No	0	No
	2018 Existing + Background Traffic	8	Yes	1	No	4	Yes
	2018 Existing + Background + Alliance (Cole/Armstong) Traffic	8	Yes	1	No	7	Yes

Background developments include the Buena Vista Street development, the Travis Block redevelopment, the Weir's Knox Street development, and the McKinney-Cole Block redevelopment north of Knox Street.

C. Mitigation Results – Cole Avenue as One-Way

Table 16 and **Table 17** show the changes in level of service resulting from the mitigation of the intersection of Cole Avenue and Armstrong Avenue. The existing one-way configuration of Cole Avenue was used for the analysis.

Table 16 – Mitigation Results – AM Peak Hour

INTERSECTION	APPROACH	2020 Background AM				2020 Background Plus Site AM				2025 Background AM				2025 Background Plus Site AM			
		AS PROPOSED		MITIGATIONS		AS PROPOSED		MITIGATIONS		AS PROPOSED		MITIGATIONS		AS PROPOSED		MITIGATIONS	
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Armstrong Avenue @ Cole Avenue **Cole One-Way** (Unsignalized)	EB*	18.4	C	-	-	19.1	C	-	-	18.9	C	-	-	19.8	C	-	-
	WB*	48.5	E	-	-	66.3	F	-	-	53.7	F	-	-	74.5	F	-	-
Armstrong Avenue @ Cole Avenue **Cole One-Way** (Signalized)	EB	-	-	21.3	C	-	-	19.9	B	-	-	21.3	C	-	-	19.9	B
	WB	-	-	23.7	C	-	-	23.0	C	-	-	23.7	C	-	-	23.0	C
	SB	-	-	11.6	B	-	-	12.4	B	-	-	11.7	B	-	-	12.6	B
	Overall	**-**	**-**	**15.6**	**B**	**-**	**-**	**16.0**	**B**	**-**	**-**	**15.6**	**B**	**-**	**-**	**16.0**	**B**

* Stop-Controlled Approach - No movements in Time Period

Background developments include the Knox Street Weir's development, the Buena Vista Street development, the Travis Block redevelopment, and the McKinney-Cole Block redevelopment north of Knox Street.

Table 17 – Mitigation Results – PM Peak Hour

INTERSECTION	APPROACH	2020 Background PM				2020 Background Plus Site PM				2025 Background PM				2025 Background Plus Site PM			
		AS PROPOSED		MITIGATIONS		AS PROPOSED		MITIGATIONS		AS PROPOSED		MITIGATIONS		AS PROPOSED		MITIGATIONS	
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Armstrong Avenue @ Cole Avenue **Cole One-Way** (Unsignalized)	EB*	200.0+	F	-	-	200.0+	F	-	-	200.0+	F	-	-	200.0+	F	-	-
	WB*	200.0+	F	-	-	200.0+	F	-	-	200.0+	F	-	-	200.0+	F	-	-
Armstrong Avenue @ Cole Avenue **Cole One-Way** (Signalized)	EB	-	-	22.9	C	-	-	20.6	C	-	-	22.6	C	-	-	20.3	C
	WB	-	-	20.1	C	-	-	20.4	C	-	-	20.1	C	-	-	20.4	C
	SB	-	-	13.4	B	-	-	14.6	B	-	-	13.6	B	-	-	14.9	B
	Overall	**-**	**-**	**16.0**	**B**	**-**	**-**	**16.4**	**B**	**-**	**-**	**16.1**	**B**	**-**	**-**	**16.6**	**B**

* Stop-Controlled Approach - No movements in Time Period + Delay Exceeds 200 seconds

Background developments include the Knox Street Weir's development, the Buena Vista Street development, the Travis Block redevelopment, and the McKinney-Cole Block redevelopment north of Knox Street.

D. 2020 Mitigation Traffic Operations

With and without background traffic, after the mitigatory traffic signal is in place, the intersection of Cole Avenue and Armstrong Avenue operates at LOS B during both peak hours. During the AM peak hour, the level of service for the westbound approach changed from LOS E to C. During the PM peak hour, both the east- and westbound approaches change from LOS F to C. The southbound approach operates at LOS B during all scenarios.

E. 2025 Mitigation Traffic Operations

The same mitigation procedure was performed using the 2025 background and background plus site-generated volumes. As in the 2020 mitigation scenario, after the signal is implemented for the intersection, the intersection operates at LOS B during both peak hours for all applied volumes. All approaches operate at LOS C or better.

F. Mitigation Results – Cole Avenue as Two-Way: MC Conversion

Table 18 and **Table 19** show the changes in level of service resulting from the mitigation of the intersection of Cole Avenue and Armstrong Avenue. The proposed two-way configuration of Cole Avenue was used for the analysis.

Table 18 – Mitigation Results – AM Peak Hour: MC Conversion

INTERSECTION	APPROACH	2020 Background AM				2020 Background Plus Site AM				2025 Background AM				2025 Background Plus Site AM			
		AS PROPOSED		MITIGATIONS		AS PROPOSED		MITIGATIONS		AS PROPOSED		MITIGATIONS		AS PROPOSED		MITIGATIONS	
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Armstrong Avenue @ Cole Avenue **Cole Two-Way** (Unsignalized)	NBL	8.4	A	-	-	8.4	A	-	-	8.4	A	-	-	8.4	A	-	-
	EB*	200.0+	F	-	-	200.0+	F	-	-	200.0+	F	-	-	200.0+	F	-	-
	WB*	127.8	F	-	-	190.1	F	-	-	142.8	F	-	-	200.0+	F	-	-
	SBL	7.7	A	-	-	7.8	A	-	-	7.8	A	-	-	7.8	A	-	-
Armstrong Avenue @ Cole Avenue **Cole Two-Way** (Signalized)	NB	-	-	6.0	A	-	-	6.9	A	-	-	6.1	A	-	-	7.0	A
	EB	-	-	19.3	B	-	-	18.1	B	-	-	19.2	B	-	-	18.0	B
	WB	-	-	22.8	C	-	-	22.2	C	-	-	22.8	C	-	-	22.1	C
	SB	-	-	3.7	A	-	-	4.6	A	-	-	3.8	A	-	-	4.7	A
	Overall	**-**	**-**	**10.9**	**B**	**-**	**-**	**11.5**	**B**	**-**	**-**	**10.9**	**B**	**-**	**-**	**11.5**	**B**

* Stop-Controlled Approach - No movements in Time Period + Delay Exceeds 200 seconds

Background developments include the Knox Street Weir's development, the Buena Vista Street development, the Travis Block redevelopment, and the McKinney-Cole Block redevelopment north of Knox Street.

Table 19 – Mitigation Results – PM Peak Hour: MC Conversion

INTERSECTION	APPROACH	2020 Background PM				2020 Background Plus Site PM				2025 Background PM				2025 Background Plus Site PM			
		AS PROPOSED		MITIGATIONS		AS PROPOSED		MITIGATIONS		AS PROPOSED		MITIGATIONS		AS PROPOSED		MITIGATIONS	
		DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS	DELAY (SEC/VEH)	LOS
Armstrong Avenue @ Cole Avenue **Cole Two-Way** (Unsignalized)	NBL	8.8	A	-	-	8.8	A	-	-	8.8	A	-	-	8.8	A	-	-
	EB*	200.0+	F	-	-	200.0+	F	-	-	200.0+	F	-	-	200.0+	F	-	-
	WB*	161.5	F	-	-	200.0+	F	-	-	200.0+	F	-	-	200.0+	F	-	-
	SBL	8.0	A	-	-	8.1	A	-	-	8.0	A	-	-	8.1	A	-	-
Armstrong Avenue @ Cole Avenue **Cole Two-Way** (Signalized)	NB	-	-	6.3	A	-	-	6.6	A	-	-	6.4	A	-	-	6.7	A
	EB	-	-	22.2	C	-	-	22.1	C	-	-	22.2	C	-	-	22.0	C
	WB	-	-	19.2	B	-	-	19.4	B	-	-	19.2	B	-	-	19.4	B
	SB	-	-	0.9	A	-	-	0.9	A	-	-	1.0	A	-	-	1.0	A
	Overall	**-**	**-**	**8.6**	**A**	**-**	**-**	**8.7**	**A**	**-**	**-**	**8.6**	**A**	**-**	**-**	**8.7**	**A**

* Stop-Controlled Approach - No movements in Time Period + Delay Exceeds 200 seconds

Background developments include the Knox Street Weir's development, the Buena Vista Street development, the Travis Block redevelopment, and the McKinney-Cole Block redevelopment north of Knox Street.

G. 2020 Mitigation Traffic Operations

With and without background traffic, after the mitigatory traffic signal is in place, the intersection of Cole Avenue and Armstrong Avenue operates at LOS B or better during both peak hours. During both peak hours, the level of service for both the Armstrong Avenue approaches changed from LOS F to C or better. The north- and southbound approaches operate at LOS A during all scenarios.

H. 2025 Mitigation Traffic Operations

The same mitigation procedure was performed using the 2025 background and background plus site-generated volumes. As in the 2020 mitigation scenario, after the signal is implemented for the intersection, the intersection operates at LOS B or better during both peak hours for all applied volumes. All approaches operate at LOS C or better.

VIII. CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis presented in this report, the proposed Alliance Cole Avenue residential site, located at the southeast corner of Cole Avenue and Armstrong Avenue in Dallas, TX, can be successfully incorporated into the surrounding roadway network. The proposed site driveways provide the appropriate level of access for the development. The site-generated traffic does not significantly affect the existing traffic operations.

The existing traffic volumes of the intersection of Cole Avenue and Armstrong Avenue do not meet volume thresholds for all-way stop-control warrants or signal warrants. With the background developments in the area, signal warrants are expected to be met without any site-generated traffic from the Alliance Cole Avenue site, so a signal cannot be the sole responsibility of the development. Even though the signal is not a condition for the Alliance Cole Avenue development, the project should be a part of the signalization effort which will benefit the neighborhood. The signal is the only real means for mitigating the unfavorable and growing delays experienced by Armstrong Avenue traffic and pedestrians. This signal will be even more important for east-west vehicle movement and pedestrian movement in the future.

APPENDIX

Kimley»Horn

Traffic Counts and Historical Data

Cole Avenue (Between Armstrong and Knox)						
Record	**Year**	**Link Start**	**Link End**	**Source**	**24-Hour Volume**	**Annual Growth Rate**
1	2015	Armstrong	Knox	KH	5,805	-
2	2018	Armstrong	Knox	KH	7,262	7.8%

Cole Avenue (Between Armstrong and Oliver)						
Record	**Year**	**Link Start**	**Link End**	**Source**	**24-Hour Volume**	**Annual Growth Rate**
1	2004	Armstrong	Oliver	City of Dallas	5,350	-
2	2018	Armstrong	Oliver	KH	6,263	1.1%

Armstrong Avenue (Between Travis and Cole)						
Record	**Year**	**Link Start**	**Link End**	**Source**	**24-Hour Volume**	**Annual Growth Rate**
1	2015	Travis	Cole	KH	2,334	-
2	2017	Travis	Cole	KH	2,075	-5.7%
3	2018	Travis	Cole	KH	1,857	-10.5%
					Average Growth 2015 - 2018:	**-7.3%**

Armstrong Avenue (Between Cole and McKinney)						
Record	**Year**	**Link Start**	**Link End**	**Source**	**24-Hour Volume**	**Annual Growth Rate**
1	2015	Cole	McKinney	KH	3,099	-
2	2018	Cole	McKinney	KH	3,110	0.1%

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Count Name: Cole Avenue & Armstrong Avenue (pt 1)
Site Code:
Start Date: 01/10/2018

Turning Movement Data

Start Time	Cole Avenue Southbound					Armstrong Avenue Westbound					Cole avenue Northbound		Armstrong Avenue Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Thru	Left	U-Turn	Peds	App. Total	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
12:00 AM	0	10	4	1	14	0	0	0	0	0	0	0	0	0	0	0	0	14
12:15 AM	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
12:30 AM	0	6	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	6
12:45 AM	1	4	0	0	5	0	0	0	0	0	0	0	0	0	0	1	0	5
Hourly Total	1	21	5	1	27	0	0	0	0	0	0	0	0	0	0	1	0	27
1:00 AM	0	3	0	0	3	0	1	0	0	1	0	0	0	2	0	0	2	6
1:15 AM	0	2	0	0	2	2	1	0	0	3	0	0	0	0	0	0	0	5
1:30 AM	0	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
1:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
Hourly Total	0	6	2	0	8	2	2	0	0	4	0	0	0	3	0	0	3	15
2:00 AM	0	3	0	0	3	1	1	0	0	2	0	0	0	0	0	0	0	5
2:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30 AM	0	0	1	0	1	1	1	0	0	2	0	0	0	0	0	0	0	3
2:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Hourly Total	0	5	1	0	6	2	2	0	0	4	0	0	0	0	0	0	0	10
3:00 AM	0	1	1	0	2	0	0	0	0	0	0	0	0	2	0	0	2	4
3:15 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	2
3:30 AM	0	0	0	0	0	1	2	0	0	3	0	0	0	0	0	0	0	3
3:45 AM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1
Hourly Total	0	2	1	0	3	2	2	0	0	4	0	0	0	3	0	0	3	10
4:00 AM	0	3	0	0	3	0	1	0	0	1	0	0	0	0	0	0	0	4
4:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 AM	0	3	0	0	3	1	0	0	0	1	0	0	0	2	0	0	2	6
4:45 AM	0	2	1	0	3	0	1	0	0	1	0	0	0	1	0	0	1	5
Hourly Total	0	8	1	0	9	1	2	0	0	3	0	0	0	3	0	0	3	15
5:00 AM	0	6	1	0	7	2	0	0	0	2	0	0	0	2	0	0	2	11
5:15 AM	1	4	0	2	5	2	0	0	0	2	1	0	0	0	0	0	0	7
5:30 AM	2	12	1	0	15	0	0	0	0	0	1	0	0	1	0	0	1	16
5:45 AM	1	21	0	0	22	3	0	0	0	3	1	0	0	0	0	0	0	25
Hourly Total	4	43	2	2	49	7	0	0	0	7	3	0	0	3	0	0	3	59
6:00 AM	1	15	2	0	18	4	0	0	0	4	0	0	0	2	0	0	2	24
6:15 AM	2	22	1	1	25	1	1	0	0	2	1	0	1	1	0	2	2	29
6:30 AM	1	22	1	2	24	1	1	0	0	2	0	0	2	1	0	0	3	29
6:45 AM	3	31	4	0	38	5	5	0	0	10	2	0	1	2	0	2	3	51
Hourly Total	7	90	8	3	105	11	7	0	0	18	3	0	4	6	0	4	10	133
7:00 AM	2	55	5	2	62	1	2	0	0	3	2	0	2	4	0	0	6	71
7:15 AM	1	67	7	2	75	0	2	0	1	2	2	0	4	1	0	0	5	82
7:30 AM	2	84	6	0	92	2	9	0	0	11	0	0	1	6	0	0	7	110

7:45 AM	3	85	22	1	110	3	7	0	2	10	1	0	3	16	0	1	19	139
Hourly Total	8	291	40	5	339	6	20	0	3	26	5	0	10	27	0	1	37	402
8:00 AM	7	93	14	1	114	4	1	0	0	5	0	0	0	11	0	0	11	130
8:15 AM	2	113	23	2	138	9	6	0	0	15	1	0	6	14	0	0	20	173
8:30 AM	2	116	14	1	132	6	2	0	1	8	1	0	2	12	0	1	14	154
8:45 AM	5	118	22	4	145	6	9	0	0	15	0	0	2	10	0	1	12	172
Hourly Total	16	440	73	8	529	25	18	0	1	43	2	0	10	47	0	2	57	629
9:00 AM	7	91	18	1	116	5	6	0	0	11	2	0	3	4	0	0	7	134
9:15 AM	4	77	16	1	97	8	6	0	0	14	0	0	3	11	0	1	14	125
9:30 AM	3	52	12	2	67	7	5	0	4	12	0	0	3	5	0	4	8	87
9:45 AM	6	38	15	5	59	5	4	0	3	9	0	0	3	9	0	0	12	80
Hourly Total	20	258	61	9	339	25	21	0	7	46	2	0	12	29	0	5	41	426
10:00 AM	5	48	17	1	70	8	6	0	2	14	1	0	4	9	0	1	13	97
10:15 AM	5	40	18	2	63	3	8	0	1	11	1	0	5	7	0	2	12	86
10:30 AM	9	40	24	1	73	9	3	0	0	12	1	0	0	11	0	2	11	96
10:45 AM	10	50	29	3	89	4	6	0	0	10	0	0	3	7	1	2	11	110
Hourly Total	29	178	88	7	295	24	23	0	3	47	3	0	12	34	1	7	47	389
11:00 AM	10	50	33	0	93	7	4	0	0	11	0	0	4	14	0	1	18	122
11:15 AM	8	52	34	1	94	7	5	0	0	12	2	0	2	7	0	4	9	115
11:30 AM	8	73	32	7	113	2	12	0	2	14	0	0	3	9	1	1	13	140
11:45 AM	8	64	42	2	114	7	11	0	0	18	1	0	6	17	0	0	23	155
Hourly Total	34	239	141	10	414	23	32	0	2	55	3	0	15	47	1	6	63	532
12:00 PM	18	81	34	4	133	6	14	0	0	20	1	0	4	10	0	2	14	167
12:15 PM	12	74	28	11	114	9	9	0	0	18	1	0	8	14	0	1	22	154
12:30 PM	8	76	28	1	112	14	19	0	0	33	2	0	1	7	0	1	8	153
12:45 PM	11	99	32	5	142	11	24	0	0	35	2	0	7	13	0	3	20	197
Hourly Total	49	330	122	21	501	40	66	0	0	106	6	0	20	44	0	7	64	671
1:00 PM	15	76	37	5	128	13	16	0	2	29	2	0	7	11	0	3	18	175
1:15 PM	9	81	36	1	126	9	23	0	1	32	7	0	4	7	0	10	11	169
1:30 PM	11	56	37	3	104	14	17	0	2	31	4	0	5	13	0	4	18	153
1:45 PM	7	67	40	1	114	10	8	0	2	18	0	0	5	9	0	2	14	146
Hourly Total	42	280	150	10	472	46	64	0	7	110	13	0	21	40	0	19	61	643
2:00 PM	6	108	28	0	142	15	15	0	0	30	0	0	4	13	0	3	17	189
2:15 PM	9	167	19	3	195	6	19	0	0	25	0	0	7	9	0	3	16	236
2:30 PM	8	122	29	0	159	7	19	0	0	26	0	0	6	9	0	1	15	200
2:45 PM	10	114	27	6	151	19	19	0	0	38	0	0	7	11	0	2	18	207
Hourly Total	33	511	103	9	647	47	72	0	0	119	0	0	24	42	0	9	66	832
3:00 PM	10	128	29	3	167	13	20	0	0	33	1	0	8	17	0	5	25	225
3:15 PM	8	96	21	5	125	11	12	0	0	23	0	0	8	11	0	3	19	167
3:30 PM	13	71	22	2	106	7	5	0	1	12	0	0	5	11	0	3	16	134
Grand Total	274	2997	870	95	4141	292	368	0	24	660	41	0	149	367	2	72	518	5319
Approach %	6.6	72.4	21.0	-	-	44.2	55.8	0.0	-	-	-	-	28.8	70.8	0.4	-	-	-
Total %	5.2	56.3	16.4	-	77.9	5.5	6.9	0.0	-	12.4	-	0.0	2.8	6.9	0.0	-	9.7	-
Lights	265	2941	853	-	4059	286	364	0	-	650	-	0	145	356	2	-	503	5212
% Lights	96.7	98.1	98.0	-	98.0	97.9	98.9	-	-	98.5	-	-	97.3	97.0	100.0	-	97.1	98.0
Mediums	9	54	15	-	78	5	4	0	-	9	-	0	4	10	0	-	14	101
% Mediums	3.3	1.8	1.7	-	1.9	1.7	1.1	-	-	1.4	-	-	2.7	2.7	0.0	-	2.7	1.9
Articulated Trucks	0	2	2	-	4	1	0	0	-	1	-	0	0	1	0	-	1	6
% Articulated Trucks	0.0	0.1	0.2	-	0.1	0.3	0.0	-	-	0.2	-	-	0.0	0.3	0.0	-	0.2	0.1
Bicycles on Crosswalk	-	-	-	2	-	-	-	-	0	-	0	-	-	-	-	2	-	-
% Bicycles on Crosswalk	-	-	-	2.1	-	-	-	-	0.0	-	0.0	-	-	-	-	2.8	-	-
Pedestrians	-	-	-	93	-	-	-	-	24	-	41	-	-	-	-	70	-	-

% Pedestrians	-	-	-	97.9	-	-	-	-	100.0	-	100.0	-	-	-	-	97.2	-	-

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Count Name: Cole Avenue & Armstrong Avenue (pt 1)
Site Code:
Start Date: 01/10/2018

Turning Movement Peak Hour Data (8:15 AM)

Start Time	Cole Avenue Southbound					Armstrong Avenue Westbound					Cole avenue Northbound		Armstrong Avenue Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Thru	Left	U-Turn	Peds	App. Total	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	
8:15 AM	2	113	23	2	138	9	6	0	0	15	1	0	6	14	0	0	20	173
8:30 AM	2	116	14	1	132	6	2	0	1	8	1	0	2	12	0	1	14	154
8:45 AM	5	118	22	4	145	6	9	0	0	15	0	0	2	10	0	1	12	172
9:00 AM	7	91	18	1	116	5	6	0	0	11	2	0	3	4	0	0	7	134
Total	16	438	77	8	531	26	23	0	1	49	4	0	13	40	0	2	53	633
Approach %	3.0	82.5	14.5	-	-	53.1	46.9	0.0	-	-	-	-	24.5	75.5	0.0	-	-	-
Total %	2.5	69.2	12.2	-	83.9	4.1	3.6	0.0	-	7.7	-	0.0	2.1	6.3	0.0	-	8.4	-
PHF	0.571	0.928	0.837	-	0.916	0.722	0.639	0.000	-	0.817	-	0.000	0.542	0.714	0.000	-	0.663	0.915
Lights	15	432	75	-	522	25	22	0	-	47	-	0	12	39	0	-	51	620
% Lights	93.8	98.6	97.4	-	98.3	96.2	95.7	-	-	95.9	-	-	92.3	97.5	-	-	96.2	97.9
Mediums	1	5	2	-	8	1	1	0	-	2	-	0	1	1	0	-	2	12
% Mediums	6.3	1.1	2.6	-	1.5	3.8	4.3	-	-	4.1	-	-	7.7	2.5	-	-	3.8	1.9
Articulated Trucks	0	1	0	-	1	0	0	0	-	0	-	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.2	0.0	-	0.2	0.0	0.0	-	-	0.0	-	-	0.0	0.0	-	-	0.0	0.2
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	0.0	-	-	-	-	0.0	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	8	-	-	-	-	1	-	4	-	-	-	-	2	-	-
% Pedestrians	-	-	-	100.0	-	-	-	-	100.0	-	100.0	-	-	-	-	100.0	-	-

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Count Name: Cole Avenue & Armstrong Avenue (pt 1)
Site Code:
Start Date: 01/10/2018

Turning Movement Peak Hour Data (2:15 PM)

Start Time	Cole Avenue Southbound					Armstrong Avenue Westbound					Cole avenue Northbound		Armstrong Avenue Eastbound					
	Right	Thru	Left	Peds	App. Total	Thru	Left	U-Turn	Peds	App. Total	Peds	App. Total	Right	Thru	U-Turn	Peds	App. Total	Int. Total
2:15 PM	9	167	19	3	195	6	19	0	0	25	0	0	7	9	0	3	16	236
2:30 PM	8	122	29	0	159	7	19	0	0	26	0	0	6	9	0	1	15	200
2:45 PM	10	114	27	6	151	19	19	0	0	38	0	0	7	11	0	2	18	207
3:00 PM	10	128	29	3	167	13	20	0	0	33	1	0	8	17	0	5	25	225
Total	37	531	104	12	672	45	77	0	0	122	1	0	28	46	0	11	74	868
Approach %	5.5	79.0	15.5	-	-	36.9	63.1	0.0	-	-	-	-	37.8	62.2	0.0	-	-	-
Total %	4.3	61.2	12.0	-	77.4	5.2	8.9	0.0	-	14.1	-	0.0	3.2	5.3	0.0	-	8.5	-
PHF	0.925	0.795	0.897	-	0.862	0.592	0.963	0.000	-	0.803	-	0.000	0.875	0.676	0.000	-	0.740	0.919
Lights	36	526	103	-	665	45	77	0	-	122	-	0	27	44	0	-	71	858
% Lights	97.3	99.1	99.0	-	99.0	100.0	100.0	-	-	100.0	-	-	96.4	95.7	-	-	95.9	98.8
Mediums	1	5	0	-	6	0	0	0	-	0	-	0	1	1	0	-	2	8
% Mediums	2.7	0.9	0.0	-	0.9	0.0	0.0	-	-	0.0	-	-	3.6	2.2	-	-	2.7	0.9
Articulated Trucks	0	0	1	-	1	0	0	0	-	0	-	0	0	1	0	-	1	2
% Articulated Trucks	0.0	0.0	1.0	-	0.1	0.0	0.0	-	-	0.0	-	-	0.0	2.2	-	-	1.4	0.2
Bicycles on Crosswalk	-	-	-	1	-	-	-	-	0	-	0	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	8.3	-	-	-	-	-	-	0.0	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	11	-	-	-	-	0	-	1	-	-	-	-	11	-	-
% Pedestrians	-	-	-	91.7	-	-	-	-	-	-	100.0	-	-	-	-	100.0	-	-

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Count Name: Cole Avenue at Armstrong Avenue (pt 2)
Site Code:
Start Date: 01/11/2018

Turning Movement Data

Start Time	Cole Avenue Southbound						Armstrong Avenue Westbound						Cole Avenue Northbound						Armstrong Avenue Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
3:45 PM	13	70	13	0	1	96	11	10	1	0	1	22	0	0	0	0	1	0	0	14	4	0	6	18	136
Hourly Total	13	70	13	0	1	96	11	10	1	0	1	22	0	0	0	0	1	0	0	14	4	0	6	18	136
4:00 PM	16	106	9	0	1	131	10	9	0	0	2	19	0	0	0	0	1	0	0	11	4	0	2	15	165
4:15 PM	30	113	9	0	0	152	10	8	1	0	2	19	0	0	0	0	0	0	0	12	11	0	4	23	194
4:30 PM	31	131	12	0	2	174	8	11	0	0	1	19	0	0	0	0	0	0	0	11	7	0	1	18	211
4:45 PM	28	151	12	0	0	191	8	7	0	0	1	15	0	0	0	0	0	0	0	9	5	0	0	14	220
Hourly Total	105	501	42	0	3	648	36	35	1	0	6	72	0	0	0	0	1	0	0	43	27	0	7	70	790
5:00 PM	26	145	20	0	2	191	15	9	0	0	1	24	0	0	0	0	1	0	0	12	8	0	0	20	235
5:15 PM	37	171	11	0	6	219	9	8	0	0	1	17	0	0	0	0	1	0	0	11	5	0	4	16	252
5:30 PM	35	184	11	0	11	230	13	7	0	0	6	20	0	0	0	0	3	0	0	14	9	1	3	24	274
5:45 PM	33	140	8	0	4	181	8	8	0	0	3	16	0	0	0	0	2	0	0	17	11	0	2	28	225
Hourly Total	131	640	50	0	23	821	45	32	0	0	11	77	0	0	0	0	7	0	0	54	33	1	9	88	986
6:00 PM	15	122	17	0	0	154	7	5	0	0	0	12	0	0	0	0	1	0	0	5	4	0	2	9	175
6:15 PM	29	139	14	0	4	182	9	3	0	0	2	12	0	0	0	0	1	0	0	12	9	0	4	21	215
6:30 PM	33	114	13	0	6	160	10	7	0	0	0	17	0	0	0	0	1	0	0	12	3	0	4	15	192
6:45 PM	28	90	8	0	1	126	19	13	0	0	2	32	0	0	0	0	0	0	0	8	5	1	3	14	172
Hourly Total	105	465	52	0	11	622	45	28	0	0	4	73	0	0	0	0	3	0	0	37	21	1	13	59	754
7:00 PM	26	76	12	0	2	114	13	6	0	0	1	19	0	0	0	0	0	0	0	9	2	0	2	11	144
7:15 PM	28	75	12	0	3	115	12	10	0	0	3	22	0	0	0	0	1	0	0	12	3	0	2	15	152
7:30 PM	19	74	6	0	5	99	14	6	0	0	0	20	0	0	0	0	2	0	0	7	4	0	7	11	130
7:45 PM	14	55	3	0	0	72	13	4	0	1	1	18	0	0	0	0	0	0	0	7	6	1	3	14	104
Hourly Total	87	280	33	0	10	400	52	26	0	1	5	79	0	0	0	0	3	0	0	35	15	1	14	51	530
8:00 PM	17	54	8	0	0	79	8	6	0	1	0	15	0	0	0	0	1	0	0	8	5	0	2	13	107
8:15 PM	12	55	7	0	4	74	8	4	0	0	1	12	0	0	0	0	0	0	0	7	6	0	2	13	99
8:30 PM	11	49	7	0	1	67	12	5	0	0	0	17	0	0	0	0	0	0	0	8	0	0	0	8	92
8:45 PM	13	44	7	0	1	64	6	3	0	0	0	9	0	0	0	0	0	0	0	2	2	0	3	4	77
Hourly Total	53	202	29	0	6	284	34	18	0	1	1	53	0	0	0	0	1	0	0	25	13	0	7	38	375
9:00 PM	12	47	8	0	0	67	10	6	0	0	0	16	0	0	0	0	1	0	0	7	0	0	1	7	90
9:15 PM	8	50	1	0	2	59	5	2	0	0	0	7	0	0	0	0	0	0	0	9	2	0	0	11	77
9:30 PM	8	38	2	0	0	48	5	5	0	0	0	10	0	0	0	0	0	0	0	3	4	0	2	7	65
9:45 PM	6	33	3	0	0	42	3	1	0	0	0	4	0	0	0	0	0	0	0	5	3	0	0	8	54
Hourly Total	34	168	14	0	2	216	23	14	0	0	0	37	0	0	0	0	1	0	0	24	9	0	3	33	286
10:00 PM	10	24	1	0	3	35	5	4	0	0	0	9	0	0	0	0	0	0	0	5	4	0	0	9	53
10:15 PM	3	21	0	0	4	24	7	2	0	1	0	10	0	0	0	0	0	0	0	11	3	0	1	14	48
10:30 PM	3	13	2	0	0	18	3	2	0	0	0	5	0	0	0	0	0	0	0	4	1	0	0	5	28
10:45 PM	0	18	0	0	0	18	3	2	0	0	0	5	0	0	0	0	0	0	0	1	2	0	0	3	26
Hourly Total	16	76	3	0	7	95	18	10	0	1	0	29	0	0	0	0	0	0	0	21	10	0	1	31	155
11:00 PM	4	9	2	0	0	15	4	2	0	0	0	6	0	0	0	0	0	0	0	1	1	0	0	2	23
11:15 PM	2	6	4	0	0	12	0	1	0	0	0	1	0	0	0	0	0	0	0	1	1	0	0	2	15
11:30 PM	3	6	1	0	0	10	1	1	0	0	0	2	0	0	0	0	0	0	0	1	1	0	0	2	14
11:45 PM	2	10	1	0	0	13	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	15
Hourly Total	11	31	8	0	0	50	6	4	0	0	0	10	0	0	0	0	0	0	0	4	3	0	0	7	67
Grand Total	555	2433	244	0	63	3232	270	177	2	3	28	452	0	0	0	0	17	0	0	257	135	3	60	395	4079
Approach %	17.2	75.3	7.5	0.0	-	-	59.7	39.2	0.4	0.7	-	-	0.0	0.0	0.0	0.0	-	-	0.0	65.1	34.2	0.8	-	-	-
Total %	13.6	59.6	6.0	0.0	-	79.2	6.6	4.3	0.0	0.1	-	11.1	0.0	0.0	0.0	0.0	-	0.0	0.0	6.3	3.3	0.1	-	9.7	-
Lights	552	2410	241	0	-	3203	269	175	2	3	-	449	0	0	0	0	-	0	0	255	134	3	-	392	4044
% Lights	99.5	99.1	98.8	-	-	99.1	99.6	98.9	100.0	100.0	-	99.3	-	-	-	-	-	-	-	99.2	99.3	100.0	-	99.2	99.1
Mediums	3	20	2	0	-	25	1	2	0	0	-	3	0	0	0	0	-	0	0	2	1	0	-	3	31
% Mediums	0.5	0.8	0.8	-	-	0.8	0.4	1.1	0.0	0.0	-	0.7	-	-	-	-	-	-	-	0.8	0.7	0.0	-	0.8	0.8
Articulated Trucks	0	3	1	0	-	4	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	4
% Articulated Trucks	0.0	0.1	0.4	-	-	0.1	0.0	0.0	0.0	0.0	-	0.0	-	-	-	-	-	-	-	0.0	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	1.6	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	62	-	-	-	-	-	28	-	-	-	-	-	17	-	-	-	-	-	60	-	-
% Pedestrians	-	-	-	-	98.4	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

CJ Hensch & Associates, Inc.
kh@cjhensch.com
5215 Sycamore Ave

Pasadena, Texas, United States 77503
281-487-5417

Count Name: Cole Avenue at Armstrong Avenue (pt 2)
Site Code:
Start Date: 01/11/2018

Turning Movement Peak Hour Data (5:00 PM)

Start Time	Cole Avenue Southbound						Armstrong Avenue Westbound						Cole Avenue Northbound						Armstrong Avenue Eastbound						Int. Total
	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	Left	Thru	Right	U-Turn	Peds	App. Total	
5:00 PM	26	145	20	0	2	191	15	9	0	0	1	24	0	0	0	0	1	0	0	12	8	0	0	20	235
5:15 PM	37	171	11	0	6	219	9	8	0	0	1	17	0	0	0	0	1	0	0	11	5	0	4	16	252
5:30 PM	35	184	11	0	11	230	13	7	0	0	6	20	0	0	0	0	3	0	0	14	9	1	3	24	274
5:45 PM	33	140	8	0	4	181	8	8	0	0	3	16	0	0	0	0	2	0	0	17	11	0	2	28	225
Total	131	640	50	0	23	821	45	32	0	0	11	77	0	0	0	0	7	0	0	54	33	1	9	88	986
Approach %	16.0	78.0	6.1	0.0	-	-	58.4	41.6	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	0.0	61.4	37.5	1.1	-	-	-
Total %	13.3	64.9	5.1	0.0	-	83.3	4.6	3.2	0.0	0.0	-	7.8	0.0	0.0	0.0	0.0	-	0.0	0.0	5.5	3.3	0.1	-	8.9	-
PHF	0.885	0.870	0.625	0.000	-	0.892	0.750	0.889	0.000	0.000	-	0.802	0.000	0.000	0.000	0.000	-	0.000	0.000	0.794	0.750	0.250	-	0.786	0.900
Lights	130	636	50	0	-	816	45	31	0	0	-	76	0	0	0	0	-	0	0	54	32	1	-	87	979
% Lights	99.2	99.4	100.0	-	-	99.4	100.0	96.9	-	-	-	98.7	-	-	-	-	-	-	-	100.0	97.0	100.0	-	98.9	99.3
Mediums	1	3	0	0	-	4	0	1	0	0	-	1	0	0	0	0	-	0	0	0	1	0	-	1	6
% Mediums	0.8	0.5	0.0	-	-	0.5	0.0	3.1	-	-	-	1.3	-	-	-	-	-	-	-	0.0	3.0	0.0	-	1.1	0.6
Articulated Trucks	0	1	0	0	-	1	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	1
% Articulated Trucks	0.0	0.2	0.0	-	-	0.1	0.0	0.0	-	-	-	0.0	-	-	-	-	-	-	-	0.0	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	23	-	-	-	-	-	11	-	-	-	-	-	7	-	-	-	-	-	9	-	-
% Pedestrians	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-	-	-	-	100.0	-	-

All-Way Stop-Control Warrant

MULTI-WAY STOP SIGN WARRANT ANALYSIS

City/County:	**Dallas/Dallas**	85th-percentile speed on the major street exceeds 40 mph? (Y or N)			**N**
State:	**Texas**			Year	**2018**
Date:	**1/10/2018**				
Major Street:	**Cole Avenue**		Analyzed by:	Kimley-Horn	
Minor Street:	**Armstrong Avenue**		Analyzed by:	Kimley-Horn	

	24-Hour Volume Summary			Major Street Total of Both Approaches	Minor Street Total of Both Approaches	Bicycle Total of All Approaches	Pedestrian Total of All Approaches
12:00 AM	12:00 AM	TO	01:00 AM	-	-		-
1:00 AM	01:00 AM	TO	02:00 AM	-	-		-
2:00 AM	02:00 AM	TO	03:00 AM	-	-		-
3:00 AM	03:00 AM	TO	04:00 AM	-	-		-
4:00 AM	04:00 AM	TO	05:00 AM	-	-		-
5:00 AM	05:00 AM	TO	06:00 AM	-	-		-
6:00 AM	06:00 AM	TO	07:00 AM	105	28		3
7:00 AM	07:00 AM	TO	08:00 AM	339	63		5
8:00 AM	08:00 AM	TO	09:00 AM	529	100		8
9:00 AM	09:00 AM	TO	10:00 AM	339	87		9
10:00 AM	10:00 AM	TO	11:00 AM	295	94		7
11:00 AM	11:00 AM	TO	12:00 PM	414	118		10
12:00 PM	12:00 PM	TO	01:00 PM	501	170		20
1:00 PM	01:00 PM	TO	02:00 PM	472	171		10
2:00 PM	02:00 PM	TO	03:00 PM	647	185		8
3:00 PM	03:00 PM	TO	04:00 PM	494	168		11
4:00 PM	04:00 PM	TO	05:00 PM	648	142		3
5:00 PM	05:00 PM	TO	06:00 PM	821	165		23
6:00 PM	06:00 PM	TO	07:00 PM	622	132		10
7:00 PM	07:00 PM	TO	08:00 PM	400	130		10
8:00 PM	08:00 PM	TO	09:00 PM	284	91		6
9:00 PM	09:00 PM	TO	10:00 PM	216	70		2
10:00 PM	10:00 PM	TO	11:00 PM	95	60		7
11:00 PM	11:00 PM	TO	12:00 AM	50	17		0

Warrant 1	
Major Street	Minor Street
0%	0%
0%	0%
0%	0%
0%	0%
0%	0%
0%	0%
35%	16%
113%	34%
176%	54%
113%	48%
98%	51%
138%	64%
167%	95%
157%	91%
216%	97%
165%	90%
216%	73%
274%	94%
207%	71%
133%	70%
95%	49%
72%	36%
32%	34%
17%	9%

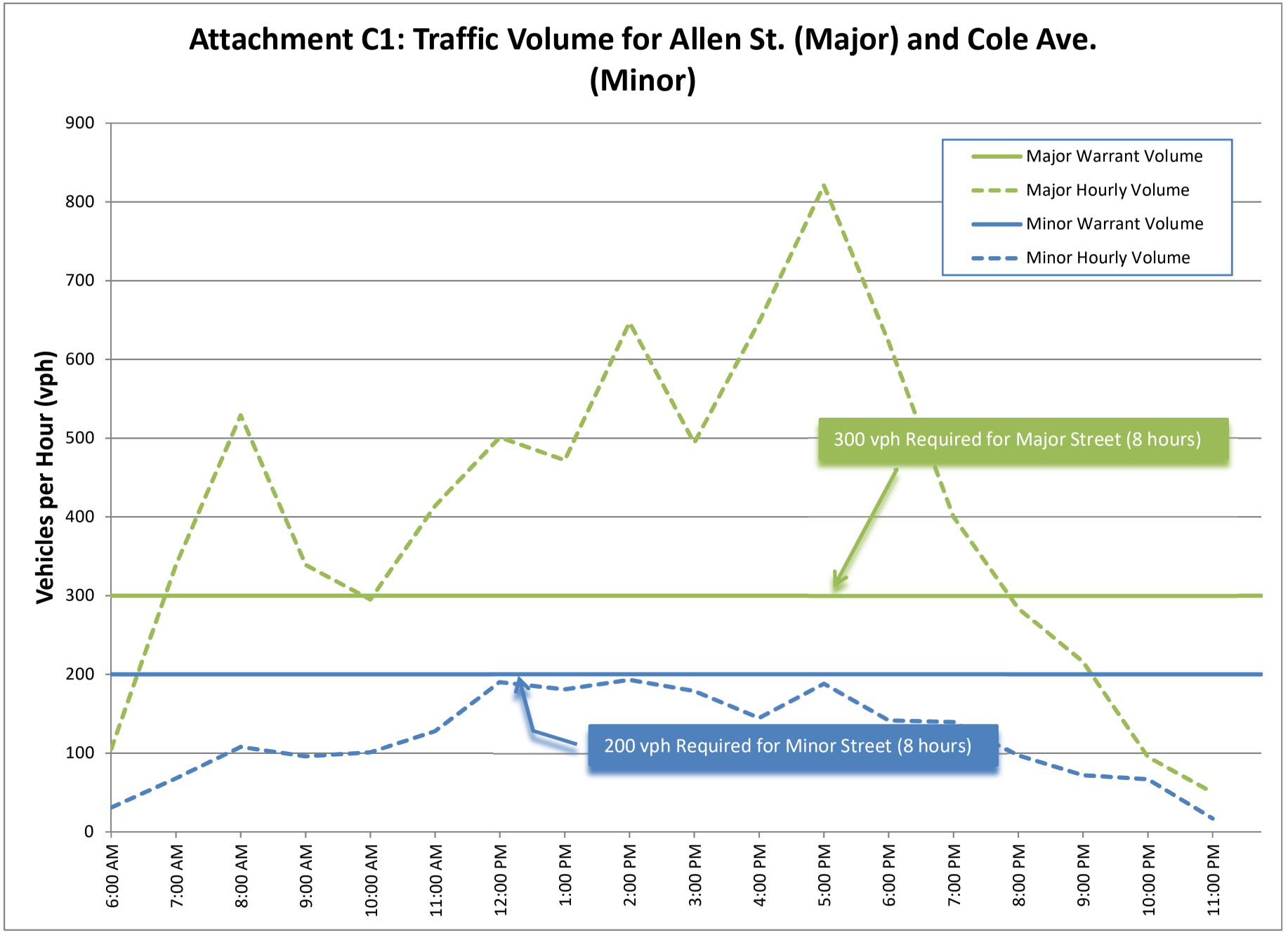
Threshold	
300	200
Summary	
TOTAL	0
Met?	NO

Source: MUTCD, 2011 Edition

Created By: Kimley-Horn and Associates, Inc.

COMMENTS/NOTES:

Attachment C1: Traffic Volume for Allen St. (Major) and Cole Ave. (Minor)



Signal Warrants

TRAFFIC SIGNAL WARRANT ANALYSIS (2011 TXMUTCD)

MAJOR STREET:	Cole Avenue (One-Way)	SB		# OF APPROACH LANES:	3
MINOR STREET:	Armstrong Avenue	EB	WB	# OF APPROACH LANES:	1
CITY, STATE:	Dallas, TX				
COMMENTS:	Existing (2018) Traffic.				

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED OR POSTED SPEED LIMIT GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): N

			Cole Avenue (One-Way)			Armstrong Avenue		
			SB Approach		Total	EB Approach	WB Approach	Minor Street Heavy Leg
06:00 AM	TO	07:00 AM	105		105	10	18	18
07:00 AM	TO	08:00 AM	339		339	37	26	37
08:00 AM	TO	09:00 AM	529		529	57	43	57
09:00 AM	TO	10:00 AM	339		339	41	46	46
10:00 AM	TO	11:00 AM	295		295	47	47	47
11:00 AM	TO	12:00 PM	414		414	63	55	63
12:00 PM	TO	01:00 PM	501		501	64	106	106
01:00 PM	TO	02:00 PM	472		472	61	110	110
02:00 PM	TO	03:00 PM	647		647	66	119	119
03:00 PM	TO	04:00 PM	494		494	78	90	90
04:00 PM	TO	05:00 PM	648		648	70	72	72
05:00 PM	TO	06:00 PM	821		821	88	77	88
06:00 PM	TO	07:00 PM	622		622	59	73	73
07:00 PM	TO	08:00 PM	400		400	51	79	79
08:00 PM	TO	09:00 PM	284		284	38	53	53
09:00 PM	TO	10:00 PM	216		216	33	37	37

Warrant	Description	Warrant Met?
1	Eight-Hour Volume	Warrant NOT Met
2	Four-Hour Volume	Warrant NOT Met
3	Peak Hour Volume	N/A
4	Pedestrian Volume	Warrant NOT Met
5	School Crossing	N/A
6	Coordinated Signal System	N/A
7	Crash Experience	Warrant NOT Met
8	Roadway Network	Warrant NOT Met
9	Intersection Near a Grade Crossing	N/A

01/26/18

Kimley-Horn and Associates, Inc.

TRAFFIC SIGNAL WARRANT ANALYSIS (2011 TXMUTCD)

MAJOR STREET: **Cole Avenue (One-Way)** SB # OF APPROACH LANES: **3**

MINOR STREET: **Armstrong Avenue** EB WB # OF APPROACH LANES: **1**

CITY, STATE: **Dallas, TX**

COMMENTS: Existing (2018) Traffic.

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

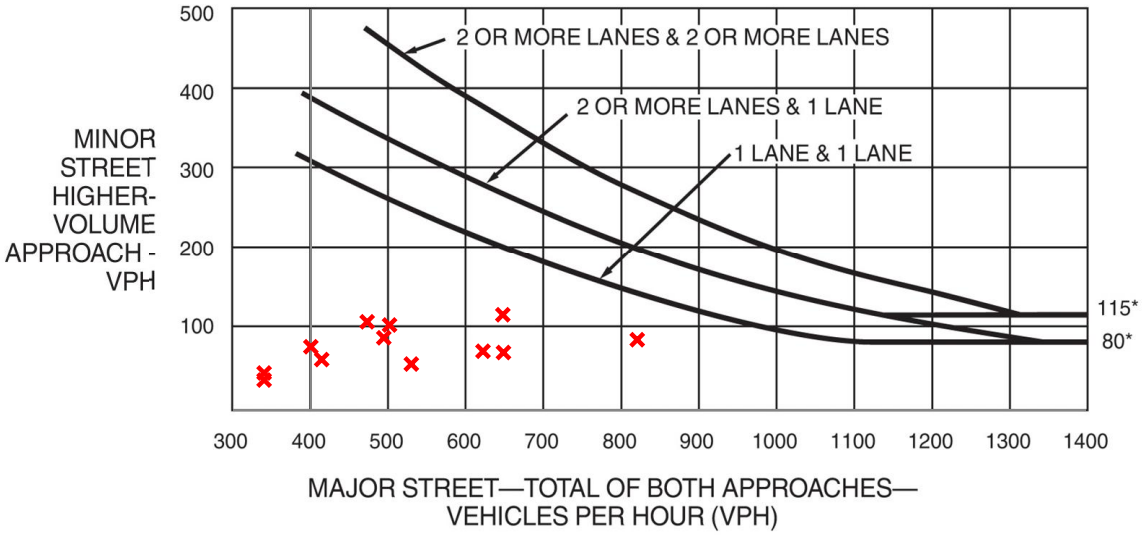
85TH PERCENTILE SPEED OR POSTED SPEED LIMIT GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

			MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour
					MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET		
THRESHOLD VALUES					**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**			
06:00 AM	TO	07:00 AM	105	18														
07:00 AM	TO	08:00 AM	339	37														
08:00 AM	TO	09:00 AM	529	57							Y							
09:00 AM	TO	10:00 AM	339	46														
10:00 AM	TO	11:00 AM	295	47														
11:00 AM	TO	12:00 PM	414	63											Y			
12:00 PM	TO	01:00 PM	501	106					Y		Y				Y			
01:00 PM	TO	02:00 PM	472	110					Y						Y			
02:00 PM	TO	03:00 PM	647	119	Y				Y		Y				Y			
03:00 PM	TO	04:00 PM	494	90					Y		Y				Y			
04:00 PM	TO	05:00 PM	648	72	Y						Y				Y			
05:00 PM	TO	06:00 PM	821	88	Y				Y		Y			Y	Y	**Y**		
06:00 PM	TO	07:00 PM	622	73	Y						Y				Y			
07:00 PM	TO	08:00 PM	400	79					Y						Y			
08:00 PM	TO	09:00 PM	284	53														
09:00 PM	TO	10:00 PM	216	37														
			7,126	1,095	4	0	**0**	0	6	**0**	7	0	**0**	1	9	**1**	**0**	**0**
					8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED
					NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**

01/26/18

Kimley-Horn and Associates, Inc.

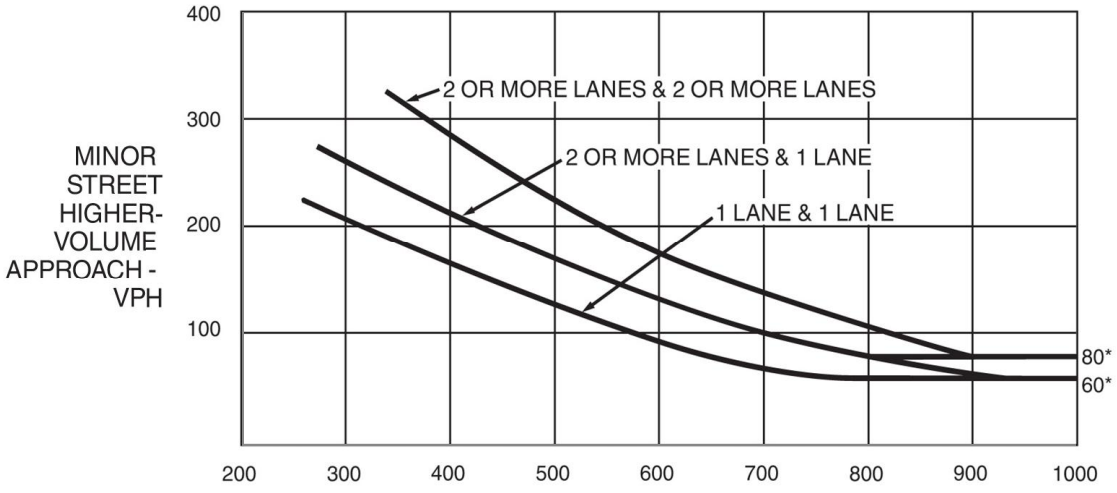
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

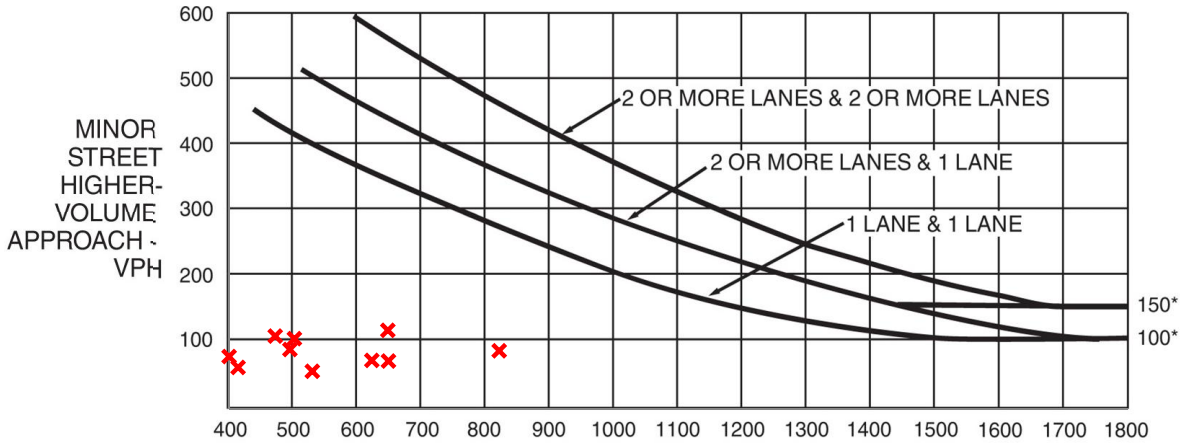
Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

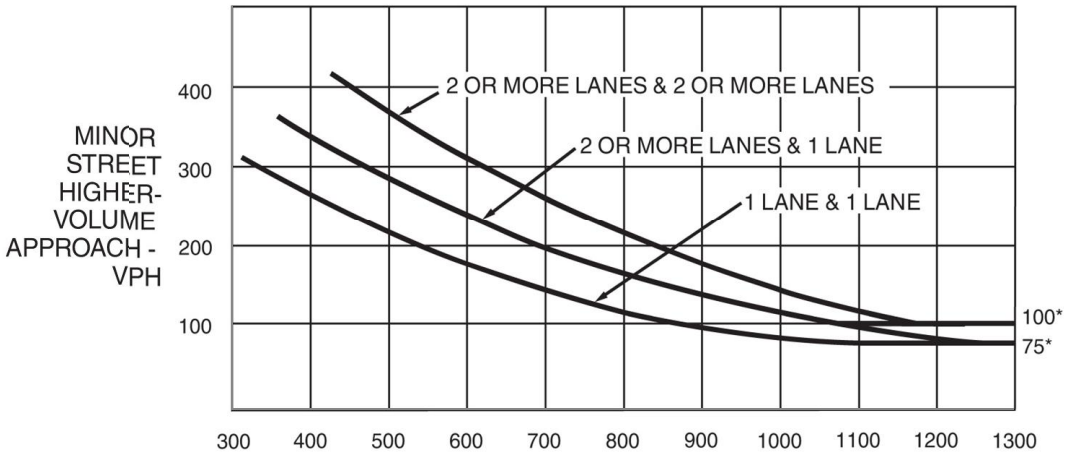
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

TRAFFIC SIGNAL WARRANT ANALYSIS (2011 TXMUTCD)

MAJOR STREET:	Cole Avenue (One-Way)	SB		# OF APPROACH LANES:	3
MINOR STREET:	Armstrong Avenue	EB	WB	# OF APPROACH LANES:	1
CITY, STATE:	Dallas, TX				
COMMENTS:	Existing (2018) + Background Traffic + Knox Street Development (Weir's).				
	Also includes Travis Block Development, McKinney-Cole Block Development, and Buena Vista Development.				

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED OR POSTED SPEED LIMIT GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): N

			Cole Avenue (One-Way)			Armstrong Avenue		
			SB Approach		Total	EB Approach	WB Approach	Minor Street Heavy Leg
06:00 AM	TO	07:00 AM	161		161	48	61	61
07:00 AM	TO	08:00 AM	474		474	93	209	209
08:00 AM	TO	09:00 AM	724		724	149	213	213
09:00 AM	TO	10:00 AM	461		461	131	142	142
10:00 AM	TO	11:00 AM	406		406	152	125	152
11:00 AM	TO	12:00 PM	578		578	232	156	232
12:00 PM	TO	01:00 PM	714		714	278	242	278
01:00 PM	TO	02:00 PM	661		661	246	236	246
02:00 PM	TO	03:00 PM	801		801	231	210	231
03:00 PM	TO	04:00 PM	653		653	270	174	270
04:00 PM	TO	05:00 PM	847		847	332	167	332
05:00 PM	TO	06:00 PM	949		949	277	145	277
06:00 PM	TO	07:00 PM	774		774	222	174	222
07:00 PM	TO	08:00 PM	523		523	186	165	186
08:00 PM	TO	09:00 PM	383		383	158	119	158
09:00 PM	TO	10:00 PM	291		291	137	79	137

Warrant	Description	Warrant Met?
1	Eight-Hour Volume	WARRANT MET
2	Four-Hour Volume	WARRANT MET
3	Peak Hour Volume	N/A
4	Pedestrian Volume	Warrant NOT Met
5	School Crossing	N/A
6	Coordinated Signal System	N/A
7	Crash Experience	Warrant NOT Met
8	Roadway Network	Warrant NOT Met
9	Intersection Near a Grade Crossing	N/A

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Kimley-Horn and Associates, Inc.

TRAFFIC SIGNAL WARRANT ANALYSIS (2011 TXMUTCD)

MAJOR STREET: **Cole Avenue (One-Way)** SB # OF APPROACH LANES: **3**

MINOR STREET: **Armstrong Avenue** EB WB # OF APPROACH LANES: **1**

CITY, STATE: **Dallas, TX**

COMMENTS: Existing (2018) + Background Traffic + Knox Street Development (Weir's).
Also includes Travis Block Development, McKinney-Cole Block Development, and Buena Vista Development.

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

85TH PERCENTILE SPEED OR POSTED SPEED LIMIT GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

			MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour
					MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET		
THRESHOLD VALUES					**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**			
06:00 AM	TO	07:00 AM	161	61											Y			
07:00 AM	TO	08:00 AM	474	209		Y			Y			Y			Y			
08:00 AM	TO	09:00 AM	724	213	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**		
09:00 AM	TO	10:00 AM	461	142					Y			Y			Y			
10:00 AM	TO	11:00 AM	406	152		Y			Y			Y			Y			
11:00 AM	TO	12:00 PM	578	232		Y			Y		Y	Y	**Y**		Y			
12:00 PM	TO	01:00 PM	714	278	Y	Y	**Y**		Y		Y	Y	**Y**		Y		**Y**	
01:00 PM	TO	02:00 PM	661	246	Y	Y	**Y**		Y		Y	Y	**Y**		Y			
02:00 PM	TO	03:00 PM	801	231	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**	**Y**	
03:00 PM	TO	04:00 PM	653	270	Y	Y	**Y**		Y		Y	Y	**Y**		Y		**Y**	
04:00 PM	TO	05:00 PM	847	332	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**	**Y**	
05:00 PM	TO	06:00 PM	949	277	Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	
06:00 PM	TO	07:00 PM	774	222	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**	**Y**	
07:00 PM	TO	08:00 PM	523	186		Y			Y		Y	Y	**Y**		Y			
08:00 PM	TO	09:00 PM	383	158		Y			Y			Y			Y			
09:00 PM	TO	10:00 PM	291	137					Y			Y			Y			
			9,400	3,346	8	13	**8**	1	15	**1**	10	15	**10**	5	16	**5**	**6**	**0**
					8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED
					SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**SATISFIED**	**NOT SATISFIED**

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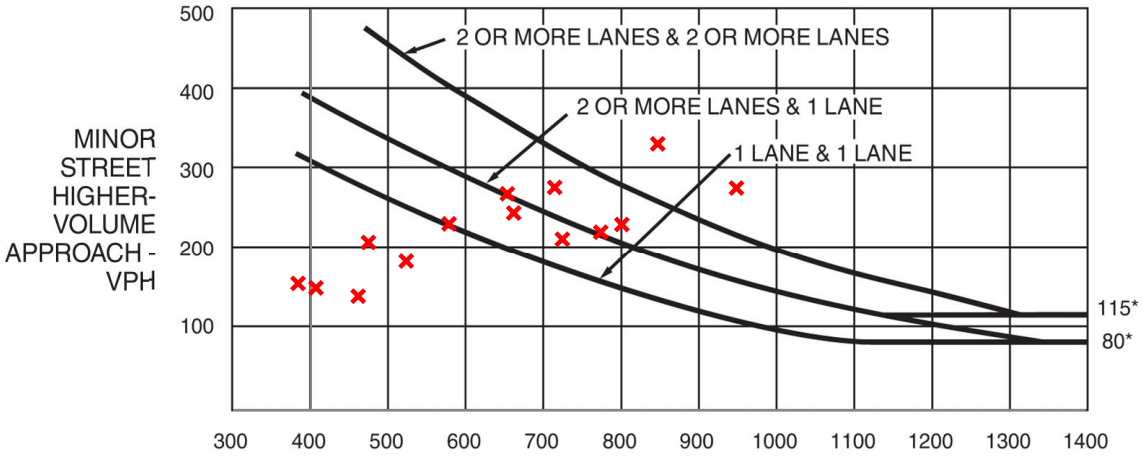
Kimley-Horn and Associates, Inc.

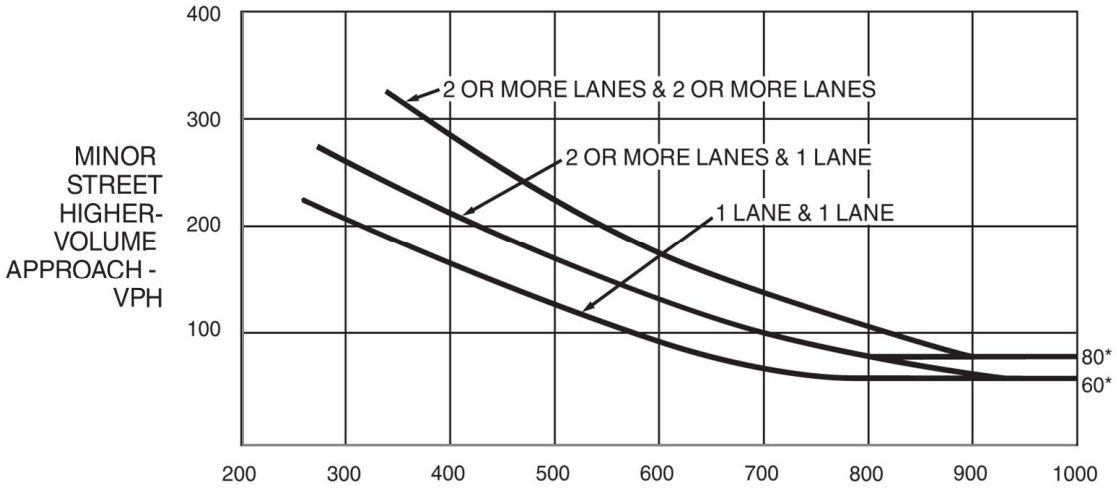
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

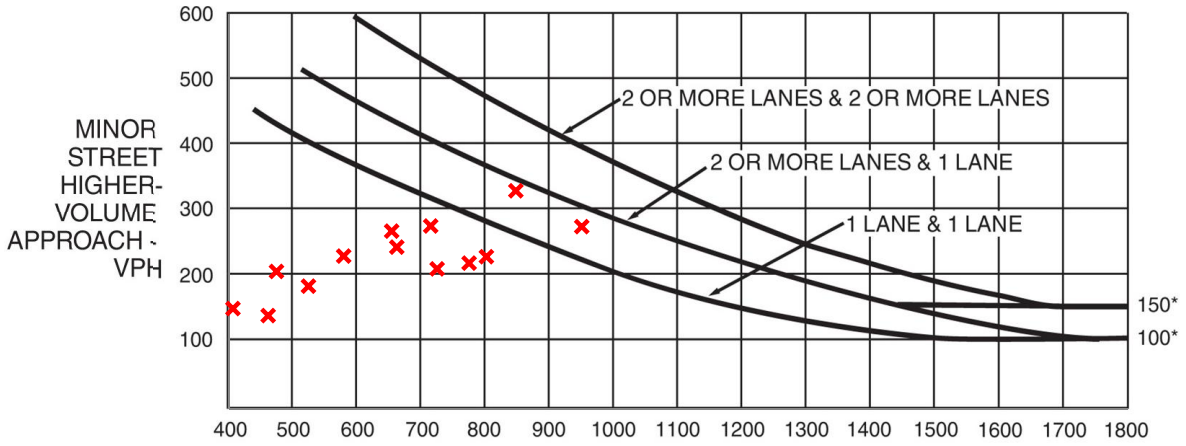
Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

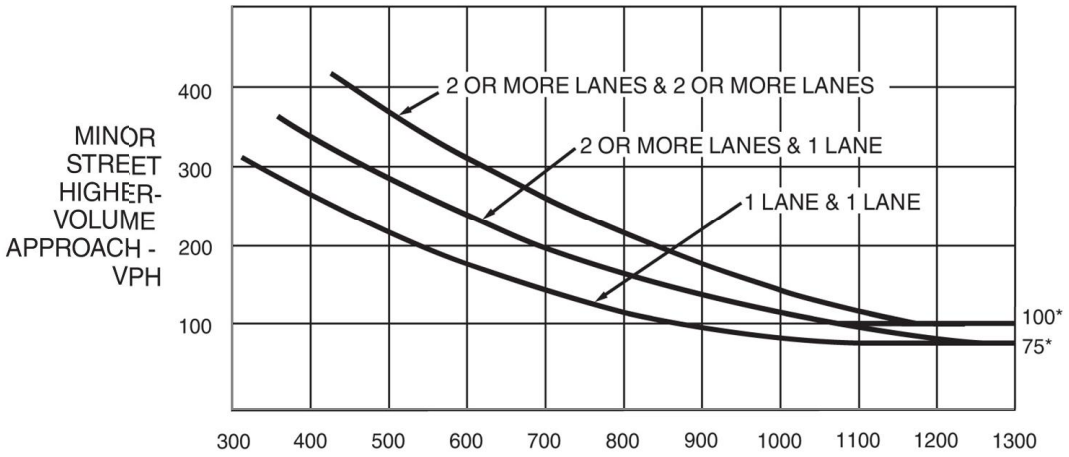
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

TRAFFIC SIGNAL WARRANT ANALYSIS (2011 TXMUTCD)

MAJOR STREET:	Cole Avenue (One-Way)	SB		# OF APPROACH LANES:	3
MINOR STREET:	Armstrong Avenue	EB	WB	# OF APPROACH LANES:	1
CITY, STATE:	Dallas, TX				
COMMENTS:	Existing (2018) + Background Traffic + Alliance Development (Cole at Armstrong) + Knox Street Development (Weir'				
	Also includes Travis Block Development, McKinney-Cole Block Development, and Buena Vista Development.				

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED OR POSTED SPEED LIMIT GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): N

			Cole Avenue (One-Way)			Armstrong Avenue		
			SB Approach		Total	EB Approach	WB Approach	Minor Street Heavy Leg
06:00 AM	TO	07:00 AM	168		168	89	74	89
07:00 AM	TO	08:00 AM	482		482	96	241	241
08:00 AM	TO	09:00 AM	739		739	214	243	243
09:00 AM	TO	10:00 AM	476		476	178	172	178
10:00 AM	TO	11:00 AM	423		423	192	159	192
11:00 AM	TO	12:00 PM	596		596	273	193	273
12:00 PM	TO	01:00 PM	736		736	316	285	316
01:00 PM	TO	02:00 PM	683		683	287	280	287
02:00 PM	TO	03:00 PM	828		828	273	263	273
03:00 PM	TO	04:00 PM	686		686	315	240	315
04:00 PM	TO	05:00 PM	887		887	377	247	377
05:00 PM	TO	06:00 PM	980		980	289	162	289
06:00 PM	TO	07:00 PM	809		809	258	244	258
07:00 PM	TO	08:00 PM	547		547	221	213	221
08:00 PM	TO	09:00 PM	404		404	183	161	183
09:00 PM	TO	10:00 PM	308		308	153	113	153

Warrant	Description	Warrant Met?
1	Eight-Hour Volume	WARRANT MET
2	Four-Hour Volume	WARRANT MET
3	Peak Hour Volume	N/A
4	Pedestrian Volume	Warrant NOT Met
5	School Crossing	N/A
6	Coordinated Signal System	N/A
7	Crash Experience	Warrant NOT Met
8	Roadway Network	Warrant NOT Met
9	Intersection Near a Grade Crossing	N/A

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Kimley-Horn and Associates, Inc.

TRAFFIC SIGNAL WARRANT ANALYSIS (2011 TXMUTCD)

MAJOR STREET: **Cole Avenue (One-Way)** SB # OF APPROACH LANES: **3**

MINOR STREET: **Armstrong Avenue** EB WB # OF APPROACH LANES: **1**

CITY, STATE: **Dallas, TX**

COMMENTS: Existing (2018) + Background Traffic + Alliance Development (Cole at Armstrong) + Knox Street Development (Weir's). Also includes Travis Block Development, McKinney-Cole Block Development, and Buena Vista Development.

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

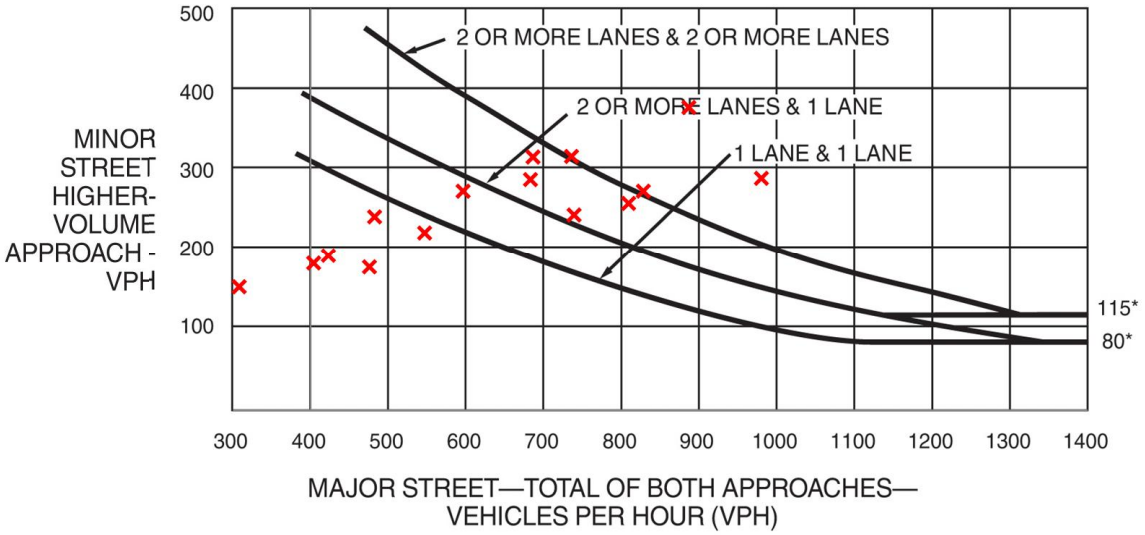
85TH PERCENTILE SPEED OR POSTED SPEED LIMIT GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

			MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour
					MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET		
THRESHOLD VALUES					**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**			
06:00 AM	TO	07:00 AM	168	89					Y						Y			
07:00 AM	TO	08:00 AM	482	241		Y			Y		Y	Y	**Y**		Y			
08:00 AM	TO	09:00 AM	739	243	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**	**Y**	
09:00 AM	TO	10:00 AM	476	178		Y			Y			Y			Y			
10:00 AM	TO	11:00 AM	423	192		Y			Y			Y			Y			
11:00 AM	TO	12:00 PM	596	273		Y			Y		Y	Y	**Y**		Y			
12:00 PM	TO	01:00 PM	736	316	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**	**Y**	
01:00 PM	TO	02:00 PM	683	287	Y	Y	**Y**		Y		Y	Y	**Y**		Y		**Y**	
02:00 PM	TO	03:00 PM	828	273	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**	**Y**	
03:00 PM	TO	04:00 PM	686	315	Y	Y	**Y**		Y		Y	Y	**Y**		Y		**Y**	
04:00 PM	TO	05:00 PM	887	377	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**	**Y**	**Y**
05:00 PM	TO	06:00 PM	980	289	Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	
06:00 PM	TO	07:00 PM	809	258	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**	**Y**	
07:00 PM	TO	08:00 PM	547	221		Y			Y		Y	Y	**Y**		Y			
08:00 PM	TO	09:00 PM	404	183		Y			Y			Y			Y			
09:00 PM	TO	10:00 PM	308	153		Y			Y			Y			Y			
			9,752	3,888	8	15	**8**	1	16	**1**	11	15	**11**	6	16	**6**	**8**	**1**
					8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED
					SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**SATISFIED**	**SATISFIED**

01/26/18

Kimley-Horn and Associates, Inc.

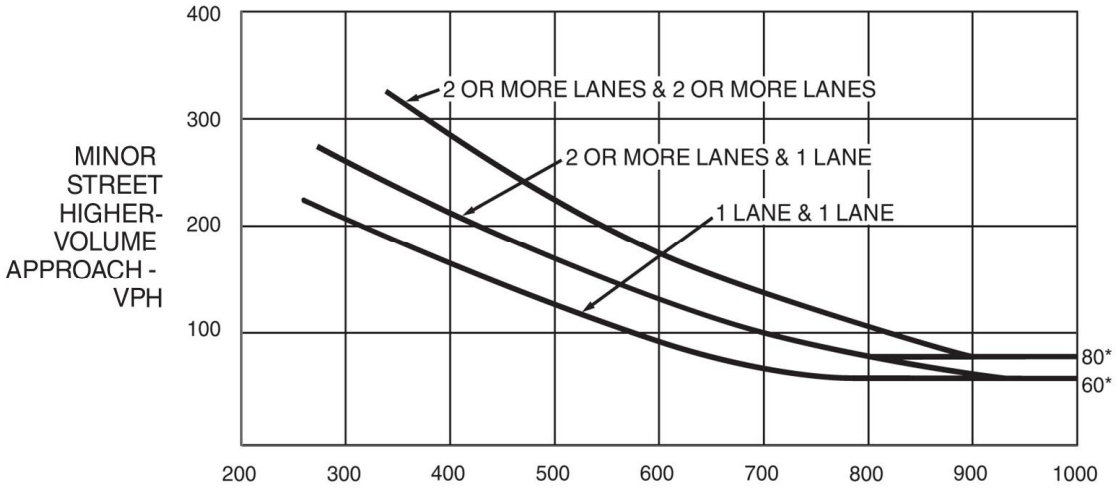
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

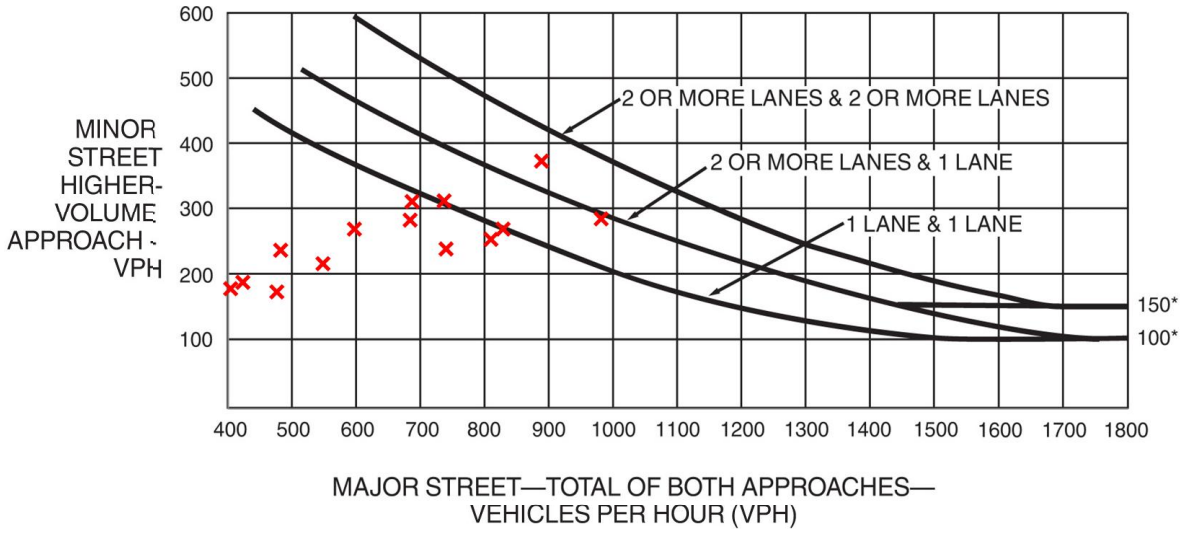
Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

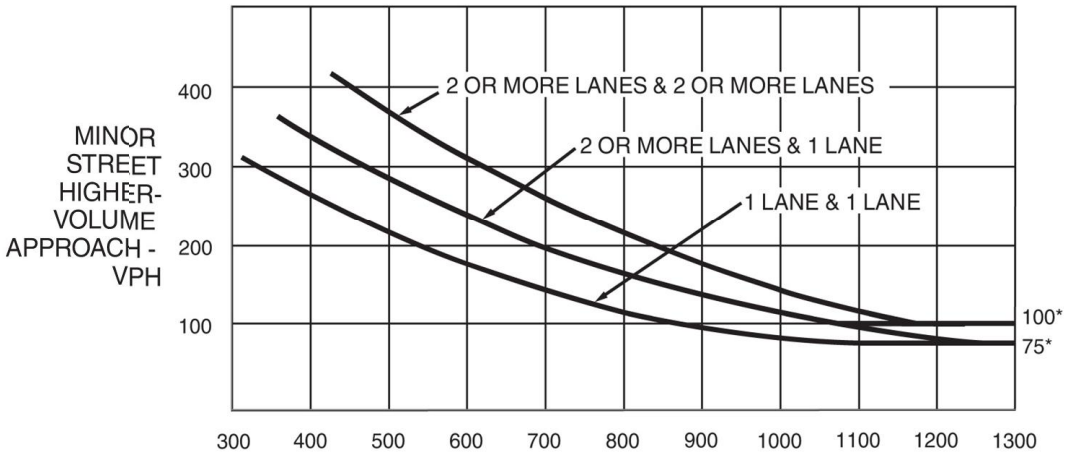
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

TRAFFIC SIGNAL WARRANT ANALYSIS (2011 TXMUTCD)

MAJOR STREET:	Cole Avenue (Two-Way)	SB	NB	# OF APPROACH LANES:	2
MINOR STREET:	Armstrong Avenue	EB	WB	# OF APPROACH LANES:	1
CITY, STATE:	Dallas, TX				
COMMENTS:	Existing (2018) Traffic.				

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED OR POSTED SPEED LIMIT GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): N

			Cole Avenue (Two-Way)			Armstrong Avenue		
			SB Approach	NB Approach	Total	EB Approach	WB Approach	Minor Street Heavy Leg
06:00 AM	TO	07:00 AM	70	35	105	10	18	18
07:00 AM	TO	08:00 AM	226	113	339	37	26	37
08:00 AM	TO	09:00 AM	353	176	529	57	43	57
09:00 AM	TO	10:00 AM	226	113	339	41	46	46
10:00 AM	TO	11:00 AM	197	98	295	47	47	47
11:00 AM	TO	12:00 PM	276	138	414	63	55	63
12:00 PM	TO	01:00 PM	334	167	501	64	106	106
01:00 PM	TO	02:00 PM	315	157	472	61	110	110
02:00 PM	TO	03:00 PM	431	216	647	66	119	119
03:00 PM	TO	04:00 PM	329	165	494	78	90	90
04:00 PM	TO	05:00 PM	432	216	648	70	72	72
05:00 PM	TO	06:00 PM	547	274	821	88	77	88
06:00 PM	TO	07:00 PM	415	207	622	59	73	73
07:00 PM	TO	08:00 PM	267	133	400	51	79	79
08:00 PM	TO	09:00 PM	189	95	284	38	53	53
09:00 PM	TO	10:00 PM	144	72	216	33	37	37

Warrant	Description	Warrant Met?
1	Eight-Hour Volume	Warrant NOT Met
2	Four-Hour Volume	Warrant NOT Met
3	Peak Hour Volume	N/A
4	Pedestrian Volume	Warrant NOT Met
5	School Crossing	N/A
6	Coordinated Signal System	N/A
7	Crash Experience	Warrant NOT Met
8	Roadway Network	Warrant NOT Met
9	Intersection Near a Grade Crossing	N/A

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Kimley-Horn and Associates, Inc.

TRAFFIC SIGNAL WARRANT ANALYSIS (2011 TXMUTCD)

MAJOR STREET: **Cole Avenue (Two-Way)** SB NB # OF APPROACH LANES: **2**

MINOR STREET: **Armstrong Avenue** EB WB # OF APPROACH LANES: **1**

CITY, STATE: **Dallas, TX**

COMMENTS: Existing (2018) Traffic.

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

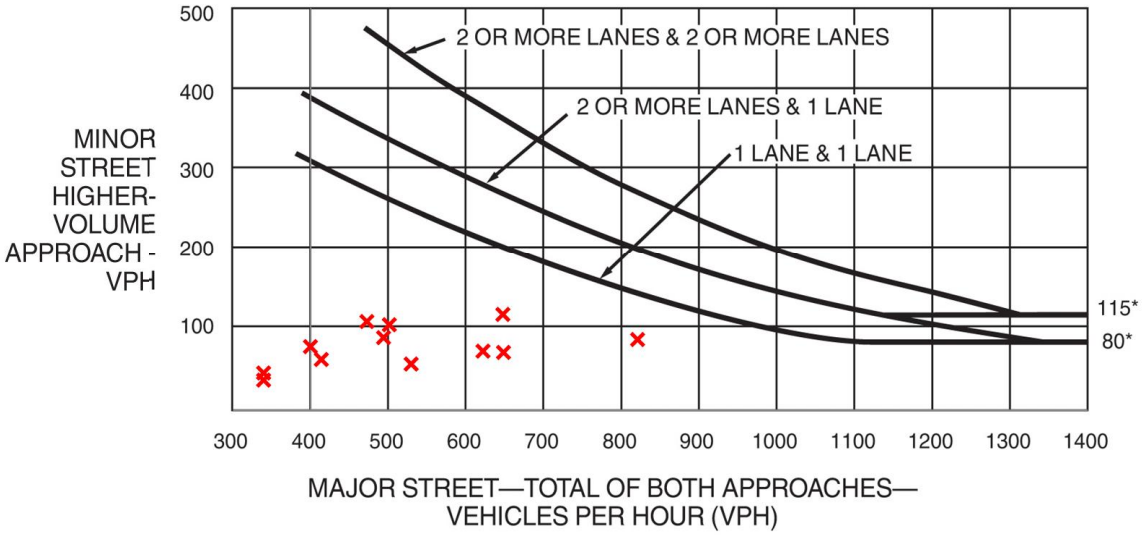
85TH PERCENTILE SPEED OR POSTED SPEED LIMIT GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

			MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour
					MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET		
THRESHOLD VALUES					**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**			
06:00 AM	TO	07:00 AM	105	18														
07:00 AM	TO	08:00 AM	339	37														
08:00 AM	TO	09:00 AM	529	57							Y							
09:00 AM	TO	10:00 AM	339	46														
10:00 AM	TO	11:00 AM	295	47														
11:00 AM	TO	12:00 PM	414	63											Y			
12:00 PM	TO	01:00 PM	501	106					Y		Y				Y			
01:00 PM	TO	02:00 PM	472	110					Y						Y			
02:00 PM	TO	03:00 PM	647	119	Y				Y		Y				Y			
03:00 PM	TO	04:00 PM	494	90					Y		Y				Y			
04:00 PM	TO	05:00 PM	648	72	Y						Y				Y			
05:00 PM	TO	06:00 PM	821	88	Y				Y		Y			Y	Y	**Y**		
06:00 PM	TO	07:00 PM	622	73	Y						Y				Y			
07:00 PM	TO	08:00 PM	400	79					Y						Y			
08:00 PM	TO	09:00 PM	284	53														
09:00 PM	TO	10:00 PM	216	37														
			7,126	1,095	4	0	**0**	0	6	**0**	7	0	**0**	1	9	**1**	**0**	**0**
					8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED
					NOT SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**NOT SATISFIED**	**NOT SATISFIED**

01/26/18

Kimley-Horn and Associates, Inc.

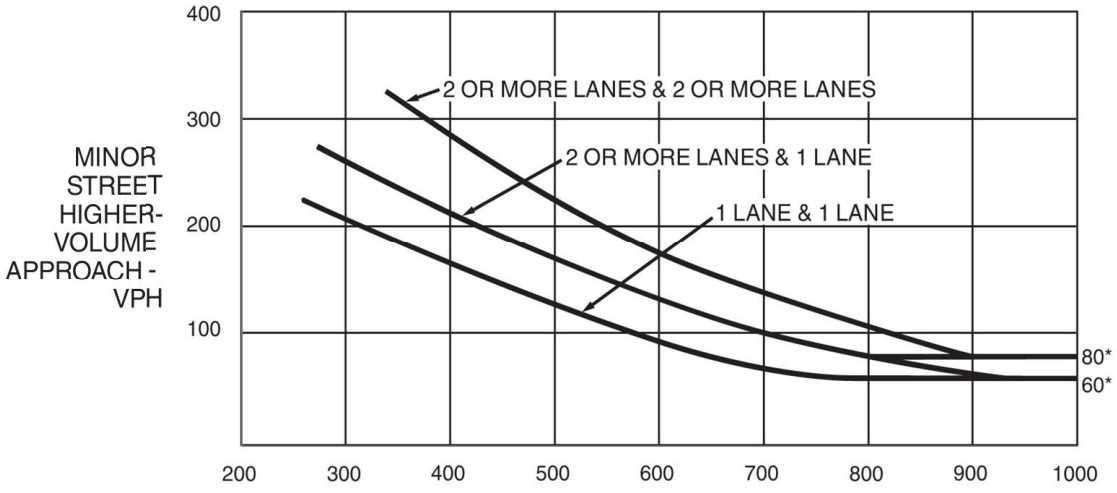
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

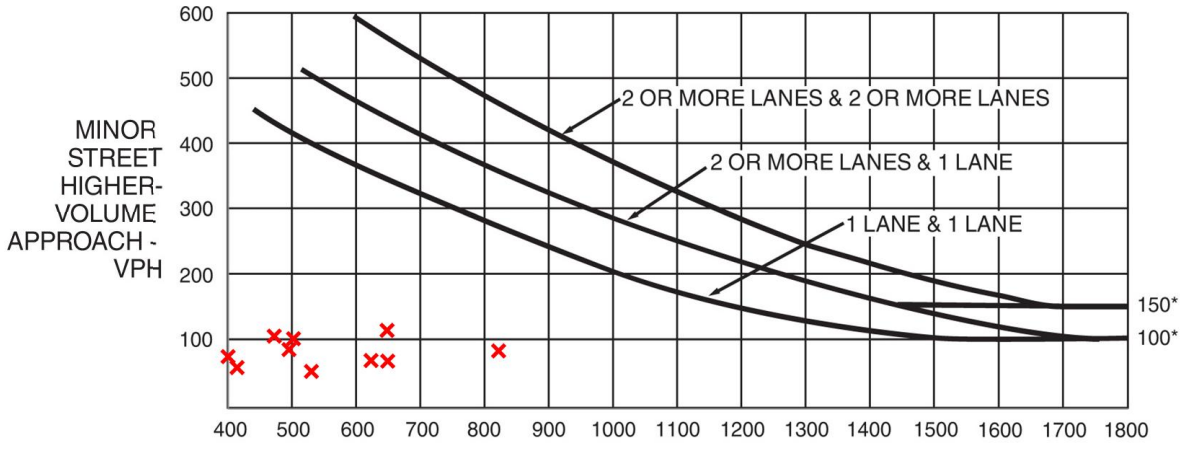
Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

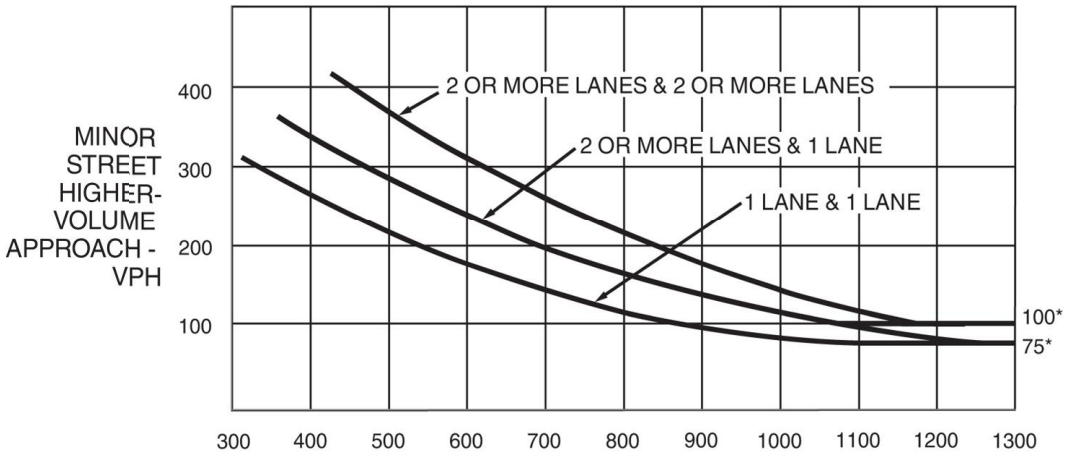
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

TRAFFIC SIGNAL WARRANT ANALYSIS (2011 TXMUTCD)

MAJOR STREET:	Cole Avenue (Two-Way)	SB	NB	# OF APPROACH LANES:	2
MINOR STREET:	Armstrong Avenue	EB	WB	# OF APPROACH LANES:	1
CITY, STATE:	Dallas, TX				
COMMENTS:	Existing (2018) + Background Traffic + Knox Street Development (Weir's).				
	Also includes Travis Block Development, McKinney-Cole Block Development, and Buena Vista Development.				

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED OR POSTED SPEED LIMIT GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): N

			Cole Avenue (Two-Way)			Armstrong Avenue		
			SB Approach	NB Approach	Total	EB Approach	WB Approach	Minor Street Heavy Leg
06:00 AM	TO	07:00 AM	106	53	159	48	54	54
07:00 AM	TO	08:00 AM	323	163	486	93	215	215
08:00 AM	TO	09:00 AM	492	249	741	149	179	179
09:00 AM	TO	10:00 AM	309	152	461	131	130	131
10:00 AM	TO	11:00 AM	267	130	397	152	115	152
11:00 AM	TO	12:00 PM	375	178	553	232	148	232
12:00 PM	TO	01:00 PM	464	219	683	278	227	278
01:00 PM	TO	02:00 PM	434	208	642	246	217	246
02:00 PM	TO	03:00 PM	522	254	776	231	198	231
03:00 PM	TO	04:00 PM	421	201	622	270	163	270
04:00 PM	TO	05:00 PM	541	254	795	332	156	332
05:00 PM	TO	06:00 PM	616	293	909	278	150	278
06:00 PM	TO	07:00 PM	507	244	751	222	168	222
07:00 PM	TO	08:00 PM	343	163	506	186	162	186
08:00 PM	TO	09:00 PM	251	118	369	158	116	158
09:00 PM	TO	10:00 PM	188	85	273	137	76	137

Warrant	Description	Warrant Met?
1	Eight-Hour Volume	WARRANT MET
2	Four-Hour Volume	WARRANT MET
3	Peak Hour Volume	N/A
4	Pedestrian Volume	Warrant NOT Met
5	School Crossing	N/A
6	Coordinated Signal System	N/A
7	Crash Experience	Warrant NOT Met
8	Roadway Network	Warrant NOT Met
9	Intersection Near a Grade Crossing	N/A

01/26/18

Kimley-Horn and Associates, Inc.

TRAFFIC SIGNAL WARRANT ANALYSIS (2011 TXMUTCD)

MAJOR STREET: **Cole Avenue (Two-Way)** SB NB # OF APPROACH LANES: **2**

MINOR STREET: **Armstrong Avenue** EB WB # OF APPROACH LANES: **1**

CITY, STATE: **Dallas, TX**

COMMENTS: Existing (2018) + Background Traffic + Knox Street Development (Weir's).
Also includes Travis Block Development, McKinney-Cole Block Development, and Buena Vista Development.

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): **N**

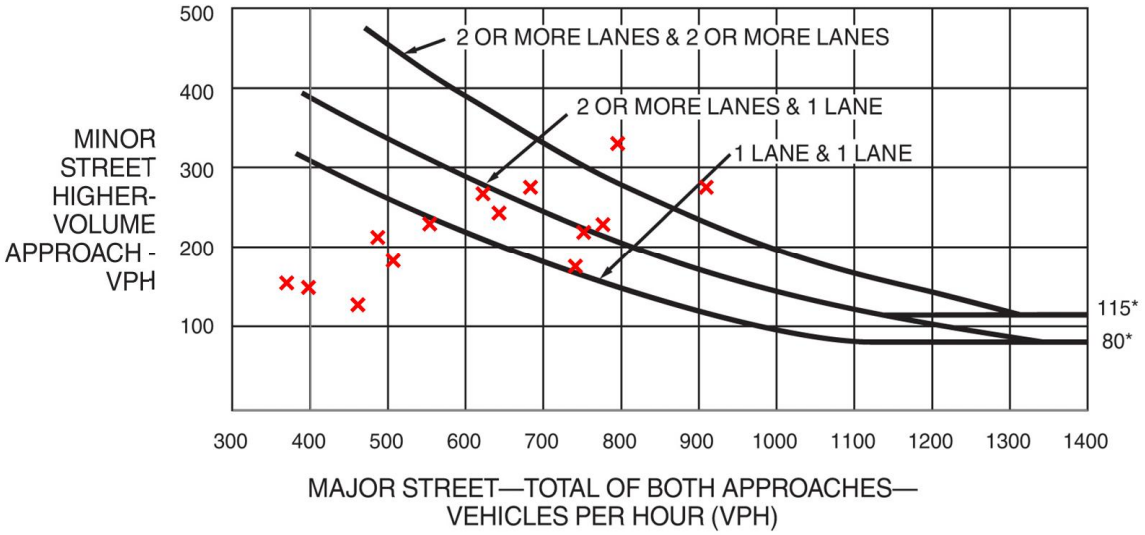
85TH PERCENTILE SPEED OR POSTED SPEED LIMIT GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

			MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour
					MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET		
THRESHOLD VALUES					**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**			
06:00 AM	TO	07:00 AM	159	54														
07:00 AM	TO	08:00 AM	486	215		Y			Y		Y	Y	**Y**		Y			
08:00 AM	TO	09:00 AM	741	179	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**		
09:00 AM	TO	10:00 AM	461	131					Y			Y			Y			
10:00 AM	TO	11:00 AM	397	152		Y			Y			Y			Y			
11:00 AM	TO	12:00 PM	553	232		Y			Y		Y	Y	**Y**		Y			
12:00 PM	TO	01:00 PM	683	278	Y	Y	**Y**		Y		Y	Y	**Y**		Y		**Y**	
01:00 PM	TO	02:00 PM	642	246	Y	Y	**Y**		Y		Y	Y	**Y**		Y			
02:00 PM	TO	03:00 PM	776	231	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**	**Y**	
03:00 PM	TO	04:00 PM	622	270	Y	Y	**Y**		Y		Y	Y	**Y**		Y			
04:00 PM	TO	05:00 PM	795	332	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**	**Y**	
05:00 PM	TO	06:00 PM	909	278	Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	
06:00 PM	TO	07:00 PM	751	222	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**		
07:00 PM	TO	08:00 PM	506	186		Y			Y		Y	Y	**Y**		Y			
08:00 PM	TO	09:00 PM	369	158		Y			Y			Y			Y			
09:00 PM	TO	10:00 PM	273	137					Y			Y			Y			
			9,123	3,301	8	13	**8**	1	15	**1**	11	15	**11**	5	15	**5**	**4**	**0**
					8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED
					SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**SATISFIED**	**NOT SATISFIED**

01/26/18

Kimley-Horn and Associates, Inc.

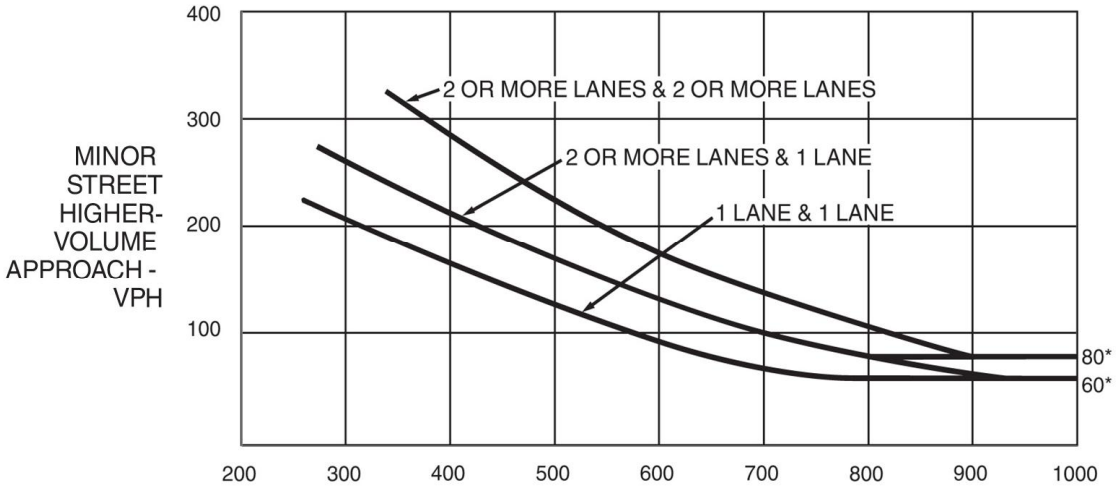
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

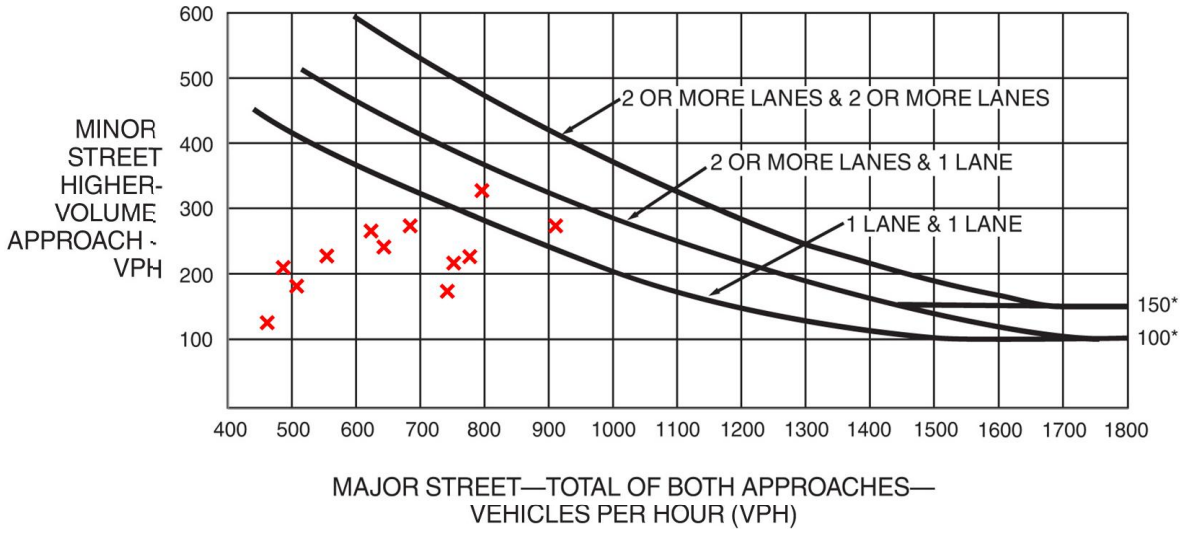
Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

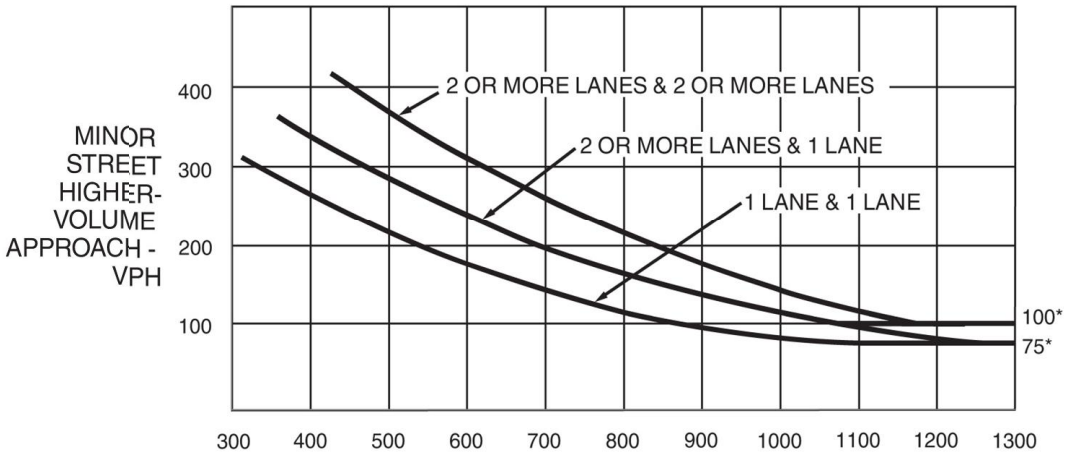
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

TRAFFIC SIGNAL WARRANT ANALYSIS (2011 TXMUTCD)

MAJOR STREET:	Cole Avenue (Two-Way)	SB	NB	# OF APPROACH LANES:	2
MINOR STREET:	Armstrong Avenue	EB	WB	# OF APPROACH LANES:	1
CITY, STATE:	Dallas, TX				
COMMENTS:	Existing (2018) + Background Traffic + Alliance Development (Cole at Armstrong) + Knox Street Development (Weir'				
	Also includes Travis Block Development, McKinney-Cole Block Development, and Buena Vista Development.				

ISOLATED COMMUNITY WITH POPULATION LESS THAN 10,000 (Y OR N): N

85TH PERCENTILE SPEED OR POSTED SPEED LIMIT GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): N

			Cole Avenue (Two-Way)			Armstrong Avenue		
			SB Approach	NB Approach	Total	EB Approach	WB Approach	Minor Street Heavy Leg
06:00 AM	TO	07:00 AM	110	55	165	89	68	89
07:00 AM	TO	08:00 AM	328	169	497	95	253	253
08:00 AM	TO	09:00 AM	502	253	755	214	211	214
09:00 AM	TO	10:00 AM	319	156	475	178	162	178
10:00 AM	TO	11:00 AM	278	134	412	192	150	192
11:00 AM	TO	12:00 PM	387	183	570	273	187	273
12:00 PM	TO	01:00 PM	478	224	702	316	272	316
01:00 PM	TO	02:00 PM	448	214	662	287	264	287
02:00 PM	TO	03:00 PM	539	261	800	273	254	273
03:00 PM	TO	04:00 PM	443	209	652	315	233	315
04:00 PM	TO	05:00 PM	567	264	831	377	240	377
05:00 PM	TO	06:00 PM	635	318	953	284	170	284
06:00 PM	TO	07:00 PM	530	253	783	258	241	258
07:00 PM	TO	08:00 PM	359	169	528	221	213	221
08:00 PM	TO	09:00 PM	265	123	388	183	160	183
09:00 PM	TO	10:00 PM	199	89	288	153	112	153

Warrant	Description	Warrant Met?
1	Eight-Hour Volume	WARRANT MET
2	Four-Hour Volume	WARRANT MET
3	Peak Hour Volume	N/A
4	Pedestrian Volume	Warrant NOT Met
5	School Crossing	N/A
6	Coordinated Signal System	N/A
7	Crash Experience	Warrant NOT Met
8	Roadway Network	Warrant NOT Met
9	Intersection Near a Grade Crossing	N/A

01/26/18

Kimley-Horn and Associates, Inc.

TRAFFIC SIGNAL WARRANT ANALYSIS (2011 TXMUTCD)

MAJOR STREET: **Cole Avenue (Two-Way)** SB NB # OF APPROACH LANES: **2**

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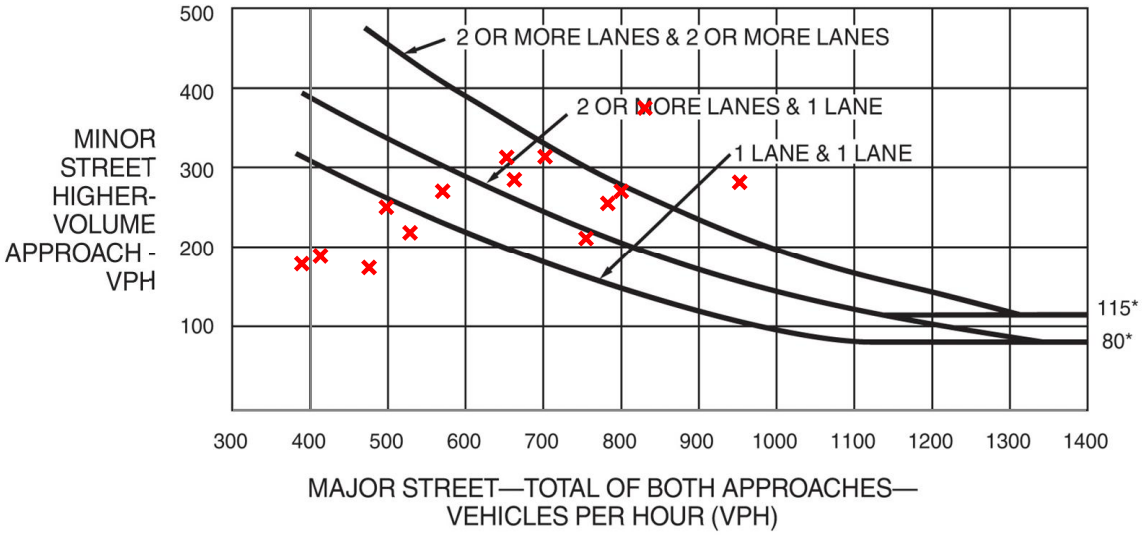
85TH PERCENTILE SPEED OR POSTED SPEED LIMIT GREATER THAN 40 MPH ON MAJOR STREET (Y OR N): **N**

			MAJOR ST TWO-WAY TRAFFIC	MINOR ST TRAFFIC HEAVY LEG	WARRANT 1 - Condition A, Part 1			WARRANT 1 - Condition B, Part 1			WARRANT 1 - Condition A, Part 2			WARRANT 1 - Condition B, Part 2			WARRANT 2 Four-Hour	WARRANT 3 Peak Hour
					MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET	MAIN LINE	SIDE STREET	BOTH MET		
THRESHOLD VALUES					**600**	**150**		**900**	**75**		**480**	**120**		**720**	**60**			
06:00 AM	TO	07:00 AM	165	89					Y						Y			
07:00 AM	TO	08:00 AM	497	253		Y			Y		Y	Y	**Y**		Y			
08:00 AM	TO	09:00 AM	755	214	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**		
09:00 AM	TO	10:00 AM	475	178		Y			Y			Y			Y			
10:00 AM	TO	11:00 AM	412	192		Y			Y			Y			Y			
11:00 AM	TO	12:00 PM	570	273		Y			Y		Y	Y	**Y**		Y			
12:00 PM	TO	01:00 PM	702	316	Y	Y	**Y**		Y		Y	Y	**Y**		Y		**Y**	
01:00 PM	TO	02:00 PM	662	287	Y	Y	**Y**		Y		Y	Y	**Y**		Y		**Y**	
02:00 PM	TO	03:00 PM	800	273	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**	**Y**	
03:00 PM	TO	04:00 PM	652	315	Y	Y	**Y**		Y		Y	Y	**Y**		Y		**Y**	
04:00 PM	TO	05:00 PM	831	377	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**	**Y**	**Y**
05:00 PM	TO	06:00 PM	953	284	Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	Y	Y	**Y**	**Y**	
06:00 PM	TO	07:00 PM	783	258	Y	Y	**Y**		Y		Y	Y	**Y**	Y	Y	**Y**	**Y**	
07:00 PM	TO	08:00 PM	528	221		Y			Y		Y	Y	**Y**		Y			
08:00 PM	TO	09:00 PM	388	183		Y			Y			Y			Y			
09:00 PM	TO	10:00 PM	288	153		Y			Y			Y			Y			
			9,461	3,866	8	15	**8**	1	16	**1**	11	15	**11**	5	16	**5**	**7**	**1**
					8 HOURS NEEDED			8 HOURS NEEDED			8 HOURS NEEDED for both Condition A & B						4 HRS NEEDED	1 HR NEEDED
					SATISFIED			**NOT SATISFIED**			**NOT SATISFIED**						**SATISFIED**	**SATISFIED**

01/26/18

Kimley-Horn and Associates, Inc.

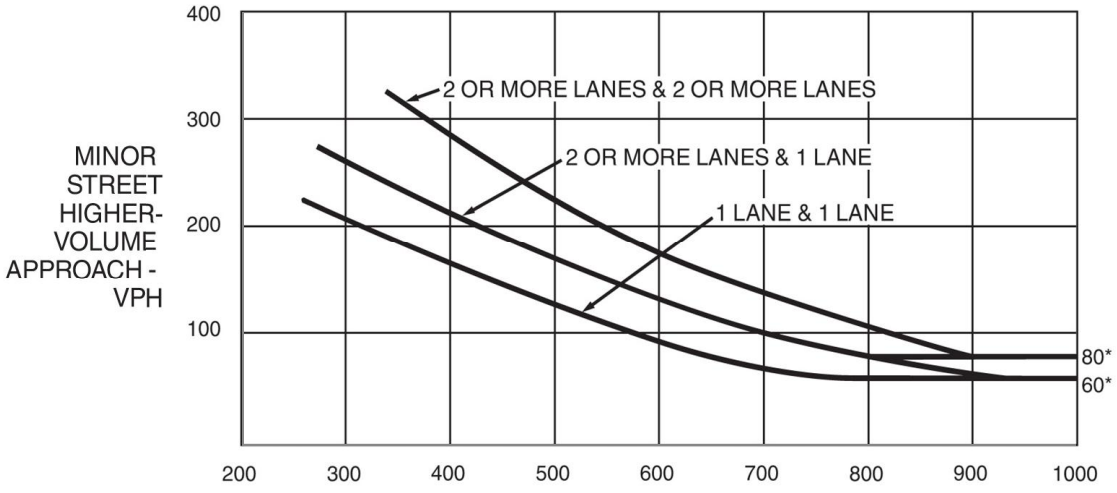
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

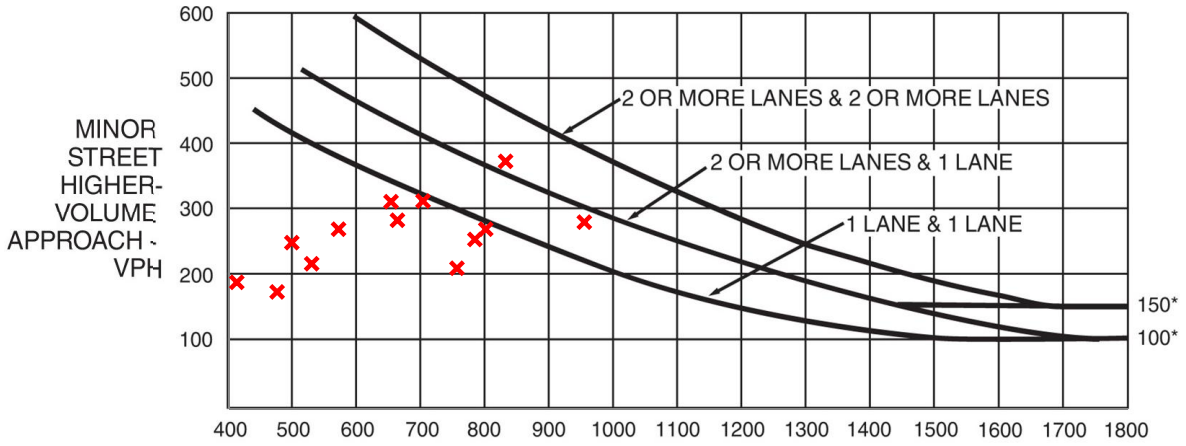
Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

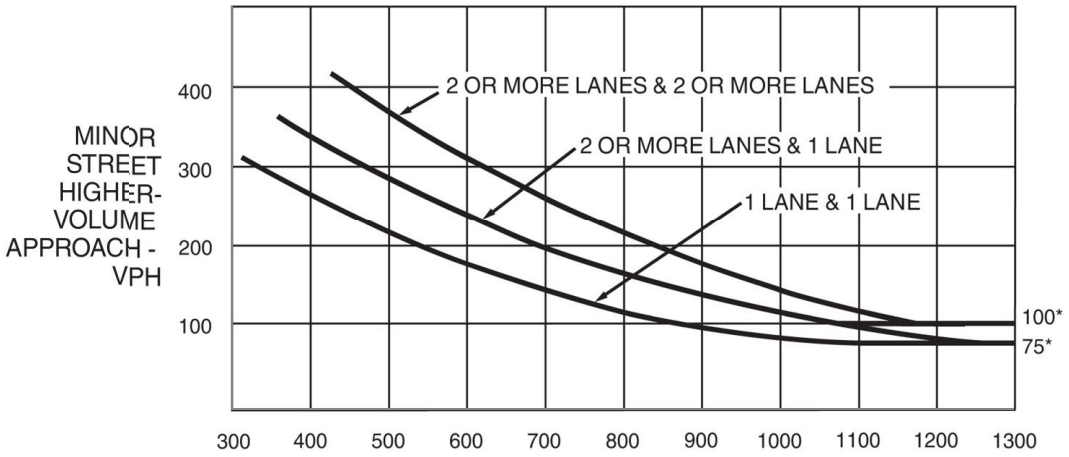
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 40 MPH ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Synchro™ Output - 2018 Background

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	40	13	23	26	0	0	0	0	44	438	16
Future Vol, veh/h	0	40	13	23	26	0	0	0	0	44	438	16
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	43	14	25	28	0	0	0	0	48	476	17

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	596	263	316	605	-			4	0	0
Stage 1	-	592	-	4	4	-			-	-	-
Stage 2	-	4	-	312	601	-			-	-	-
Critical Hdwy	-	6.54	7.14	6.44	6.54	-			5.34	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.74	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.92	3.82	4.02	-			3.12	-	-
Pot Cap-1 Maneuver	0	415	627	630	410	0			1149	-	-
Stage 1	0	492	-	-	-	0			-	-	-
Stage 2	0	-	-	617	488	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	386	621	536	381	-			1149	-	-
Mov Cap-2 Maneuver	-	386	-	536	381	-			-	-	-
Stage 1	-	459	-	-	-	-			-	-	-
Stage 2	-	-	-	514	455	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	14.8	14.3	0.8
HCM LOS	B	B	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	425	441	1149	-	-
HCM Lane V/C Ratio	0.136	0.121	0.042	-	-
HCM Control Delay (s)	14.8	14.3	8.3	0.1	-
HCM Lane LOS	B	B	A	A	-
HCM 95th %tile Q(veh)	0.5	0.4	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	84	0	0	49	0	0
Future Vol, veh/h	84	0	0	49	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	91	0	0	53	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	91	0	144	91
Stage 1	-	-	-	-	91	-
Stage 2	-	-	-	-	53	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1504	-	849	967
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	970	-
Platoon blocked, %	-	-			-	
Mov Cap-1 Maneuver	-	-	1504	-	849	967
Mov Cap-2 Maneuver	-	-	-	-	849	-
Stage 1	-	-	-	-	933	-
Stage 2	-	-	-	-	970	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1504	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	54	33	45	32	0	0	0	0	131	640	50
Future Vol, veh/h	0	54	33	45	32	0	0	0	0	131	640	50
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	59	36	49	35	0	0	0	0	142	696	54

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	1024	391	600	1051	-			4	0	0
Stage 1	-	1020	-	4	4	-			-	-	-
Stage 2	-	4	-	596	1047	-			-	-	-
Critical Hdwy	-	6.54	7.14	6.44	6.54	-			5.34	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.74	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.92	3.82	4.02	-			3.12	-	-
Pot Cap-1 Maneuver	0	234	519	436	225	0			1149	-	-
Stage 1	0	312	-	-	-	0			-	-	-
Stage 2	0	-	-	417	303	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	181	514	255	174	-			1149	-	-
Mov Cap-2 Maneuver	-	181	-	255	174	-			-	-	-
Stage 1	-	243	-	-	-	-			-	-	-
Stage 2	-	-	-	231	236	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	29.4	32.2	1.7
HCM LOS	D	D	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	240	214	1149	-	-
HCM Lane V/C Ratio	0.394	0.391	0.124	-	-
HCM Control Delay (s)	29.4	32.2	8.6	0.4	-
HCM Lane LOS	D	D	A	A	-
HCM 95th %tile Q(veh)	1.8	1.7	0.4	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	185	0	0	77	0	0
Future Vol, veh/h	185	0	0	77	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	201	0	0	84	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	201	0	285	201
Stage 1	-	-	-	-	201	-
Stage 2	-	-	-	-	84	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1371	-	705	840
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	939	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1371	-	705	840
Mov Cap-2 Maneuver	-	-	-	-	705	-
Stage 1	-	-	-	-	833	-
Stage 2	-	-	-	-	939	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1371	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Synchro™ Output - 2020 Background Traffic

Intersection	
Int Delay, s/veh	13.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	75	34	23	209	0	0	0	0	44	462	131
Future Vol, veh/h	0	75	34	23	209	0	0	0	0	44	462	131
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	82	37	25	227	0	0	0	0	48	502	142

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	685	338	345	756	-			4	0	0
Stage 1	-	681	-	4	4	-			-	-	-
Stage 2	-	4	-	341	752	-			-	-	-
Critical Hdwy	-	6.54	7.14	6.44	6.54	-			5.34	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.74	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.92	3.82	4.02	-			3.12	-	-
Pot Cap-1 Maneuver	0	369	562	607	336	0			1149	-	-
Stage 1	0	448	-	-	-	0			-	-	-
Stage 2	0	-	-	593	416	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	340	556	438	309	-			1149	-	-
Mov Cap-2 Maneuver	-	340	-	438	309	-			-	-	-
Stage 1	-	414	-	-	-	-			-	-	-
Stage 2	-	-	-	415	384	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	18.4	48.5	0.6
HCM LOS	C	E	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	387	318	1149	-	-
HCM Lane V/C Ratio	0.306	0.793	0.042	-	-
HCM Control Delay (s)	18.4	48.5	8.3	0.1	-
HCM Lane LOS	C	E	A	A	-
HCM 95th %tile Q(veh)	1.3	6.4	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	120	0	0	232	0	0
Future Vol, veh/h	120	0	0	232	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	130	0	0	252	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	130	0	382	130
Stage 1	-	-	-	-	130	-
Stage 2	-	-	-	-	252	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1455	-	620	920
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	790	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1455	-	620	920
Mov Cap-2 Maneuver	-	-	-	-	620	-
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	790	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1455	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	63.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	177	100	45	100	0	0	0	0	132	716	109
Future Vol, veh/h	0	177	100	45	100	0	0	0	0	132	716	109
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	192	109	49	109	0	0	0	0	143	778	118

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	1140	464	702	1200	-			4	0	0
Stage 1	-	1136	-	4	4	-			-	-	-
Stage 2	-	4	-	698	1196	-			-	-	-
Critical Hdwy	-	6.54	7.14	6.44	6.54	-			5.34	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.74	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.92	3.82	4.02	-			3.12	-	-
Pot Cap-1 Maneuver	0	200	466	381	184	0			1149	-	-
Stage 1	0	275	-	-	-	0			-	-	-
Stage 2	0	-	-	361	258	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	~ 147	461	-	135	-			1149	-	-
Mov Cap-2 Maneuver	-	~ 147	-	-	135	-			-	-	-
Stage 1	-	203	-	-	-	-			-	-	-
Stage 2	-	-	-	~ 11	190	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	$ 312.6		1.6
HCM LOS	F	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	195	-	1149	-	-
HCM Lane V/C Ratio	1.544	-	0.125	-	-
HCM Control Delay (s)	$ 312.6	-	8.6	0.5	-
HCM Lane LOS	F	-	A	A	-
HCM 95th %tile Q(veh)	19.2	-	0.4	-	-

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

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	309	0	0	146	0	0
Future Vol, veh/h	309	0	0	146	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	336	0	0	159	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	336	0	495	336
Stage 1	-	-	-	-	336	-
Stage 2	-	-	-	-	159	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1223	-	534	706
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	870	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1223	-	534	706
Mov Cap-2 Maneuver	-	-	-	-	534	-
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	870	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1223	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

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Synchro™ Output - 2020 Background Plus Site Traffic

Intersection	
Int Delay, s/veh	19.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	78	34	55	209	0	0	0	0	52	462	131
Future Vol, veh/h	0	78	34	55	209	0	0	0	0	52	462	131
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	85	37	60	227	0	0	0	0	57	502	142

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	702	338	364	774	-			4	0	0
Stage 1	-	698	-	4	4	-			-	-	-
Stage 2	-	4	-	360	770	-			-	-	-
Critical Hdwy	-	6.54	7.14	6.44	6.54	-			5.34	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.74	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.92	3.82	4.02	-			3.12	-	-
Pot Cap-1 Maneuver	0	361	562	592	328	0			1149	-	-
Stage 1	0	440	-	-	-	0			-	-	-
Stage 2	0	-	-	578	408	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	328	556	415	298	-			1149	-	-
Mov Cap-2 Maneuver	-	328	-	415	298	-			-	-	-
Stage 1	-	401	-	-	-	-			-	-	-
Stage 2	-	-	-	392	372	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	19.1	66.3	0.8
HCM LOS	C	F	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	375	317	1149	-	-
HCM Lane V/C Ratio	0.325	0.905	0.049	-	-
HCM Control Delay (s)	19.1	66.3	8.3	0.2	-
HCM Lane LOS	C	F	A	A	-
HCM 95th %tile Q(veh)	1.4	8.7	0.2	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	120	11	21	232	32	95
Future Vol, veh/h	120	11	21	232	32	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	130	12	23	252	35	103

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	142	0	434	136
Stage 1	-	-	-	-	136	-
Stage 2	-	-	-	-	298	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1441	-	579	913
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	753	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1441	-	568	913
Mov Cap-2 Maneuver	-	-	-	-	568	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	739	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	792	-	-	1441	-
HCM Lane V/C Ratio	0.174	-	-	0.016	-
HCM Control Delay (s)	10.5	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Int Delay, s/veh	96.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	189	100	62	100	0	0	0	0	163	716	109
Future Vol, veh/h	0	189	100	62	100	0	0	0	0	163	716	109
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	205	109	67	109	0	0	0	0	177	778	118

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	1208	464	776	1267	-			4	0	0
Stage 1	-	1204	-	4	4	-			-	-	-
Stage 2	-	4	-	772	1263	-			-	-	-
Critical Hdwy	-	6.54	7.14	6.44	6.54	-			5.34	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.74	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.92	3.82	4.02	-			3.12	-	-
Pot Cap-1 Maneuver	0	~ 182	466	345	168	0			1149	-	-
Stage 1	0	255	-	-	-	0			-	-	-
Stage 2	0	-	-	325	239	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	~ 123	461	-	114	-			1149	-	-
Mov Cap-2 Maneuver	-	~ 123	-	-	114	-			-	-	-
Stage 1	-	~ 173	-	-	-	-			-	-	-
Stage 2	-	-	-	-	162	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	$ 475.2		1.8
HCM LOS	F	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	165	-	1149	-	-
HCM Lane V/C Ratio	1.904	-	0.154	-	-
HCM Control Delay (s)	$ 475.2	-	8.7	0.5	-
HCM Lane LOS	F	-	A	A	-
HCM 95th %tile Q(veh)	23.6	-	0.5	-	-

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

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	309	44	81	146	17	51
Future Vol, veh/h	309	44	81	146	17	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	-	-	-	-	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	2	2
Mvmt Flow	336	48	88	159	18	55

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	384	0	695	360
Stage 1	-	-	-	-	360	-
Stage 2	-	-	-	-	335	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1174	-	408	684
Stage 1	-	-	-	-	706	-
Stage 2	-	-	-	-	725	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1174	-	375	684
Mov Cap-2 Maneuver	-	-	-	-	375	-
Stage 1	-	-	-	-	706	-
Stage 2	-	-	-	-	666	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	567	-	-	1174	-
HCM Lane V/C Ratio	0.13	-	-	0.075	-
HCM Control Delay (s)	12.3	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.2	-

Synchro™ Output - 2025 Background Traffic

Intersection	
Int Delay, s/veh	15.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	76	34	24	210	0	0	0	0	46	474	132
Future Vol, veh/h	0	76	34	24	210	0	0	0	0	46	474	132
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	83	37	26	228	0	0	0	0	50	515	143

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	703	345	355	775	-			4	0	0
Stage 1	-	699	-	4	4	-			-	-	-
Stage 2	-	4	-	351	771	-			-	-	-
Critical Hdwy	-	6.54	7.14	6.44	6.54	-			5.34	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.74	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.92	3.82	4.02	-			3.12	-	-
Pot Cap-1 Maneuver	0	360	556	599	327	0			1149	-	-
Stage 1	0	440	-	-	-	0			-	-	-
Stage 2	0	-	-	585	408	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	330	550	426	300	-			1149	-	-
Mov Cap-2 Maneuver	-	330	-	426	300	-			-	-	-
Stage 1	-	405	-	-	-	-			-	-	-
Stage 2	-	-	-	404	376	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	18.9	53.7	0.7
HCM LOS	C	F	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	377	309	1149	-	-
HCM Lane V/C Ratio	0.317	0.823	0.044	-	-
HCM Control Delay (s)	18.9	53.7	8.3	0.1	-
HCM Lane LOS	C	F	A	A	-
HCM 95th %tile Q(veh)	1.3	6.9	0.1	-	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	122	0	0	234	0	0
Future Vol, veh/h	122	0	0	234	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	133	0	0	254	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	133	0	387	133
Stage 1	-	-	-	-	133	-
Stage 2	-	-	-	-	254	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1452	-	616	916
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	788	-
Platoon blocked, %	-	-			-	
Mov Cap-1 Maneuver	-	-	1452	-	616	916
Mov Cap-2 Maneuver	-	-	-	-	616	-
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	788	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1452	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	72.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	178	101	47	101	0	0	0	0	136	733	110
Future Vol, veh/h	0	178	101	47	101	0	0	0	0	136	733	110
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	193	110	51	110	0	0	0	0	148	797	120

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	1168	474	719	1228	-			4	0	0
Stage 1	-	1164	-	4	4	-			-	-	-
Stage 2	-	4	-	715	1224	-			-	-	-
Critical Hdwy	-	6.54	7.14	6.44	6.54	-			5.34	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.74	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.92	3.82	4.02	-			3.12	-	-
Pot Cap-1 Maneuver	0	~ 192	459	372	177	0			1149	-	-
Stage 1	0	267	-	-	-	0			-	-	-
Stage 2	0	-	-	353	250	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	~ 138	454	-	127	-			1149	-	-
Mov Cap-2 Maneuver	-	~ 138	-	-	127	-			-	-	-
Stage 1	-	~ 193	-	-	-	-			-	-	-
Stage 2	-	-	-	-	181	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	$ 359.6		1.6
HCM LOS	F	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	184	-	1149	-	-
HCM Lane V/C Ratio	1.648	-	0.129	-	-
HCM Control Delay (s)	$ 359.6	-	8.6	0.5	-
HCM Lane LOS	F	-	A	A	-
HCM 95th %tile Q(veh)	20.5	-	0.4	-	-

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

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	314	0	0	148	0	0
Future Vol, veh/h	314	0	0	148	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	341	0	0	161	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	341	0	502	341
Stage 1	-	-	-	-	341	-
Stage 2	-	-	-	-	161	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1218	-	529	701
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	868	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1218	-	529	701
Mov Cap-2 Maneuver	-	-	-	-	529	-
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	868	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1218	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Synchro™ Output - 2025 Background Plus Site Traffic

Intersection	
Int Delay, s/veh	21.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	79	34	56	210	0	0	0	0	54	474	132
Future Vol, veh/h	0	79	34	56	210	0	0	0	0	54	474	132
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	86	37	61	228	0	0	0	0	59	515	143

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	720	345	374	792	-			4	0	0
Stage 1	-	716	-	4	4	-			-	-	-
Stage 2	-	4	-	370	788	-			-	-	-
Critical Hdwy	-	6.54	7.14	6.44	6.54	-			5.34	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.74	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.92	3.82	4.02	-			3.12	-	-
Pot Cap-1 Maneuver	0	352	556	585	320	0			1149	-	-
Stage 1	0	432	-	-	-	0			-	-	-
Stage 2	0	-	-	570	400	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	318	550	404	290	-			1149	-	-
Mov Cap-2 Maneuver	-	318	-	404	290	-			-	-	-
Stage 1	-	392	-	-	-	-			-	-	-
Stage 2	-	-	-	381	363	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	19.8	74.5	0.8
HCM LOS	C	F	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	364	308	1149	-	-
HCM Lane V/C Ratio	0.337	0.939	0.051	-	-
HCM Control Delay (s)	19.8	74.5	8.3	0.2	-
HCM Lane LOS	C	F	A	A	-
HCM 95th %tile Q(veh)	1.5	9.3	0.2	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	122	11	21	234	32	95
Future Vol, veh/h	122	11	21	234	32	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	133	12	23	254	35	103

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	145	0	439	139
Stage 1	-	-	-	-	139	-
Stage 2	-	-	-	-	300	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1437	-	575	909
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	752	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1437	-	564	909
Mov Cap-2 Maneuver	-	-	-	-	564	-
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	738	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	788	-	-	1437	-
HCM Lane V/C Ratio	0.175	-	-	0.016	-
HCM Control Delay (s)	10.5	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Int Delay, s/veh	108.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	190	101	64	101	0	0	0	0	167	733	110
Future Vol, veh/h	0	190	101	64	101	0	0	0	0	167	733	110
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	207	110	70	110	0	0	0	0	182	797	120

Major/Minor	Minor2			Minor1					Major2		
Conflicting Flow All	-	1236	474	793	1295	-			4	0	0
Stage 1	-	1232	-	4	4	-			-	-	-
Stage 2	-	4	-	789	1291	-			-	-	-
Critical Hdwy	-	6.54	7.14	6.44	6.54	-			5.34	-	-
Critical Hdwy Stg 1	-	5.54	-	-	-	-			-	-	-
Critical Hdwy Stg 2	-	-	-	6.74	5.54	-			-	-	-
Follow-up Hdwy	-	4.02	3.92	3.82	4.02	-			3.12	-	-
Pot Cap-1 Maneuver	0	~ 175	459	337	161	0			1149	-	-
Stage 1	0	248	-	-	-	0			-	-	-
Stage 2	0	-	-	318	232	0			-	-	-
Platoon blocked, %										-	-
Mov Cap-1 Maneuver	-	~ 115	454	-	~ 106	-			1149	-	-
Mov Cap-2 Maneuver	-	~ 115	-	-	~ 106	-			-	-	-
Stage 1	-	~ 164	-	-	-	-			-	-	-
Stage 2	-	-	-	-	153	-			-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	$ 538.3		1.9
HCM LOS	F	-	

Minor Lane/Major Mvmt	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	155	-	1149	-	-
HCM Lane V/C Ratio	2.041	-	0.158	-	-
HCM Control Delay (s)	$ 538.3	-	8.7	0.6	-
HCM Lane LOS	F	-	A	A	-
HCM 95th %tile Q(veh)	24.9	-	0.6	-	-

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

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	314	44	81	148	17	51
Future Vol, veh/h	314	44	81	148	17	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	-	-	-	-	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	2	2
Mvmt Flow	341	48	88	161	18	55

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	389	0	702	365
Stage 1	-	-	-	-	365	-
Stage 2	-	-	-	-	337	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1170	-	404	680
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	723	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1170	-	370	680
Mov Cap-2 Maneuver	-	-	-	-	370	-
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	663	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	562	-	-	1170	-
HCM Lane V/C Ratio	0.132	-	-	0.075	-
HCM Control Delay (s)	12.4	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-

Kimley»Horn

Synchro™ Output - 2020 Background Traffic – Mitigation

HCM 2010 Signalized Intersection Summary

4: Cole & Armstrong

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	75	34	23	209	0	0	0	0	44	462	131
Future Volume (veh/h)	0	75	34	23	209	0	0	0	0	44	462	131
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1900	1863	0				1900	1863	1900
Adj Flow Rate, veh/h	0	82	37	25	227	0				48	502	142
Adj No. of Lanes	0	1	0	0	1	0				0	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				0	2	0
Cap, veh/h	0	240	108	85	339	0				218	2401	689
Arrive On Green	0.00	0.20	0.20	0.20	0.20	0.00				0.21	0.21	0.21
Sat Flow, veh/h	0	1214	548	99	1717	0				342	3775	1083
Grp Volume(v), veh/h	0	0	119	252	0	0				259	216	218
Grp Sat Flow(s),veh/h/ln	0	0	1762	1816	0	0				1846	1695	1660
Q Serve(g_s), s	0.0	0.0	3.5	2.5	0.0	0.0				7.0	6.3	6.5
Cycle Q Clear(g_c), s	0.0	0.0	3.5	7.7	0.0	0.0				7.0	6.3	6.5
Prop In Lane	0.00		0.31	0.10		0.00				0.19		0.65
Lane Grp Cap(c), veh/h	0	0	348	424	0	0				1174	1078	1056
V/C Ratio(X)	0.00	0.00	0.34	0.59	0.00	0.00				0.22	0.20	0.21
Avail Cap(c_a), veh/h	0	0	734	814	0	0				1174	1078	1056
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				0.89	0.89	0.89
Uniform Delay (d), s/veh	0.0	0.0	20.7	22.4	0.0	0.0				11.4	11.1	11.2
Incr Delay (d2), s/veh	0.0	0.0	0.6	1.3	0.0	0.0				0.4	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	1.7	4.0	0.0	0.0				3.7	3.1	3.1
LnGrp Delay(d),s/veh	0.0	0.0	21.3	23.7	0.0	0.0				11.8	11.5	11.6
LnGrp LOS			C	C						B	B	B
Approach Vol, veh/h		119			252						692	
Approach Delay, s/veh		21.3			23.7						11.6	
Approach LOS		C			C						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				16.8		43.2		16.8
Change Period (Y+Rc), s				5.0		5.0		5.0
Max Green Setting (Gmax), s				25.0		25.0		25.0
Max Q Clear Time (g_c+I1), s				5.5		9.0		9.7
Green Ext Time (p_c), s				2.1		3.9		1.9

Intersection Summary	
HCM 2010 Ctrl Delay	15.6
HCM 2010 LOS	B

HCM 2010 TWSC

16: Driveway & Armstrong

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	120	0	0	232	0	0
Future Vol, veh/h	120	0	0	232	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	130	0	0	252	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	130	0	382	130
Stage 1	-	-	-	-	130	-
Stage 2	-	-	-	-	252	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1455	-	620	920
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	790	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1455	-	620	920
Mov Cap-2 Maneuver	-	-	-	-	620	-
Stage 1	-	-	-	-	896	-
Stage 2	-	-	-	-	790	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1455	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

HCM 2010 Signalized Intersection Summary

4: Cole & Armstrong

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	177	100	45	100	0	0	0	0	132	716	109
Future Volume (veh/h)	0	177	100	45	100	0	0	0	0	132	716	109
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1900	1863	0				1900	1863	1900
Adj Flow Rate, veh/h	0	192	109	49	109	0				143	778	118
Adj No. of Lanes	0	1	0	0	1	0				0	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				0	2	0
Cap, veh/h	0	272	154	119	219	0				425	2472	384
Arrive On Green	0.00	0.24	0.24	0.24	0.24	0.00				0.21	0.21	0.21
Sat Flow, veh/h	0	1115	633	167	900	0				683	3970	617
Grp Volume(v), veh/h	0	0	301	158	0	0				383	322	334
Grp Sat Flow(s),veh/h/ln	0	0	1747	1067	0	0				1829	1695	1747
Q Serve(g_s), s	0.0	0.0	9.4	0.7	0.0	0.0				10.7	9.7	9.7
Cycle Q Clear(g_c), s	0.0	0.0	9.4	10.1	0.0	0.0				10.7	9.7	9.7
Prop In Lane	0.00		0.36	0.31		0.00				0.37		0.35
Lane Grp Cap(c), veh/h	0	0	426	339	0	0				1139	1056	1088
V/C Ratio(X)	0.00	0.00	0.71	0.47	0.00	0.00				0.34	0.31	0.31
Avail Cap(c_a), veh/h	0	0	757	626	0	0				1139	1056	1088
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				0.47	0.47	0.47
Uniform Delay (d), s/veh	0.0	0.0	20.7	19.1	0.0	0.0				13.2	12.8	12.9
Incr Delay (d2), s/veh	0.0	0.0	2.2	1.0	0.0	0.0				0.4	0.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	4.8	2.2	0.0	0.0				5.6	4.7	4.8
LnGrp Delay(d),s/veh	0.0	0.0	22.9	20.1	0.0	0.0				13.6	13.2	13.2
LnGrp LOS			C	C						B	B	B
Approach Vol, veh/h		301			158						1039	
Approach Delay, s/veh		22.9			20.1						13.4	
Approach LOS		C			C						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				18.6		41.4		18.6
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				26.0		26.0		26.0
Max Q Clear Time (g_c+I1), s				11.4		12.7		12.1
Green Ext Time (p_c), s				2.5		5.5		2.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

HCM 2010 TWSC

16: Driveway & Armstrong

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	309	0	0	146	0	0
Future Vol, veh/h	309	0	0	146	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	336	0	0	159	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	336	0	495	336
Stage 1	-	-	-	-	336	-
Stage 2	-	-	-	-	159	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1223	-	534	706
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	870	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1223	-	534	706
Mov Cap-2 Maneuver	-	-	-	-	534	-
Stage 1	-	-	-	-	724	-
Stage 2	-	-	-	-	870	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1223	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Synchro™ Output - 2020 Background Plus Site Traffic – Mitigation

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	78	34	55	209	0	0	0	0	52	462	131
Future Volume (veh/h)	0	78	34	55	209	0	0	0	0	52	462	131
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1900	1863	0				1900	1863	1900
Adj Flow Rate, veh/h	0	85	37	60	227	0				57	502	142
Adj No. of Lanes	0	1	0	0	1	0				0	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				0	2	0
Cap, veh/h	0	273	119	130	329	0				245	2279	654
Arrive On Green	0.00	0.22	0.22	0.22	0.22	0.00				0.20	0.20	0.20
Sat Flow, veh/h	0	1230	535	257	1482	0				401	3729	1069
Grp Volume(v), veh/h	0	0	122	287	0	0				262	219	221
Grp Sat Flow(s),veh/h/ln	0	0	1765	1739	0	0				1843	1695	1662
Q Serve(g_s), s	0.0	0.0	3.5	5.4	0.0	0.0				7.1	6.4	6.7
Cycle Q Clear(g_c), s	0.0	0.0	3.5	9.1	0.0	0.0				7.1	6.4	6.7
Prop In Lane	0.00		0.30	0.21		0.00				0.22		0.64
Lane Grp Cap(c), veh/h	0	0	392	459	0	0				1126	1036	1016
V/C Ratio(X)	0.00	0.00	0.31	0.63	0.00	0.00				0.23	0.21	0.22
Avail Cap(c_a), veh/h	0	0	735	788	0	0				1126	1036	1016
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				0.89	0.89	0.89
Uniform Delay (d), s/veh	0.0	0.0	19.5	21.6	0.0	0.0				12.2	11.9	12.0
Incr Delay (d2), s/veh	0.0	0.0	0.4	1.4	0.0	0.0				0.4	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	1.7	4.6	0.0	0.0				3.8	3.1	3.2
LnGrp Delay(d),s/veh	0.0	0.0	19.9	23.0	0.0	0.0				12.6	12.3	12.4
LnGrp LOS			B	C						B	B	B
Approach Vol, veh/h		122			287						701	
Approach Delay, s/veh		19.9			23.0						12.4	
Approach LOS		B			C						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				18.3		41.7		18.3
Change Period (Y+Rc), s				5.0		5.0		5.0
Max Green Setting (Gmax), s				25.0		25.0		25.0
Max Q Clear Time (g_c+I1), s				5.5		9.1		11.1
Green Ext Time (p_c), s				2.4		3.9		2.1

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	120	11	21	232	32	95
Future Vol, veh/h	120	11	21	232	32	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	130	12	23	252	35	103

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	142	0	434	136
Stage 1	-	-	-	-	136	-
Stage 2	-	-	-	-	298	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1441	-	579	913
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	753	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1441	-	568	913
Mov Cap-2 Maneuver	-	-	-	-	568	-
Stage 1	-	-	-	-	890	-
Stage 2	-	-	-	-	739	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	792	-	-	1441	-
HCM Lane V/C Ratio	0.174	-	-	0.016	-
HCM Control Delay (s)	10.5	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	189	100	62	100	0	0	0	0	163	716	109
Future Volume (veh/h)	0	189	100	62	100	0	0	0	0	163	716	109
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1900	1863	0				1900	1863	1900
Adj Flow Rate, veh/h	0	205	109	67	109	0				177	778	118
Adj No. of Lanes	0	1	0	0	1	0				0	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				0	2	0
Cap, veh/h	0	316	168	148	205	0				483	2275	353
Arrive On Green	0.00	0.28	0.28	0.28	0.28	0.00				0.19	0.19	0.19
Sat Flow, veh/h	0	1144	608	235	742	0				818	3851	598
Grp Volume(v), veh/h	0	0	314	176	0	0				394	333	346
Grp Sat Flow(s),veh/h/ln	0	0	1752	977	0	0				1822	1695	1750
Q Serve(g_s), s	0.0	0.0	9.5	2.7	0.0	0.0				11.3	10.2	10.2
Cycle Q Clear(g_c), s	0.0	0.0	9.5	12.1	0.0	0.0				11.3	10.2	10.2
Prop In Lane	0.00		0.35	0.38		0.00				0.45		0.34
Lane Grp Cap(c), veh/h	0	0	484	353	0	0				1076	1001	1034
V/C Ratio(X)	0.00	0.00	0.65	0.50	0.00	0.00				0.37	0.33	0.33
Avail Cap(c_a), veh/h	0	0	759	580	0	0				1076	1001	1034
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				0.47	0.47	0.47
Uniform Delay (d), s/veh	0.0	0.0	19.2	19.3	0.0	0.0				14.4	14.0	14.0
Incr Delay (d2), s/veh	0.0	0.0	1.5	1.1	0.0	0.0				0.5	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	4.7	2.8	0.0	0.0				5.8	4.9	5.1
LnGrp Delay(d),s/veh	0.0	0.0	20.6	20.4	0.0	0.0				14.9	14.4	14.4
LnGrp LOS			C	C						B	B	B
Approach Vol, veh/h		314			176						1073	
Approach Delay, s/veh		20.6			20.4						14.6	
Approach LOS		C			C						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				20.6		39.4		20.6
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				26.0		26.0		26.0
Max Q Clear Time (g_c+I1), s				11.5		13.3		14.1
Green Ext Time (p_c), s				2.7		5.5		2.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	309	44	81	146	17	51
Future Vol, veh/h	309	44	81	146	17	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	-	-	-	-	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	2	2
Mvmt Flow	336	48	88	159	18	55

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	384	0	695	360
Stage 1	-	-	-	-	360	-
Stage 2	-	-	-	-	335	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1174	-	408	684
Stage 1	-	-	-	-	706	-
Stage 2	-	-	-	-	725	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1174	-	375	684
Mov Cap-2 Maneuver	-	-	-	-	375	-
Stage 1	-	-	-	-	706	-
Stage 2	-	-	-	-	666	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3	12.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	567	-	-	1174	-
HCM Lane V/C Ratio	0.13	-	-	0.075	-
HCM Control Delay (s)	12.3	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.2	-

Synchro™ Output - 2025 Background Traffic – Mitigation

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	76	34	24	210	0	0	0	0	46	474	132
Future Volume (veh/h)	0	76	34	24	210	0	0	0	0	46	474	132
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1900	1863	0				1900	1863	1900
Adj Flow Rate, veh/h	0	83	37	26	228	0				50	515	143
Adj No. of Lanes	0	1	0	0	1	0				0	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				0	2	0
Cap, veh/h	0	242	108	87	340	0				221	2404	677
Arrive On Green	0.00	0.20	0.20	0.20	0.20	0.00				0.21	0.21	0.21
Sat Flow, veh/h	0	1219	544	103	1711	0				349	3787	1067
Grp Volume(v), veh/h	0	0	120	254	0	0				265	221	223
Grp Sat Flow(s),veh/h/ln	0	0	1763	1814	0	0				1845	1695	1662
Q Serve(g_s), s	0.0	0.0	3.5	2.6	0.0	0.0				7.1	6.5	6.6
Cycle Q Clear(g_c), s	0.0	0.0	3.5	7.7	0.0	0.0				7.1	6.5	6.6
Prop In Lane	0.00		0.31	0.10		0.00				0.19		0.64
Lane Grp Cap(c), veh/h	0	0	350	426	0	0				1171	1076	1055
V/C Ratio(X)	0.00	0.00	0.34	0.60	0.00	0.00				0.23	0.21	0.21
Avail Cap(c_a), veh/h	0	0	735	814	0	0				1171	1076	1055
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				0.89	0.89	0.89
Uniform Delay (d), s/veh	0.0	0.0	20.7	22.3	0.0	0.0				11.5	11.2	11.3
Incr Delay (d2), s/veh	0.0	0.0	0.6	1.3	0.0	0.0				0.4	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	1.8	4.0	0.0	0.0				3.8	3.2	3.2
LnGrp Delay(d),s/veh	0.0	0.0	21.3	23.7	0.0	0.0				11.9	11.6	11.7
LnGrp LOS			C	C						B	B	B
Approach Vol, veh/h		120			254						708	
Approach Delay, s/veh		21.3			23.7						11.7	
Approach LOS		C			C						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				16.9		43.1		16.9
Change Period (Y+Rc), s				5.0		5.0		5.0
Max Green Setting (Gmax), s				25.0		25.0		25.0
Max Q Clear Time (g_c+I1), s				5.5		9.1		9.7
Green Ext Time (p_c), s				2.1		4.0		1.9

Intersection Summary	
HCM 2010 Ctrl Delay	15.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	122	0	0	234	0	0
Future Vol, veh/h	122	0	0	234	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	133	0	0	254	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	133	0	387	133
Stage 1	-	-	-	-	133	-
Stage 2	-	-	-	-	254	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1452	-	616	916
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	788	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1452	-	616	916
Mov Cap-2 Maneuver	-	-	-	-	616	-
Stage 1	-	-	-	-	893	-
Stage 2	-	-	-	-	788	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1452	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

HCM 2010 Signalized Intersection Summary

4: Cole & Armstrong

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	178	101	47	101	0	0	0	0	136	733	110
Future Volume (veh/h)	0	178	101	47	101	0	0	0	0	136	733	110
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1900	1863	0				1900	1863	1900
Adj Flow Rate, veh/h	0	193	110	51	110	0				148	797	120
Adj No. of Lanes	0	1	0	0	1	0				0	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				0	2	0
Cap, veh/h	0	276	157	122	219	0				427	2455	379
Arrive On Green	0.00	0.25	0.25	0.25	0.25	0.00				0.20	0.20	0.20
Sat Flow, veh/h	0	1113	634	174	883	0				690	3968	613
Grp Volume(v), veh/h	0	0	303	161	0	0				392	330	342
Grp Sat Flow(s),veh/h/ln	0	0	1747	1057	0	0				1828	1695	1748
Q Serve(g_s), s	0.0	0.0	9.5	0.9	0.0	0.0				11.0	10.0	10.0
Cycle Q Clear(g_c), s	0.0	0.0	9.5	10.4	0.0	0.0				11.0	10.0	10.0
Prop In Lane	0.00		0.36	0.32		0.00				0.38		0.35
Lane Grp Cap(c), veh/h	0	0	433	341	0	0				1131	1049	1081
V/C Ratio(X)	0.00	0.00	0.70	0.47	0.00	0.00				0.35	0.32	0.32
Avail Cap(c_a), veh/h	0	0	757	621	0	0				1131	1049	1081
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				0.47	0.47	0.47
Uniform Delay (d), s/veh	0.0	0.0	20.5	19.1	0.0	0.0				13.5	13.1	13.1
Incr Delay (d2), s/veh	0.0	0.0	2.1	1.0	0.0	0.0				0.4	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	4.8	2.6	0.0	0.0				5.7	4.8	4.9
LnGrp Delay(d),s/veh	0.0	0.0	22.6	20.1	0.0	0.0				13.9	13.4	13.4
LnGrp LOS			C	C						B	B	B
Approach Vol, veh/h		303			161						1065	
Approach Delay, s/veh		22.6			20.1						13.6	
Approach LOS		C			C						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				18.9		41.1		18.9
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				26.0		26.0		26.0
Max Q Clear Time (g_c+I1), s				11.5		13.0		12.4
Green Ext Time (p_c), s				2.5		5.5		2.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.1
HCM 2010 LOS	B

HCM 2010 TWSC

16: Driveway & Armstrong

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	314	0	0	148	0	0
Future Vol, veh/h	314	0	0	148	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	341	0	0	161	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	341	0	502	341
Stage 1	-	-	-	-	341	-
Stage 2	-	-	-	-	161	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1218	-	529	701
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	868	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1218	-	529	701
Mov Cap-2 Maneuver	-	-	-	-	529	-
Stage 1	-	-	-	-	720	-
Stage 2	-	-	-	-	868	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1218	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Synchro™ Output - 2025 Background Plus Site Traffic – Mitigation

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	79	34	56	210	0	0	0	0	54	474	132
Future Volume (veh/h)	0	79	34	56	210	0	0	0	0	54	474	132
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1900	1863	0				1900	1863	1900
Adj Flow Rate, veh/h	0	86	37	61	228	0				59	515	143
Adj No. of Lanes	0	1	0	0	1	0				0	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				0	2	0
Cap, veh/h	0	276	119	131	330	0				248	2282	643
Arrive On Green	0.00	0.22	0.22	0.22	0.22	0.00				0.20	0.20	0.20
Sat Flow, veh/h	0	1235	531	261	1477	0				406	3741	1054
Grp Volume(v), veh/h	0	0	123	289	0	0				268	224	226
Grp Sat Flow(s),veh/h/ln	0	0	1766	1738	0	0				1842	1695	1664
Q Serve(g_s), s	0.0	0.0	3.5	5.5	0.0	0.0				7.3	6.6	6.8
Cycle Q Clear(g_c), s	0.0	0.0	3.5	9.2	0.0	0.0				7.3	6.6	6.8
Prop In Lane	0.00		0.30	0.21		0.00				0.22		0.63
Lane Grp Cap(c), veh/h	0	0	395	461	0	0				1124	1034	1015
V/C Ratio(X)	0.00	0.00	0.31	0.63	0.00	0.00				0.24	0.22	0.22
Avail Cap(c_a), veh/h	0	0	736	788	0	0				1124	1034	1015
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				0.89	0.89	0.89
Uniform Delay (d), s/veh	0.0	0.0	19.4	21.5	0.0	0.0				12.3	12.0	12.1
Incr Delay (d2), s/veh	0.0	0.0	0.4	1.4	0.0	0.0				0.4	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	1.8	4.6	0.0	0.0				3.9	3.2	3.3
LnGrp Delay(d),s/veh	0.0	0.0	19.9	23.0	0.0	0.0				12.7	12.4	12.5
LnGrp LOS			B	C						B	B	B
Approach Vol, veh/h		123			289						717	
Approach Delay, s/veh		19.9			23.0						12.6	
Approach LOS		B			C						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				18.4		41.6		18.4
Change Period (Y+Rc), s				5.0		5.0		5.0
Max Green Setting (Gmax), s				25.0		25.0		25.0
Max Q Clear Time (g_c+I1), s				5.5		9.3		11.2
Green Ext Time (p_c), s				2.4		4.0		2.1

Intersection Summary	
HCM 2010 Ctrl Delay	16.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	122	11	21	234	32	95
Future Vol, veh/h	122	11	21	234	32	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	133	12	23	254	35	103

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	145	0	439	139
Stage 1	-	-	-	-	139	-
Stage 2	-	-	-	-	300	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1437	-	575	909
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	752	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1437	-	564	909
Mov Cap-2 Maneuver	-	-	-	-	564	-
Stage 1	-	-	-	-	888	-
Stage 2	-	-	-	-	738	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	10.5
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	788	-	-	1437	-
HCM Lane V/C Ratio	0.175	-	-	0.016	-
HCM Control Delay (s)	10.5	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	190	101	64	101	0	0	0	0	167	733	110
Future Volume (veh/h)	0	190	101	64	101	0	0	0	0	167	733	110
Number	7	4	14	3	8	18				1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00				1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1900	1863	0				1900	1863	1900
Adj Flow Rate, veh/h	0	207	110	70	110	0				182	797	120
Adj No. of Lanes	0	1	0	0	1	0				0	3	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92				0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	0				0	2	0
Cap, veh/h	0	322	171	152	204	0				480	2254	347
Arrive On Green	0.00	0.28	0.28	0.28	0.28	0.00				0.19	0.19	0.19
Sat Flow, veh/h	0	1144	608	244	724	0				821	3853	594
Grp Volume(v), veh/h	0	0	317	180	0	0				404	341	354
Grp Sat Flow(s),veh/h/ln	0	0	1752	968	0	0				1822	1695	1751
Q Serve(g_s), s	0.0	0.0	9.5	3.0	0.0	0.0				11.6	10.4	10.5
Cycle Q Clear(g_c), s	0.0	0.0	9.5	12.5	0.0	0.0				11.6	10.4	10.5
Prop In Lane	0.00		0.35	0.39		0.00				0.45		0.34
Lane Grp Cap(c), veh/h	0	0	494	356	0	0				1066	992	1024
V/C Ratio(X)	0.00	0.00	0.64	0.51	0.00	0.00				0.38	0.34	0.35
Avail Cap(c_a), veh/h	0	0	759	574	0	0				1066	992	1024
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				0.33	0.33	0.33
Upstream Filter(I)	0.00	0.00	1.00	1.00	0.00	0.00				0.47	0.47	0.47
Uniform Delay (d), s/veh	0.0	0.0	18.9	19.3	0.0	0.0				14.7	14.3	14.3
Incr Delay (d2), s/veh	0.0	0.0	1.4	1.1	0.0	0.0				0.5	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	4.8	2.9	0.0	0.0				6.0	5.0	5.2
LnGrp Delay(d),s/veh	0.0	0.0	20.3	20.4	0.0	0.0				15.2	14.7	14.7
LnGrp LOS			C	C						B	B	B
Approach Vol, veh/h		317			180						1099	
Approach Delay, s/veh		20.3			20.4						14.9	
Approach LOS		C			C						B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				20.9		39.1		20.9
Change Period (Y+Rc), s				4.0		4.0		4.0
Max Green Setting (Gmax), s				26.0		26.0		26.0
Max Q Clear Time (g_c+I1), s				11.5		13.6		14.5
Green Ext Time (p_c), s				2.7		5.6		2.4

Intersection Summary	
HCM 2010 Ctrl Delay	16.6
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	314	44	81	148	17	51
Future Vol, veh/h	314	44	81	148	17	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	-	-	-	-	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	2	2
Mvmt Flow	341	48	88	161	18	55

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	389	0	702	365
Stage 1	-	-	-	-	365	-
Stage 2	-	-	-	-	337	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1170	-	404	680
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	723	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1170	-	370	680
Mov Cap-2 Maneuver	-	-	-	-	370	-
Stage 1	-	-	-	-	702	-
Stage 2	-	-	-	-	663	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	562	-	-	1170	-
HCM Lane V/C Ratio	0.132	-	-	0.075	-
HCM Control Delay (s)	12.4	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-

Synchro™ Output - 2020 Background Traffic with McKinney-Cole Two-Way Conversion

Intersection	
Int Delay, s/veh	34.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	61	24	15	266	6	48	190	6	29	302	101
Future Vol, veh/h	24	61	24	15	266	6	48	190	6	29	302	101
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	66	26	16	289	7	52	207	7	32	328	110

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	926	779	399	814	831	220	450	0	0	217	0	0
Stage 1	458	458	-	318	318	-	-	-	-	-	-	-
Stage 2	468	321	-	496	513	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	249	327	651	297	305	820	1110	-	-	1353	-	-
Stage 1	583	567	-	693	654	-	-	-	-	-	-	-
Stage 2	575	652	-	556	536	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	300	642	223	~ 280	813	1106	-	-	1346	-	-
Mov Cap-2 Maneuver	-	300	-	223	~ 280	-	-	-	-	-	-	-
Stage 1	550	548	-	658	621	-	-	-	-	-	-	-
Stage 2	289	619	-	456	518	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		127.8	1.7	0.5
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1106	-	-	-	280	1346	-	-
HCM Lane V/C Ratio	0.047	-	-	-	1.114	0.023	-	-
HCM Control Delay (s)	8.4	-	-	-	127.8	7.7	-	-
HCM Lane LOS	A	-	-	-	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	13	0.1	-	-

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

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	91	0	0	281	0	0
Future Vol, veh/h	91	0	0	281	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	99	0	0	305	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	99	0	404	99
Stage 1	-	-	-	-	99	-
Stage 2	-	-	-	-	305	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1494	-	603	957
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1494	-	603	957
Mov Cap-2 Maneuver	-	-	-	-	603	-
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	748	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1494	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	113.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	122	71	30	98	22	26	223	13	88	458	75
Future Vol, veh/h	85	122	71	30	98	22	26	223	13	88	458	75
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	92	133	77	33	107	24	28	242	14	96	498	82

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1119	1059	555	1149	1093	259	591	0	0	261	0	0
Stage 1	742	742	-	310	310	-	-	-	-	-	-	-
Stage 2	377	317	-	839	783	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	184	224	531	176	214	780	985	-	-	1303	-	-
Stage 1	408	422	-	700	659	-	-	-	-	-	-	-
Stage 2	644	654	-	360	404	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 91	199	524	65	190	774	982	-	-	1296	-	-
Mov Cap-2 Maneuver	~ 91	199	-	65	190	-	-	-	-	-	-	-
Stage 1	392	387	-	678	638	-	-	-	-	-	-	-
Stage 2	503	633	-	186	370	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 444	161.5	0.9	1.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	982	-	-	165	149	1296	-	-
HCM Lane V/C Ratio	0.029	-	-	1.831	1.094	0.074	-	-
HCM Control Delay (s)	8.8	-	-	$ 444	161.5	8	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	22.2	8.7	0.2	-	-

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

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	210	0	0	129	0	0
Future Vol, veh/h	210	0	0	129	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	228	0	0	140	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	228	0	368	228
Stage 1	-	-	-	-	228	-
Stage 2	-	-	-	-	140	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1340	-	632	811
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	887	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1340	-	632	811
Mov Cap-2 Maneuver	-	-	-	-	632	-
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	887	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1340	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Synchro™ Output - 2020 Background Plus Site Traffic with McKinney-Cole Two-Way Conversion

Intersection	
Int Delay, s/veh	55.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	63	24	40	266	19	48	190	12	34	302	101
Future Vol, veh/h	24	63	24	40	266	19	48	190	12	34	302	101
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	68	26	43	289	21	52	207	13	37	328	110

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	947	797	399	829	845	223	450	0	0	224	0	0
Stage 1	469	469	-	321	321	-	-	-	-	-	-	-
Stage 2	478	328	-	508	524	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	241	319	651	290	300	817	1110	-	-	1345	-	-
Stage 1	575	561	-	691	652	-	-	-	-	-	-	-
Stage 2	568	647	-	547	530	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	292	642	214	~ 274	810	1106	-	-	1338	-	-
Mov Cap-2 Maneuver	-	292	-	214	~ 274	-	-	-	-	-	-	-
Stage 1	542	540	-	656	619	-	-	-	-	-	-	-
Stage 2	280	615	-	444	510	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		190.1	1.6	0.6
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1106	-	-	-	275	1338	-	-
HCM Lane V/C Ratio	0.047	-	-	-	1.285	0.028	-	-
HCM Control Delay (s)	8.4	-	-	-	190.1	7.8	-	-
HCM Lane LOS	A	-	-	-	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-	17.4	0.1	-	-

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

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	91	13	19	281	38	89
Future Vol, veh/h	91	13	19	281	38	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	99	14	21	305	41	97

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	113	0	453	106
Stage 1	-	-	-	-	106	-
Stage 2	-	-	-	-	347	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1476	-	565	948
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	716	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1476	-	555	948
Mov Cap-2 Maneuver	-	-	-	-	555	-
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	704	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	782	-	-	1476	-
HCM Lane V/C Ratio	0.177	-	-	0.014	-
HCM Control Delay (s)	10.6	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Int Delay, s/veh	176

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	128	71	43	98	29	26	223	38	107	458	75
Future Vol, veh/h	85	128	71	43	98	29	26	223	38	107	458	75
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	92	139	77	47	107	32	28	242	41	116	498	82

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1178	1127	555	1207	1148	273	591	0	0	288	0	0
Stage 1	783	783	-	324	324	-	-	-	-	-	-	-
Stage 2	395	344	-	883	824	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	168	205	531	160	199	766	985	-	-	1274	-	-
Stage 1	387	404	-	688	650	-	-	-	-	-	-	-
Stage 2	630	637	-	340	387	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 74	179	524	~ 45	173	760	982	-	-	1268	-	-
Mov Cap-2 Maneuver	~ 74	179	-	~ 45	173	-	-	-	-	-	-	-
Stage 1	372	363	-	666	629	-	-	-	-	-	-	-
Stage 2	485	617	-	162	348	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 602	$ 417.3	0.8	1.4
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	982	-	-	142	109	1268	-	-
HCM Lane V/C Ratio	0.029	-	-	2.174	1.695	0.092	-	-
HCM Control Delay (s)	8.8	-	-	$ 602	$ 417.3	8.1	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	25.4	14.3	0.3	-	-

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

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	210	50	75	129	20	47
Future Vol, veh/h	210	50	75	129	20	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	228	54	82	140	22	51

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	283	0	558	255
Stage 1	-	-	-	-	255	-
Stage 2	-	-	-	-	303	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1279	-	491	784
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	749	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1279	-	457	784
Mov Cap-2 Maneuver	-	-	-	-	457	-
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	697	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	646	-	-	1279	-
HCM Lane V/C Ratio	0.113	-	-	0.064	-
HCM Control Delay (s)	11.3	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.2	-

Synchro™ Output - 2025 Background Traffic with McKinney-Cole Two-Way Conversion

Intersection	
Int Delay, s/veh	38.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↱		↰	↱	
Traffic Vol, veh/h	24	62	24	16	268	6	49	194	6	30	309	101
Future Vol, veh/h	24	62	24	16	268	6	49	194	6	30	309	101
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	67	26	17	291	7	53	211	7	33	336	110

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	944	796	407	832	848	224	458	0	0	221	0	0
Stage 1	468	468	-	325	325	-	-	-	-	-	-	-
Stage 2	476	328	-	507	523	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	242	320	644	288	298	815	1103	-	-	1348	-	-
Stage 1	575	561	-	687	649	-	-	-	-	-	-	-
Stage 2	570	647	-	548	530	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	293	635	214	~ 273	808	1099	-	-	1341	-	-
Mov Cap-2 Maneuver	-	293	-	214	~ 273	-	-	-	-	-	-	-
Stage 1	542	542	-	652	616	-	-	-	-	-	-	-
Stage 2	282	614	-	447	512	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		142.8	1.7	0.5
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1099	-	-	-	273	1341	-	-
HCM Lane V/C Ratio	0.048	-	-	-	1.155	0.024	-	-
HCM Control Delay (s)	8.4	-	-	-	142.8	7.8	-	-
HCM Lane LOS	A	-	-	-	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-	13.8	0.1	-	-

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

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰	
Traffic Vol, veh/h	92	0	0	283	0	0
Future Vol, veh/h	92	0	0	283	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	100	0	0	308	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	100	0	408	100
Stage 1	-	-	-	-	100	-
Stage 2	-	-	-	-	308	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1493	-	599	956
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	745	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1493	-	599	956
Mov Cap-2 Maneuver	-	-	-	-	599	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	745	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1493	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	127.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	86	122	72	31	99	23	26	229	13	90	469	76
Future Vol, veh/h	86	122	72	31	99	23	26	229	13	90	469	76
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	93	133	78	34	108	25	28	249	14	98	510	83

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1144	1083	567	1173	1117	266	604	0	0	267	0	0
Stage 1	759	759	-	317	317	-	-	-	-	-	-	-
Stage 2	385	324	-	856	800	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	177	217	523	169	207	773	974	-	-	1297	-	-
Stage 1	399	415	-	694	654	-	-	-	-	-	-	-
Stage 2	638	650	-	352	397	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 84	192	516	59	183	767	971	-	-	1291	-	-
Mov Cap-2 Maneuver	~ 84	192	-	59	183	-	-	-	-	-	-	-
Stage 1	384	380	-	672	633	-	-	-	-	-	-	-
Stage 2	495	629	-	179	363	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 499	197.6	0.9	1.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	971	-	-	156	140	1291	-	-
HCM Lane V/C Ratio	0.029	-	-	1.951	1.188	0.076	-	-
HCM Control Delay (s)	8.8	-	-	$ 499	197.6	8	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	23.4	9.7	0.2	-	-

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

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	212	0	0	130	0	0
Future Vol, veh/h	212	0	0	130	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	230	0	0	141	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	230	0	371	230
Stage 1	-	-	-	-	230	-
Stage 2	-	-	-	-	141	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1338	-	630	809
Stage 1	-	-	-	-	808	-
Stage 2	-	-	-	-	886	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1338	-	630	809
Mov Cap-2 Maneuver	-	-	-	-	630	-
Stage 1	-	-	-	-	808	-
Stage 2	-	-	-	-	886	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1338	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Synchro™ Output - 2025 Background Plus Site Traffic with McKinney-Cole Two-Way Conversion

Intersection	
Int Delay, s/veh	61.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	64	24	41	268	19	49	194	12	35	309	101
Future Vol, veh/h	24	64	24	41	268	19	49	194	12	35	309	101
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	70	26	45	291	21	53	211	13	38	336	110

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	965	813	407	847	862	227	458	0	0	228	0	0
Stage 1	479	479	-	328	328	-	-	-	-	-	-	-
Stage 2	486	334	-	519	534	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	234	313	644	282	293	812	1103	-	-	1340	-	-
Stage 1	568	555	-	685	647	-	-	-	-	-	-	-
Stage 2	563	643	-	540	524	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	286	635	206	~ 267	805	1099	-	-	1333	-	-
Mov Cap-2 Maneuver	-	286	-	206	~ 267	-	-	-	-	-	-	-
Stage 1	535	534	-	650	614	-	-	-	-	-	-	-
Stage 2	273	610	-	436	504	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		211.4	1.6	0.6
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1099	-	-	-	267	1333	-	-
HCM Lane V/C Ratio	0.048	-	-	-	1.335	0.029	-	-
HCM Control Delay (s)	8.4	-	-	-	211.4	7.8	-	-
HCM Lane LOS	A	-	-	-	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-	18.4	0.1	-	-

Notes

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

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	92	13	19	283	38	89
Future Vol, veh/h	92	13	19	283	38	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	100	14	21	308	41	97

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	114	0	456	107
Stage 1	-	-	-	-	107	-
Stage 2	-	-	-	-	349	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1475	-	562	947
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	714	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1475	-	552	947
Mov Cap-2 Maneuver	-	-	-	-	552	-
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	702	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	780	-	-	1475	-
HCM Lane V/C Ratio	0.177	-	-	0.014	-
HCM Control Delay (s)	10.6	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Intersection	
Int Delay, s/veh	202.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	86	128	72	44	99	30	26	229	38	109	469	76
Future Vol, veh/h	86	128	72	44	99	30	26	229	38	109	469	76
Conflicting Peds, #/hr	6	0	4	4	0	6	12	0	4	4	0	12
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	50	-	-	50	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	93	139	78	48	108	33	28	249	41	118	510	83

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1202	1151	567	1231	1171	280	604	0	0	294	0	0
Stage 1	800	800	-	330	330	-	-	-	-	-	-	-
Stage 2	402	351	-	901	841	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	161	198	523	154	193	759	974	-	-	1268	-	-
Stage 1	379	397	-	683	646	-	-	-	-	-	-	-
Stage 2	625	632	-	333	380	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 68	172	516	~ 39	168	753	971	-	-	1262	-	-
Mov Cap-2 Maneuver	~ 68	172	-	~ 39	168	-	-	-	-	-	-	-
Stage 1	364	356	-	661	625	-	-	-	-	-	-	-
Stage 2	478	612	-	155	341	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 678	$ 521.3	0.8	1.4
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	971	-	-	133	98	1262	-	-
HCM Lane V/C Ratio	0.029	-	-	2.337	1.919	0.094	-	-
HCM Control Delay (s)	8.8	-	-	$ 678	$ 521.3	8.1	-	-
HCM Lane LOS	A	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	26.6	15.7	0.3	-	-

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

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	212	50	75	130	20	47
Future Vol, veh/h	212	50	75	130	20	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	230	54	82	141	22	51

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	285	0	562	258
Stage 1	-	-	-	-	258	-
Stage 2	-	-	-	-	304	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1277	-	488	781
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1277	-	454	781
Mov Cap-2 Maneuver	-	-	-	-	454	-
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	696	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	643	-	-	1277	-
HCM Lane V/C Ratio	0.113	-	-	0.064	-
HCM Control Delay (s)	11.3	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.2	-

Synchro™ Output - 2020 Background Traffic with McKinney-Cole Two-Way Conversion – Mitigation

HCM 2010 Signalized Intersection Summary

4: Cole (Two-Way) & Armstrong

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	61	24	15	266	6	48	190	6	29	302	101
Future Volume (veh/h)	24	61	24	15	266	6	48	190	6	29	302	101
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	0.99		0.99
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	26	66	26	16	289	7	52	207	7	32	328	110
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	122	260	87	73	403	9	621	1080	37	757	804	270
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.60	0.60	0.60	0.80	0.80	0.80
Sat Flow, veh/h	214	1130	380	43	1752	41	943	1791	61	1156	1332	447
Grp Volume(v), veh/h	118	0	0	312	0	0	52	0	214	32	0	438
Grp Sat Flow(s),veh/h/ln	1724	0	0	1836	0	0	943	0	1851	1156	0	1779
Q Serve(g_s), s	0.0	0.0	0.0	1.9	0.0	0.0	1.6	0.0	3.1	0.5	0.0	4.3
Cycle Q Clear(g_c), s	3.3	0.0	0.0	9.4	0.0	0.0	6.0	0.0	3.1	3.6	0.0	4.3
Prop In Lane	0.22		0.22	0.05		0.02	1.00		0.03	1.00		0.25
Lane Grp Cap(c), veh/h	470	0	0	485	0	0	621	0	1117	757	0	1073
V/C Ratio(X)	0.25	0.00	0.00	0.64	0.00	0.00	0.08	0.00	0.19	0.04	0.00	0.41
Avail Cap(c_a), veh/h	758	0	0	824	0	0	621	0	1117	757	0	1073
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.87	0.00	0.87
Uniform Delay (d), s/veh	19.0	0.0	0.0	21.4	0.0	0.0	7.0	0.0	5.3	3.1	0.0	2.8
Incr Delay (d2), s/veh	0.3	0.0	0.0	1.4	0.0	0.0	0.3	0.0	0.4	0.1	0.0	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	0.0	0.0	5.0	0.0	0.0	0.5	0.0	1.7	0.2	0.0	2.3
LnGrp Delay(d),s/veh	19.3	0.0	0.0	22.8	0.0	0.0	7.2	0.0	5.7	3.2	0.0	3.8
LnGrp LOS	B			C			A		A	A		A
Approach Vol, veh/h		118			312			266			470	
Approach Delay, s/veh		19.3			22.8			6.0			3.7	
Approach LOS		B			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		41.2		18.8		41.2		18.8
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		25.0		25.0		25.0		25.0
Max Q Clear Time (g_c+I1), s		8.0		5.3		6.3		11.4
Green Ext Time (p_c), s		4.3		2.5		4.4		2.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.9
HCM 2010 LOS	B

HCM 2010 TWSC

16: Driveway & Arstrong

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	91	0	0	281	0	0
Future Vol, veh/h	91	0	0	281	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	99	0	0	305	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	99	0	404	99
Stage 1	-	-	-	-	99	-
Stage 2	-	-	-	-	305	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1494	-	603	957
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1494	-	603	957
Mov Cap-2 Maneuver	-	-	-	-	603	-
Stage 1	-	-	-	-	925	-
Stage 2	-	-	-	-	748	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1494	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

HCM 2010 Signalized Intersection Summary

4: Cole (Two-Way) & Armstrong

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	122	71	30	98	22	26	223	13	88	458	75
Future Volume (veh/h)	85	122	71	30	98	22	26	223	13	88	458	75
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	0.99		0.99
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	92	133	77	33	107	24	28	242	14	96	498	82
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	174	199	101	121	316	63	608	1028	59	703	919	151
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.59	0.59	0.59	1.00	1.00	1.00
Sat Flow, veh/h	394	818	415	201	1298	257	827	1743	101	1113	1558	257
Grp Volume(v), veh/h	302	0	0	164	0	0	28	0	256	96	0	580
Grp Sat Flow(s),veh/h/ln	1627	0	0	1757	0	0	827	0	1844	1113	0	1814
Q Serve(g_s), s	5.6	0.0	0.0	0.0	0.0	0.0	0.9	0.0	4.0	0.7	0.0	0.0
Cycle Q Clear(g_c), s	10.1	0.0	0.0	4.5	0.0	0.0	0.9	0.0	4.0	4.6	0.0	0.0
Prop In Lane	0.30		0.25	0.20		0.15	1.00		0.05	1.00		0.14
Lane Grp Cap(c), veh/h	475	0	0	500	0	0	608	0	1087	703	0	1070
V/C Ratio(X)	0.64	0.00	0.00	0.33	0.00	0.00	0.05	0.00	0.24	0.14	0.00	0.54
Avail Cap(c_a), veh/h	743	0	0	780	0	0	608	0	1087	703	0	1070
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.50	0.00	0.50
Uniform Delay (d), s/veh	20.8	0.0	0.0	18.9	0.0	0.0	5.2	0.0	5.9	0.3	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.4	0.0	0.0	0.1	0.0	0.5	0.2	0.0	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	4.8	0.0	0.0	2.3	0.0	0.0	0.2	0.0	2.1	0.2	0.0	0.3
LnGrp Delay(d),s/veh	22.2	0.0	0.0	19.2	0.0	0.0	5.4	0.0	6.4	0.5	0.0	1.0
LnGrp LOS	C			B			A		A	A		A
Approach Vol, veh/h		302			164			284			676	
Approach Delay, s/veh		22.2			19.2			6.3			0.9	
Approach LOS		C			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		40.4		19.6		40.4		19.6
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		25.0		25.0		25.0		25.0
Max Q Clear Time (g_c+I1), s		6.0		12.1		6.6		6.5
Green Ext Time (p_c), s		6.1		2.4		6.0		2.8

Intersection Summary	
HCM 2010 Ctrl Delay	8.6
HCM 2010 LOS	A

HCM 2010 TWSC

16: Driveway & Arstrong

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	210	0	0	129	0	0
Future Vol, veh/h	210	0	0	129	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	228	0	0	140	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	228	0	368	228
Stage 1	-	-	-	-	228	-
Stage 2	-	-	-	-	140	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1340	-	632	811
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	887	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1340	-	632	811
Mov Cap-2 Maneuver	-	-	-	-	632	-
Stage 1	-	-	-	-	810	-
Stage 2	-	-	-	-	887	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1340	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Synchro™ Output - 2020 Background Plus Site Traffic with McKinney-Cole Two-Way Conversion – Mitigation

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	63	24	40	266	19	48	190	12	34	302	101
Future Volume (veh/h)	24	63	24	40	266	19	48	190	12	34	302	101
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	1.00		0.99	0.99		0.99
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	26	68	26	43	289	21	52	207	13	37	328	110
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	128	286	94	102	393	27	585	1002	63	719	770	258
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.58	0.58	0.58	0.77	0.77	0.77
Sat Flow, veh/h	215	1121	369	135	1541	106	943	1733	109	1149	1332	447
Grp Volume(v), veh/h	120	0	0	353	0	0	52	0	220	37	0	438
Grp Sat Flow(s),veh/h/ln	1705	0	0	1782	0	0	943	0	1842	1149	0	1778
Q Serve(g_s), s	0.0	0.0	0.0	5.3	0.0	0.0	1.8	0.0	3.4	0.6	0.0	5.1
Cycle Q Clear(g_c), s	3.2	0.0	0.0	10.9	0.0	0.0	6.9	0.0	3.4	4.1	0.0	5.1
Prop In Lane	0.22		0.22	0.12		0.06	1.00		0.06	1.00		0.25
Lane Grp Cap(c), veh/h	508	0	0	522	0	0	585	0	1065	719	0	1028
V/C Ratio(X)	0.24	0.00	0.00	0.68	0.00	0.00	0.09	0.00	0.21	0.05	0.00	0.43
Avail Cap(c_a), veh/h	758	0	0	804	0	0	585	0	1065	719	0	1028
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.87	0.00	0.87
Uniform Delay (d), s/veh	17.8	0.0	0.0	20.6	0.0	0.0	8.1	0.0	6.1	3.9	0.0	3.5
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.5	0.0	0.0	0.3	0.0	0.4	0.1	0.0	1.1
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	0.0	0.0	5.6	0.0	0.0	0.5	0.0	1.8	0.2	0.0	2.8
LnGrp Delay(d),s/veh	18.1	0.0	0.0	22.2	0.0	0.0	8.4	0.0	6.5	4.1	0.0	4.6
LnGrp LOS	B			C			A		A	A		A
Approach Vol, veh/h		120			353			272			475	
Approach Delay, s/veh		18.1			22.2			6.9			4.6	
Approach LOS		B			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		39.7		20.3		39.7		20.3
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		25.0		25.0		25.0		25.0
Max Q Clear Time (g_c+I1), s		8.9		5.2		7.1		12.9
Green Ext Time (p_c), s		4.2		2.9		4.4		2.3

Intersection Summary	
HCM 2010 Ctrl Delay	11.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	91	13	19	281	38	89
Future Vol, veh/h	91	13	19	281	38	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	99	14	21	305	41	97

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	113	0	453	106
Stage 1	-	-	-	-	106	-
Stage 2	-	-	-	-	347	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1476	-	565	948
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	716	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1476	-	555	948
Mov Cap-2 Maneuver	-	-	-	-	555	-
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	704	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	782	-	-	1476	-
HCM Lane V/C Ratio	0.177	-	-	0.014	-
HCM Control Delay (s)	10.6	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	85	128	71	43	98	29	26	223	38	107	458	75
Future Volume (veh/h)	85	128	71	43	98	29	26	223	38	107	458	75
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	1.00		0.99
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	92	139	77	47	107	32	28	242	41	116	498	82
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	174	208	101	143	281	72	605	909	154	674	913	150
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.59	0.59	0.59	1.00	1.00	1.00
Sat Flow, veh/h	389	841	410	274	1135	293	827	1551	263	1086	1558	257
Grp Volume(v), veh/h	308	0	0	186	0	0	28	0	283	116	0	580
Grp Sat Flow(s),veh/h/ln	1640	0	0	1702	0	0	827	0	1813	1086	0	1814
Q Serve(g_s), s	4.9	0.0	0.0	0.0	0.0	0.0	0.9	0.0	4.6	1.0	0.0	0.0
Cycle Q Clear(g_c), s	10.1	0.0	0.0	5.2	0.0	0.0	0.9	0.0	4.6	5.6	0.0	0.0
Prop In Lane	0.30		0.25	0.25		0.17	1.00		0.14	1.00		0.14
Lane Grp Cap(c), veh/h	483	0	0	496	0	0	605	0	1063	674	0	1064
V/C Ratio(X)	0.64	0.00	0.00	0.38	0.00	0.00	0.05	0.00	0.27	0.17	0.00	0.55
Avail Cap(c_a), veh/h	746	0	0	761	0	0	605	0	1063	674	0	1064
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.50	0.00	0.50
Uniform Delay (d), s/veh	20.7	0.0	0.0	19.0	0.0	0.0	5.3	0.0	6.1	0.4	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.5	0.0	0.0	0.1	0.0	0.6	0.3	0.0	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	4.9	0.0	0.0	2.6	0.0	0.0	0.2	0.0	2.5	0.3	0.0	0.3
LnGrp Delay(d),s/veh	22.1	0.0	0.0	19.4	0.0	0.0	5.5	0.0	6.7	0.6	0.0	1.0
LnGrp LOS	C			B			A		A	A		A
Approach Vol, veh/h		308			186			311			696	
Approach Delay, s/veh		22.1			19.4			6.6			0.9	
Approach LOS		C			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		40.2		19.8		40.2		19.8
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		25.0		25.0		25.0		25.0
Max Q Clear Time (g_c+I1), s		6.6		12.1		7.6		7.2
Green Ext Time (p_c), s		6.3		2.6		6.1		3.0

Intersection Summary	
HCM 2010 Ctrl Delay	8.7
HCM 2010 LOS	A

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	210	50	75	129	20	47
Future Vol, veh/h	210	50	75	129	20	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	228	54	82	140	22	51

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	283	0	558	255
Stage 1	-	-	-	-	255	-
Stage 2	-	-	-	-	303	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1279	-	491	784
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	749	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1279	-	457	784
Mov Cap-2 Maneuver	-	-	-	-	457	-
Stage 1	-	-	-	-	788	-
Stage 2	-	-	-	-	697	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	646	-	-	1279	-
HCM Lane V/C Ratio	0.113	-	-	0.064	-
HCM Control Delay (s)	11.3	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.2	-

Synchro™ Output - 2025 Background Traffic with McKinney-Cole Two-Way Conversion – Mitigation

HCM 2010 Signalized Intersection Summary

4: Cole (Two-Way) & Armstrong

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	62	24	16	268	6	49	194	6	30	309	101
Future Volume (veh/h)	24	62	24	16	268	6	49	194	6	30	309	101
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	0.99		0.99
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	26	67	26	17	291	7	53	211	7	33	336	110
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	122	263	87	74	405	9	613	1078	36	752	807	264
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.60	0.60	0.60	0.80	0.80	0.80
Sat Flow, veh/h	212	1136	377	46	1748	41	937	1792	59	1152	1341	439
Grp Volume(v), veh/h	119	0	0	315	0	0	53	0	218	33	0	446
Grp Sat Flow(s),veh/h/ln	1725	0	0	1834	0	0	937	0	1852	1152	0	1780
Q Serve(g_s), s	0.0	0.0	0.0	2.1	0.0	0.0	1.7	0.0	3.2	0.5	0.0	4.5
Cycle Q Clear(g_c), s	3.3	0.0	0.0	9.5	0.0	0.0	6.2	0.0	3.2	3.7	0.0	4.5
Prop In Lane	0.22		0.22	0.05		0.02	1.00		0.03	1.00		0.25
Lane Grp Cap(c), veh/h	473	0	0	488	0	0	613	0	1114	752	0	1071
V/C Ratio(X)	0.25	0.00	0.00	0.65	0.00	0.00	0.09	0.00	0.20	0.04	0.00	0.42
Avail Cap(c_a), veh/h	759	0	0	823	0	0	613	0	1114	752	0	1071
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.87	0.00	0.87
Uniform Delay (d), s/veh	19.0	0.0	0.0	21.3	0.0	0.0	7.1	0.0	5.4	3.2	0.0	2.8
Incr Delay (d2), s/veh	0.3	0.0	0.0	1.4	0.0	0.0	0.3	0.0	0.4	0.1	0.0	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	1.7	0.0	0.0	5.0	0.0	0.0	0.5	0.0	1.8	0.2	0.0	2.5
LnGrp Delay(d),s/veh	19.2	0.0	0.0	22.8	0.0	0.0	7.4	0.0	5.8	3.3	0.0	3.9
LnGrp LOS	B			C			A		A	A		A
Approach Vol, veh/h		119			315			271			479	
Approach Delay, s/veh		19.2			22.8			6.1			3.8	
Approach LOS		B			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		41.1		18.9		41.1		18.9
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		25.0		25.0		25.0		25.0
Max Q Clear Time (g_c+I1), s		8.2		5.3		6.5		11.5
Green Ext Time (p_c), s		4.3		2.6		4.5		2.2

Intersection Summary	
HCM 2010 Ctrl Delay	10.9
HCM 2010 LOS	B

HCM 2010 TWSC

16: Driveway & Arstrong

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	92	0	0	283	0	0
Future Vol, veh/h	92	0	0	283	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	100	0	0	308	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	100	0	408	100
Stage 1	-	-	-	-	100	-
Stage 2	-	-	-	-	308	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1493	-	599	956
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	745	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1493	-	599	956
Mov Cap-2 Maneuver	-	-	-	-	599	-
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	745	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1493	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

HCM 2010 Signalized Intersection Summary

4: Cole (Two-Way) & Armstrong

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	122	72	31	99	23	26	229	13	90	469	76
Future Volume (veh/h)	86	122	72	31	99	23	26	229	13	90	469	76
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	0.99		0.99
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	93	133	78	34	108	25	28	249	14	98	510	83
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	176	199	102	122	315	64	601	1027	58	695	918	149
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.59	0.59	0.59	1.00	1.00	1.00
Sat Flow, veh/h	397	813	417	205	1286	262	817	1746	98	1106	1561	254
Grp Volume(v), veh/h	304	0	0	167	0	0	28	0	263	98	0	593
Grp Sat Flow(s),veh/h/ln	1627	0	0	1753	0	0	817	0	1844	1106	0	1815
Q Serve(g_s), s	5.5	0.0	0.0	0.0	0.0	0.0	0.9	0.0	4.1	0.7	0.0	0.0
Cycle Q Clear(g_c), s	10.1	0.0	0.0	4.6	0.0	0.0	0.9	0.0	4.1	4.8	0.0	0.0
Prop In Lane	0.31		0.26	0.20		0.15	1.00		0.05	1.00		0.14
Lane Grp Cap(c), veh/h	477	0	0	502	0	0	601	0	1085	695	0	1068
V/C Ratio(X)	0.64	0.00	0.00	0.33	0.00	0.00	0.05	0.00	0.24	0.14	0.00	0.56
Avail Cap(c_a), veh/h	743	0	0	779	0	0	601	0	1085	695	0	1068
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.50	0.00	0.50
Uniform Delay (d), s/veh	20.8	0.0	0.0	18.8	0.0	0.0	5.3	0.0	5.9	0.3	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.4	0.0	0.0	0.1	0.0	0.5	0.2	0.0	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	4.8	0.0	0.0	2.3	0.0	0.0	0.2	0.0	2.2	0.2	0.0	0.3
LnGrp Delay(d),s/veh	22.2	0.0	0.0	19.2	0.0	0.0	5.4	0.0	6.5	0.5	0.0	1.0
LnGrp LOS	C			B			A		A	A		A
Approach Vol, veh/h		304			167			291			691	
Approach Delay, s/veh		22.2			19.2			6.4			1.0	
Approach LOS		C			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		40.3		19.7		40.3		19.7
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		25.0		25.0		25.0		25.0
Max Q Clear Time (g_c+I1), s		6.1		12.1		6.8		6.6
Green Ext Time (p_c), s		6.2		2.4		6.1		2.8

Intersection Summary	
HCM 2010 Ctrl Delay	8.6
HCM 2010 LOS	A

HCM 2010 TWSC

16: Driveway & Arstrong

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	212	0	0	130	0	0
Future Vol, veh/h	212	0	0	130	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	230	0	0	141	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	230	0	371	230
Stage 1	-	-	-	-	230	-
Stage 2	-	-	-	-	141	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1338	-	630	809
Stage 1	-	-	-	-	808	-
Stage 2	-	-	-	-	886	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1338	-	630	809
Mov Cap-2 Maneuver	-	-	-	-	630	-
Stage 1	-	-	-	-	808	-
Stage 2	-	-	-	-	886	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	1338	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Synchro™ Output - 2025 Background Plus Site Traffic with McKinney-Cole Two-Way Conversion – Mitigation

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	64	24	41	268	19	49	194	12	35	309	101
Future Volume (veh/h)	24	64	24	41	268	19	49	194	12	35	309	101
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		0.99	1.00		0.99	0.99		0.99
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	26	70	26	45	291	21	53	211	13	38	336	110
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	127	292	94	104	395	27	577	999	62	712	772	253
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.58	0.58	0.58	0.77	0.77	0.77
Sat Flow, veh/h	210	1133	364	141	1533	105	937	1736	107	1145	1341	439
Grp Volume(v), veh/h	122	0	0	357	0	0	53	0	224	38	0	446
Grp Sat Flow(s),veh/h/ln	1707	0	0	1779	0	0	937	0	1843	1145	0	1780
Q Serve(g_s), s	0.0	0.0	0.0	5.5	0.0	0.0	1.8	0.0	3.5	0.7	0.0	5.3
Cycle Q Clear(g_c), s	3.3	0.0	0.0	11.1	0.0	0.0	7.1	0.0	3.5	4.2	0.0	5.3
Prop In Lane	0.21		0.21	0.13		0.06	1.00		0.06	1.00		0.25
Lane Grp Cap(c), veh/h	513	0	0	526	0	0	577	0	1061	712	0	1025
V/C Ratio(X)	0.24	0.00	0.00	0.68	0.00	0.00	0.09	0.00	0.21	0.05	0.00	0.44
Avail Cap(c_a), veh/h	759	0	0	803	0	0	577	0	1061	712	0	1025
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.87	0.00	0.87
Uniform Delay (d), s/veh	17.7	0.0	0.0	20.6	0.0	0.0	8.4	0.0	6.2	4.0	0.0	3.6
Incr Delay (d2), s/veh	0.2	0.0	0.0	1.5	0.0	0.0	0.3	0.0	0.5	0.1	0.0	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	1.6	0.0	0.0	5.7	0.0	0.0	0.5	0.0	1.9	0.2	0.0	2.8
LnGrp Delay(d),s/veh	18.0	0.0	0.0	22.1	0.0	0.0	8.7	0.0	6.6	4.2	0.0	4.8
LnGrp LOS	B			C			A		A	A		A
Approach Vol, veh/h		122			357			277			484	
Approach Delay, s/veh		18.0			22.1			7.0			4.7	
Approach LOS		B			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		39.5		20.5		39.5		20.5
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		25.0		25.0		25.0		25.0
Max Q Clear Time (g_c+I1), s		9.1		5.3		7.3		13.1
Green Ext Time (p_c), s		4.3		2.9		4.5		2.3

Intersection Summary	
HCM 2010 Ctrl Delay	11.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	92	13	19	283	38	89
Future Vol, veh/h	92	13	19	283	38	89
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	100	14	21	308	41	97

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	114	0	456	107
Stage 1	-	-	-	-	107	-
Stage 2	-	-	-	-	349	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1475	-	562	947
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	714	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1475	-	552	947
Mov Cap-2 Maneuver	-	-	-	-	552	-
Stage 1	-	-	-	-	917	-
Stage 2	-	-	-	-	702	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	10.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	780	-	-	1475	-
HCM Lane V/C Ratio	0.177	-	-	0.014	-
HCM Control Delay (s)	10.6	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0	-

HCM 2010 Signalized Intersection Summary

4: Cole (Two-Way) & Armstrong

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	128	72	44	99	30	26	229	38	109	469	76
Future Volume (veh/h)	86	128	72	44	99	30	26	229	38	109	469	76
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	1.00		0.99
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
Adj Sat Flow, veh/h/ln	1900	1863	1900	1900	1863	1900	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	93	139	78	48	108	33	28	249	41	118	510	83
Adj No. of Lanes	0	1	0	0	1	0	1	1	0	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	175	208	102	144	280	74	598	911	150	666	913	149
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.58	0.58	0.58	1.00	1.00	1.00
Sat Flow, veh/h	392	836	413	276	1126	296	817	1558	257	1080	1561	254
Grp Volume(v), veh/h	310	0	0	189	0	0	28	0	290	118	0	593
Grp Sat Flow(s),veh/h/ln	1640	0	0	1698	0	0	817	0	1814	1080	0	1815
Q Serve(g_s), s	4.9	0.0	0.0	0.0	0.0	0.0	0.9	0.0	4.7	1.1	0.0	0.0
Cycle Q Clear(g_c), s	10.2	0.0	0.0	5.3	0.0	0.0	0.9	0.0	4.7	5.8	0.0	0.0
Prop In Lane	0.30		0.25	0.25		0.17	1.00		0.14	1.00		0.14
Lane Grp Cap(c), veh/h	485	0	0	497	0	0	598	0	1061	666	0	1062
V/C Ratio(X)	0.64	0.00	0.00	0.38	0.00	0.00	0.05	0.00	0.27	0.18	0.00	0.56
Avail Cap(c_a), veh/h	746	0	0	760	0	0	598	0	1061	666	0	1062
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	0.50	0.00	0.50
Uniform Delay (d), s/veh	20.6	0.0	0.0	18.9	0.0	0.0	5.4	0.0	6.2	0.4	0.0	0.0
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.5	0.0	0.0	0.1	0.0	0.6	0.3	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	0.0	0.0	2.7	0.0	0.0	0.2	0.0	2.5	0.3	0.0	0.3
LnGrp Delay(d),s/veh	22.0	0.0	0.0	19.4	0.0	0.0	5.5	0.0	6.8	0.7	0.0	1.1
LnGrp LOS	C			B			A		A	A		A
Approach Vol, veh/h		310			189			318			711	
Approach Delay, s/veh		22.0			19.4			6.7			1.0	
Approach LOS		C			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		40.1		19.9		40.1		19.9
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		25.0		25.0		25.0		25.0
Max Q Clear Time (g_c+I1), s		6.7		12.2		7.8		7.3
Green Ext Time (p_c), s		6.4		2.6		6.2		3.0

Intersection Summary	
HCM 2010 Ctrl Delay	8.7
HCM 2010 LOS	A

HCM 2010 TWSC

16: Driveway & Arstrong

Intersection	
Int Delay, s/veh	2.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	212	50	75	130	20	47
Future Vol, veh/h	212	50	75	130	20	47
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	230	54	82	141	22	51

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	285	0	562	258
Stage 1	-	-	-	-	258	-
Stage 2	-	-	-	-	304	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1277	-	488	781
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1277	-	454	781
Mov Cap-2 Maneuver	-	-	-	-	454	-
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	696	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.9	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	643	-	-	1277	-
HCM Lane V/C Ratio	0.113	-	-	0.064	-
HCM Control Delay (s)	11.3	-	-	8	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.4	-	-	0.2	-